N

N,N-Dimethyltryptamine (DMT)

► Psychedelic Drugs and Personality

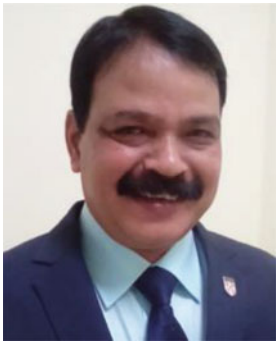
N=1

► Idiographic Study of Personality

Nagle, Yashwant Kumar

Yashwant Kumar Nagle[1], Himani Singh[2] and Neelesh Nagle[2]
[1]Defence Institute of Psychological Research, DRDO, Delhi, New Delhi, India
[2]University of Delhi, Delhi, India

Biography of Yashwant Kumar Nagle, Ph.D.



Introduction

Yashwant Kumar Nagle was born in Borgaon, a village located about 26 km south of Betul City, on January 05, 1962. Borgaon is located in Bhainsdehi Tehsil, Betul District of Madhya Pradesh, India. His father Mr. Ramlal Nagle was a school teacher, son of a farmer, and his mother is the daughter of a landlord. Yashwant is the second eldest of four children born to Ramlal and Kasturi Nagle. He grew up in a rural village close to the natural surroundings, with an avid interest in individual and surroundings along with interest in folk dance, music, and tribal literature. His early schooling was done in neighboring village Layawani which is located about 2.5 km toward east of his residing village, in a very small school where Mr. Ramlal, his father, was the first teacher who taught him not only language, mathematics, social science, and discipline but also shaped his entire personality. After successful completion of primary education he went for Middle School Education at Zhallar, a town 7 km away from the village, Borgaon. He did his higher secondary education from New Betul Higher Secondary School, Kothi Bazar, Betul, Madhya Pradesh, India, in the year 1978.

Educational Background

After completion of his school education, he was accepted for Bachelor of Arts degree program at

V. Zeigler-Hill, T. K. Shackelford (eds.), *Encyclopedia of Personality and Individual Differences*,
https://doi.org/10.1007/978-3-319-24612-3

Government Hamidia Arts and Commerce College, Bhopal University, Bhopal, India, in the year 1978 with major subjects being Psychology, Geography, and Political Science. Since his childhood, he was always curious about the rationale behind other fellow human being's behavior and the way they behave and act in different situations. This curiosity developed his further interest in studying Psychology, and he elected Psychology as one of the major subjects in pursuing his degree. Yashwant modestly dedicates all his achievements to his mentor, the first teacher of Psychology, Prof. Babi Dutta. She was young, enthusiastic, and a highly knowledgeable teacher, who introduced him to the basics of Psychology, taking long hours of teaching beyond classroom sessions and explaining each and every concept of General Psychology and Developmental Psychology during the initial phase of his graduation. Overall, there were nine students in the first year of BA course who took Psychology as major discipline. However, only three students continued, and the rest six students left Psychology being a tough subject. This was a tough decision for him as well, and even he got inclined toward changing the discipline; however, due to Prof. Babi Dutta's enthusiasm, motivation, and encouraging nature, the decision was relatively easier. Once during her lectures she made a special mention, (if you want learn Psychology then you should be regular; it is not like any other subject that you can study on your own). Those words of professor had a profound impact on his young mind and inspired him to not only study Psychology very sincerely but also inspirited within him a pursuit of Doctorate in Psychology after completion of Masters' in Psychology as the goal was obvious. After completing his Bachelor's degree in 1981, he enrolled for postgraduate in Psychology at Department of Psychology, Devi Ahilya University, Indore, in the year 1981, where he had been a student to excellent teachers like Professor Usha Krishanan, Professor Ashok Jain, Professor Ramesh Sanghi, Professor Manju Shukla, and Professor Saroj Kothari. At the university, he became au courant of various subdisciplines of Psychology during his master program like Psychophysics and Learning, Social Psychology, Research Methods and Statistics, Advanced Psychopathology, Industrial and Personnel Psychology, Psychometric Methods, Counselling Psychology, and Neuropsychology. In addition to the above subdisciplines and theories related to them, he was also tested for his practical brilliance and application in Experimental Psychology, Psychometric Testing, and Projective Methods. He successfully completed his Masters' in Psychology in the year 1983.

After completion of his postgraduation in 1983, his parents were expecting him to find a job, as his father was the only earning member in the family. His father's possession of a small piece of agricultural land and profession as a school teacher resulted in meager earnings to cater the monetary requirements of the family, and two younger brothers were also studying in college and university. That was a difficult time for his father to support all the children for their higher education; hence he was compelled into extending monetary support to his family through regular employment and earning, for around 2 years. Fortunately though, he did not get a respectable job during that period in accordance with his personal passion and satisfaction, as a result he was quite upset and miserable. His pursuit for a Doctorate in the field of Psychology finally leads him to enlist for Ph.D. degree in April 1985 and started working on the topic "differences in attitude toward nonviolence, creativity, and conformity of tribal and non-tribal students" under supervision of Professor US Chaudhari, a renowned educationist of the country, at School of Education, Devi Ahilya Vishwavidyalaya, Indore. The topic was very important and the need of the prevailing situation in the country, as at that point of time communal violence was spreading all over the northern part of India, especially in Punjab and Uttar Pradesh after the assassination of Smt Indira Gandhi, the former Prime Minister of India, in October 1984.

Main focus of Doctoral work was to develop a scale for assessment of attitude toward nonviolence for adolescents and written communication message for changing violent attitude of adolescents based on the Gandhian principle. Further study was also focused on exploring the relationship between nonviolence, creativity, and

conformity and also to find out the gender differences on study variables. The work was quite challenging, and he had to collect data from various schools of rural and tribal area located in remote areas of Madhya Pradesh, India.

The scale was developed based on Gandhian principles of nonviolence covering eight dimensions of Gandhian personality, i.e., love, peace, truth, fearlessness, self-control, humility, tolerance, and equality. Initially 148 items were developed which include 82 positive and 66 negative items. The scale was rated on five-point scale ranging from strongly agree to strongly disagree. After item analysis, inconsistency of items, and internal consistencies of items, finally 75 items were retained (viz., 37 positive and 38 negative). Further the reliability and validity were also established, and the test was found to be psychometrically sound enough to assess the attitude toward nonviolence among adolescents. Finally the scale was published in the year 1996 by Rupa Psychological Corp, Varanasi, India, and has been used by various researchers for their master and doctoral programs.

The main focus of Ph.D. research was to develop written communication favoring attitude toward nonviolence. The concept of nonviolence has been confined to the eight dimensions of Gandhian principal, i.e., love, peace, truth, fearlessness, self-control, humility, tolerance, and equality. The communication message was designed in such a way that would cover abovementioned dimension referring to attitude change toward nonviolence of adolescents. The theme of communication was enthused from various sources, viz., short stories and essays from moral stories of Indian literature "Ahinsa Kranti ki Prakriya, Sheshta kahaniya, Ahinsa ke anubhav, bhramcharya, ashram vaani, baapu see seekho, gandhji k pawan prasang, satya ki khoj, hinsa se pare, sarvodya tatva darshan, bhavya ekanti, gyaan sarovar, swarg bhoomi ki lok kathaaye, aath-paath nagar ki kahaaniya, jinn-wani, panch-antantra, naytik vikas." The students were assessed before and after the intervention, i.e., communication message. The written form of communication favoring attitude toward nonviolence was finally developed.

The experiments were conducted on students for attitude toward nonviolence using four group experimental designs for study of attitude change toward nonviolence. The 43 stories in the form of written communication favoring attitude toward nonviolence were prepared. The communication message was given to the experimental group and control group No 2 for a period of 30–40 min in the form of written script per day which continued over a period of 12 days. After the intervention, participants were further tested on attitude toward nonviolence to observe the changes and effects regarding attitude toward nonviolence. The result of this experiment portrayed that the pretested group has been found to be having higher score on attitude toward nonviolent scale than the non-pretested group. These findings suggest that the pretested group got sensitized as results of the administration of attitude toward nonviolent scale; however, the written communication provided to the participants could not effect change toward nonviolence in the attitude of adolescent, though their mean score on attitude toward nonviolent scale was higher but was not significant.

Further the finding of the study revealed that higher-caste and female students were found to be superior to tribal students and male on verbal creativity. The score on nonverbal creativity was similar in both the groups, i.e., higher castes and tribal students. High-caste students were having higher score on attitude toward nonviolence than tribal students. Female students were having higher score on attitude toward nonviolence than male students. The score on confirmative behavior of both groups was similar; however, female scored higher as compared to male students. Negative relationship was found between creativity and nonviolence and creativity and conformity; however, positive relationship was observed between conformity and nonviolence (Nagle 1991). The Doctoral Fellowship was awarded for significant contribution for his Ph.D. research by Indian Council of Social Science Research, New Delhi, in the year 1988. Finally the Doctoral Degree in Applied Psychology was awarded in year July 1991 from Devi Ahilya Vishwavidyalaya, Indore, India.

Profession and Research Interests

Yashwant later joined Reorientation Training Centre Jashpur Nagar, Madhya Pradesh, India, on July 01, 1988 as Lecturer of Psychology. At the training center he was sharing a major load of theoretical instructions by delivering lectures and practical demonstration on the wide area of Developmental Psychology and Educational Psychology to the teachers' trainees. He was also entrusted with other assignments like population education program, and adult education program in rural areas; besides being an active part of this, he was also actively participating and guiding teachers' trainee on cultural and extracurricular activities. At the training center, he also became the founder editor of the institute's magazine *Prerna*. During a short tenure of even less than 5 years, he created a highly energetic, dedicated, and committed image as a faculty member. He left this institute on September 30, 1992 and joined as a psychologist at Vocational Rehabilitation Centre for Handicapped, Patna, India, on March 10, 1993. As a psychologist he was leading evaluation and training division and also assisting in placement activities and other administrative work in the institute. During the period of about 18 months he developed deep interest in the area of academic and research activities on personality assessment and counselling. He left this center on October 30, 1994 and joined Services Selection Board, as Scientist "B" (psychologist), under the Defence Research and Development Services, Ministry of Defence, Government of India, at Bangalore on November 11, 1994. His assignment was to carry out personality assessment for selection of commissioned officers for the Indian Armed Forces through various projective techniques.

Currently he is working as a Scientist "F" at Defence Institute of Psychological Research, Defence Research and Development Organisation, Ministry of Defence, Government of India. India, and actively involved in various research projects in the area of personnel selection, training of assessors on projective techniques, personality assessment, and development of various personality tests. His research focuses on development and validation of personality test for personnel selection for armed forces and civil organization, personality assessment, counselling, and psychotherapy.

Major Contribution to Study of Personality and Individual Differences

Handbook of Forensic Psychology (Nagle et al. 2014 Eds)

The handbook is about the theoretical foundations, researches in forensic psychology, practices, and applications in forensic settings. This handbook is divided into three parts: the first part of the book addresses the theoretical foundations of forensic psychology, comprising behavioral biometrics, forensic assessment, criminal behavior, and overview of psychopathy. The forensic examination of suspects and the third part of the book address the issues related to forensic practices and their application.

Development and Validation of Nonviolent Attitude Scale (Nagle 1996)

The scale was developed based on Gandhian principles of nonviolence covering eight dimensions of Gandhian personality, i.e., love, peace, truth, fearlessness, self-control, humility, and equality. Initially 148 items were developed which include 82 positive and 66 negative items. The scale was rated on a five-point scale ranging from strongly agree to strongly disagree. After doing psychometric analysis, i.e., item analysis, inconsistency of items, internal consistency of items, finally 75 items were retained (viz., 37 positive and 38 negative). Further the reliability and validity of the test were also established, and the test was found to be psychometrically sound enough to assess the attitude toward nonviolence among adolescents.

Sound Apperception Test: Development and Validation (Nagle and Rani 2015)

The test was developed as Sound Apperception Test (SAT) measuring personality using an alternative, auditory form of projective testing. Sound effects designed to measure four personality

dimensions, viz., intellectual functioning, interpersonal adjustment, task orientation, and emotional embeddedness, were created. Stimulus analysis was carried out on a randomly drawn sample of 440 adults. Twenty four out of the 60 sound effects had more than 75% consensus among expert ratters and were retained. Six of the 18 sound effects were common for males and females, and six each were gender specific. The test-retest reliability for males was 0.692–0.765, and for females it was 0.644–0.841. The validity for males was 0.652–0.691, and for females it was 0.675–0.71.

Development of Pictorial Situational Judgment Test of Affect (Sharma and Nagle 2015)

Personality and emotion theories conceptualize the affect which refers to differences in how an individual responses to subjective aspect of emotional and motivational states as well as the processes. Prior researches have explored the dynamics of momentary emotional experiences by situational process and the enduring dispositional differences in study of traits. The current study was aimed at developing pictorial situational judgment test (P-SJT), based on a semi-projective approach for assessment of affect. Initially a pool of 100 items covering positive affect and negative affect dimension was developed based on critical incidents obtained from male and female college-going students of India. The 60-item P-SJT was evaluated with content validity. The article emphasizes the developmental procedure of pictorial situational judgment test of affect, and the P-SJT should be useful for the researchers interested in investigating individual differences in identifying emotional states and traits. Limitations and directions for future research are also addressed.

Spirituality Scale: Development and Validation (Purushottaman et al. 2015)

The genesis of spirituality is challenging due to a wide variety of perspectives and assumptions underlying spirituality research. Spirituality is still an emerging concept in the developing countries such as India, although rich culture has enriched in the past. Confining to various definitions of spirituality, the study attempts to evolve a health-oriented spirituality scale in an Indian context. With exploration of literature and expert reviews, various attributes of spirituality scale were initiated with a pool of 120 items. These items were subjected to experts' opinion and were reduced to 77. The version I scale was then administered on a sample of 254 participants. After initial factor analyses, the scale was again administered on a sample of 104 participants. Principal component analyses were employed, and 56 items were retained covering five factors for final version of spirituality scale. The reliability was 0.640, and validity was 0.491.

Development and Validation of Perfectionism Scale for Indian Adults (Anand and Nagle 2016)

There are varieties of definitions of perfectionism owing to diverse conceptualizations as understood by different researchers based on culture. Perfectionism can be defined as striving for or the tendency to maintain or to reach unreasonably high standards. Perfection is an emerging construct in India. Confining to the various definitions of perfectionism, the present study endeavors to evolve a perfectionism scale for youth in the Indian context since India has a culture very different from the countries where existing scales were developed. Based on Hewitt and Fletts' perfectionism model and expert reviews, various attributes of perfectionism scale were initiated with a pool of 129 items. These items were subjected to subject matter experts' opinion and reduced to 93. The scale was administered on a sample of 531 participants, and the item analysis was carried out, and the items having a value of 0.40 and above were retained for factor analysis. After initial factor analyses, the scale was again administered on a sample of 281 participants. The principal component analyses were employed, and 41 items were retained covering three factors, i.e., self-oriented perfectionism, socially prescribed perfectionism, and others-oriented perfectionism. The measure demonstrated high internal consistency; the reliability was 0.896, and validity was 0.486.

Development and Validation of Religious Belief System Scale (Dangi and Nagle 2016)

The literature cites multiple definitions for religiosity, with little consensus among researchers. Religiosity has been associated with a myriad of positive outcomes in both adolescents and adults. Religiosity refers to the degree to which a person adheres to his or her religious values, beliefs, and practices and uses them in daily life. Religiosity is still an emerging concept in the developing countries such as India, though rich culture has enriched in the past. Confining to various definitions of religiosity, the study attempts to evolve a religious belief system scale in an Indian context. With exploration of literature and expert reviews, various attributes of belief system scale was initiated with a pool of 164 items. These items were subjected to experts' opinion and reduced to 136. The scale was administered on a sample of 456 participants, and the item analysis was carried out; the items having more than 0.35 and above value were retained for factor analysis. After initial factor analyses the scale was again administered on a sample of 550 participants. The principal component analyses were employed, and 48 items were retained covering three factor, i.e., belief, attitude, and values. The measure demonstrated high internal consistency and good test-retest reliability as well as validity.

Pictorial Situational Judgment Test of Personality: Development and Validation (Nagle and Rani 2016)

The Big Five constructs have emerged as prominent determinants of personality assessment; however minimal research and practice have been done in the Indian military context. The present is a possible exploration of personality assessments of Big Five constructs through pictorial situational judgment test (P-SJT-P) with robust psychometric properties. A three-phase study was conducted on military job aspirants, phase-I 254, Phase-II 178, Phase-III 478, respectively, with the age range of 18–25 years. Initially 117P-SJT-P scenarios with four responses alternative based on critical incidents and interviews were developed. Participants responded to the appropriateness of each P-SJT-P and completed the NEO-PI-R personality inventory and face validity questionnaire. Further the P-SJT-P was subjected to factor analysis, where the finding emerged as five-factor model as priori construct. Associations between P-SJT-P and NEO-PI-R and SSBs and AFSBs performances were examined using Pearson's correlation and descriptive statistics. P-SJT-P Cronbach's alpha reliability ranged from 0.54 to 0.69. Statistically significant correlation indicating a significant relationship was observed between P-SJT-P and NEO-PI-R (0.39–0.53) and SSBs and AFSBs performance (0.48). The final P-SJT-P test consists of 50 items (written and achromatic pictures). The initial findings encouraging regarding the psychometric robustness of five factor based P-SJT-P for military personnel selection. Results suggest that carefully validated P-SJT-Ps may be used along with other psychometrically sound measures for personnel selection purposes.

Selected Publications

Books

Nagle Y.K, Srivastava, K., & Gupta, A. (2014 Ed). *Handbook of Forensic Psychology.* Bloomington, IN, USA: Author House, UK, Ltd.

Book Chapters

Nagle, Y.K. (2007). Correlates of Emotional Creativity. In Pradhan, Rabindra Kumar & Mathur Purnima (Eds) *Emotional Intelligence: Perspectives in Organisations* (pp. 130–157). Delhi: Academic Excellence Pvt. Ltd.

Nagle, Y.K. (2014). Forensic Assessment of Criminal Behaviour: Thematic Apperception Test and Sound Apperception Test protocols. In Nagle Y.K. Srivatava, K. & Gupta A. (Eds). *Handbook of Forensic Psychology* (pp. 263–291). Bloomington, IN, USA: Author House, UK, Ltd.

Nagle, Y.K. & Pusushottaman, T. (2014). Sexual Abuse and Violence. In Nagle Y.K., Srivatava, Kalpana & Gupta Arunima (Eds). *Handbook of Forensic Psychology* (pp. 490–506). Bloomington, IN, USA: Author House, UK, Ltd.

Kaur, Gurpreet, & Nagle, Y.K. (2014). Criminal Behavior: Emotional and Motivational Intent. In Nagle YK, Srivatava, K & Gupta A (Eds). *Handbook of Forensic Psychology* (pp. 103–118). Bloomington, IN, USA: Author House, UK, Ltd.

Psychological Test

Nagle, Y.K. (1996). *Non-violent Attitude scale and Manual*. Varanasi: Rupa Psychological Centre, India.

Journal Articles

Nagle, Y.K. (1994). Cultural differences in conformity among tribal and non-tribal *Journal of Social and Economic Studies*, *11,* 109–117.

Nagle, Y.K., Prakash, J., & Singh, A.R. (2006). Effectiveness of Cognitive Behaviuor Therapy to narcotic drug dependent Individuals. *Indian Journal of Clinical Psychology, 33*,(2),114–121.

Nagle, Y.K., & Pal, R. (2008). Stability of Vocational Interests among Male and Female students. *Journal of Indian Education, 33,* (2), 108–115.

Nagle, Y.K., Rani, K.E., Indubala & Pradhan, J. (2009). Stress and its relation to alcohol intake among military personnel. *Indian Journal of Preventive & Social Medicine.40,* (1 & 2), 23–33.

Anand, K., Nagle, Y.K., Misra, N., & Dangi, S. (2013). Influence of Organizational Role Stress on Perceived Burnout among Military Aircrew. *International Journal of Scientific and Research Publication. 3,* (2), 2250–3153.

Sharma, N., & Nagle, Y.K. (2015). Development of Pictorial Situational Judgement Test of Affect. *Psychology, 6*, (4),400–408.

Dangi, S., & Nagle, Y. K. (2015). Personality factors as determinants of psychological well being among adolescents. *Indian Journal of Health & Wellbeing*, *6*, (4),369–373.

Purushothaman, T., Pradhan, J., Nagle, Y.K., & Anand, K. (2015). Spirituality Scale: Development and Validation. *Journal of Advanced Research in Medical Science and Technology. 2,* (2), 1–10.

Ganjendran, P., & Nagle, Y.K. (2015). Gender Differences in Emotional Competency and Self-Efficiency among Indian Job Aspirants. *British Journal of Medical and Health Research. 2,* 9, 25–35.

Anand, K., & Nagle, Y.K. (2016). Development and Validation of Perfectionism Scale for Indian Adults. *International Journal of Psychology and Behavioral Sciences,6*,(5),206–212.

Anand, K. & Nagle, Y.K. (2016). Perfectionism as Predictor of Psychological Well-Being among college students. *Global Journal of Human-Social Science: A Arts & Humanities-Psychology 16,* (5), 1–0.,34–39.

Anand K & Nagle YK (2016). Perceived Stress as Predictor of Psychological Well-Being among Indian Youth. *The International Journal of Indian Psychology, 3,* (4),68, 211–217.

Dangi, S., & Nagle, Y.K. (2016). Development and Validation of Religious Systems Scale. *The International Journal of Indian Psychology. 3*, (3),3, 92–107.

Ganjedran, P., & Nagle, Y.K. (2016). Self-Efficiency and Locus of Control in Indian Youth. *The International Journal of Indian Psychology. 3,* (3),3, 137–147.

Contributions in National Conferences

Nagle, Y.K. (2005). *Personality profile of prisoners.* Paper presented at the 92nd session of the Indian Science Congress Association, Nirma University of Science & Technology, Ahmedabad, India.

Nagle, Y.K, & Gupta, A. (2006). *Personality characteristics of alcohol dependence and non-alcohol dependence male.* Paper presented at the 32nd Annual Conference of Indian Psychiatric Society, RINPAS, Ranchi, India.

Nagle, Y.K. & Gupta, A.(2008). *Situational Judgment Test as a predictor of successes in military personnel selection*. Paper presented at 18th Annual Conference of National Academy of Psychology, IIT, Guwahati.

Nagle, Y.K, Rani, Kalpana, E, & Lamba, S. (2011). *Diagnostic Profile of Juvenile Delinquents. A Case report.* Paper presented in the 37th National Annual Conference of Indian Association of clinical psychologist at Gujarat Forensic Sciences University, Gandhinagar.

Nagle YK, Anand K, Gupta, A. (2014). *Army Lifestyles Demands on wellbeing and Family Outlook.* Paper presented in Symposium of Military Psychology, XXIV Annual Convention of NAOP at National Institute of Technical Teachers Training & Research, Bhopal.

Nagle, YK (2015). Personality Profiling for High Risk Job: Challenges for National Security. Paper presented in the Symposium in Annual Conference of Indian Association of clinical psychologist at Pandit Deendayal Petroleum University, Gandhinagar.

Contribution in International Conference

Nagle, Y.K. & Gupta, A.(2007). *Sound Apperception Test story as indices of criminal's personality.* Paper presented at the 3rd International Congress of Psychology and Law, Hilton Adelaide, Australia.

Nagle Y.K, Rani, Kalpana E., & Gupta, A. (2011). *Development of Situational Judgment Test of personality for personnel selection.* Paper presented in International Conference on Advances in Military Psychology: Soldier Preparedness at Institute for Defence Studies and Analysis, New Delhi.

Nagle, Y.K, & Rani, E.K. (2016). Pictorial Situational Judgement Test of Personality Development and Validation. Paper presented in 58th International Conference of International Military Testing Association at New Delhi.

Selected Research Grants

Project Title: Development and Validation of Sound Apperception Test, from Defence Institute of Psychological Research, DRDO, Government of India, Ministry of Defence, Delhi, INR. 0.55 lakh. (1997–1998). *As Principal Investigator.*

Project Title: Vocational personality of youth joining Defence Services as a Career, from Defence Institute of Psychological Research, DRDO, Government of India, Ministry of Defence, Delhi, INR. 4,55,000/– (2000–2003). *As Principal Investigator.*

Project Title: Development and Validation of Situational Judgement Test of Personality, grant from Defence Institute of Psychological Research, Delhi, INR. 8, 50,000/– (2008–2009). *As Principal Investigator.*

Project Title: De Novo Selection System for the Indian Armed Forces, grant from Defence Institute of Psychological Research, Delhi, INR 1123 Lakhs (2009–2014). *As Coinvestigator.*

Project Title: Development and Validation of Screening test for Special Forces, grant from Defence Institute of Psychological Research, Delhi, INR. 2, 50,000/– (2009–2010). *As Principal Investigator.*

Project Title: Development and validation of Pictorial Judgement Test of Affect: Revised, grant from Defence Institute of Psychological Research, Delhi, INR 8.5 Lakh (2015–2016). *As Coinvestigator.*

Project Title: Development and validation of Pictorial Judgement Test of Value, grant from Defence Institute of Psychological Research, Delhi, INR 6.5 Lakh (2015–2016). *As Coinvestigator.*

Editorial Assignments

- Guest Editor of Special Issue Defence Life Science Journal – 2017
- Member of Editorial Board for the Personality and Individual Differences since 2012
- Reviewer for the Personality and Individual Differences (2006–2012)
- Reviewer for the British Journal of Psychology (2009–2010)
- Reviewer for the Journal of Industrial Psychiatry since 2010.
- Reviewer for the Journal of Psychology since 2016.
- Reviewer for the International Journal of Management since 2016.

Supervision of Doctoral Research

Awarded

Purushothaman, T. (2010). Mental health as function of spirituality, social support and physical health across gender among Indians. *PhD*

Thesis in Psychology Bharathiar University, Coimbatore, India.

Verma, R. (2016). *Personality factor as Determinants of Coping Resources Among Indian Air Force Officers. PhD Thesis in Psychology Singhania University, Pacheri Bari, India.*

Submitted

Gajendran, P. (2016). *Self-Efficacy and Locus of Control as Determinants of Emotional Competency Among Indian Job Aspirant. PhD Thesis in Psychology, Bharathiar University, Coimbatore, India.*

Anand, K. (2017). Anand, Kalpna. *Perfectionism as a Determinant of Psychological and Subjective Wellbeing: Mediating Role of Perceived Stress and Perceived Social Support. PhD Thesis in Psychology, Bharathiar University, Coimbatore, India.*

Progress

Dangi, Shivani (2013–2017). *Personality Factors and Belief System as Predictors of Well-being among Adolescent. Bharathiar University, Coimbatore, India.*

Supervision of Master Research

Gosh, R. (2014); *Perfectionism and Perceived Stress Predictors Of Life Satisfaction Among Male And Female Adults. Dissertation Masters of Psychology, Department of Psychology, University of Delhi, India.*

Malik, N. *(2015); Thematic Apperception Test Protocols of Juvenile Delinquents. Dissertation Masters of psychology, Department of Psychology, University of Delhi, India.*

Singh, H. (2015). *Coping Strategies And Self Efficacy As Predictors Of Subjective And Psychological Wellbeing Among Young Adults. Dissertation Masters of Psychology, Department of Psychology, University of Delhi.*

Dhingra, K. (2016). *Personality Factor As A Function of Emotional Adjustment And Social Adjustment Among Children of Air Force And Non Air Force Personnel. Dissertation Masters of Psychology, Department of Psychology, University of Delhi, India.*

Honor and Award

Indian Council of Social Science Research, New Delhi, Doctoral Fellowship, in the year 1988.

Spin-off DRDO, Ministry of Defence, Government of Delhi, India, Award in the year 2007.

For outstanding contribution in the area in the personnel selection of the Indian Armed Forces, the Group Technology Award was conferred by DIPR, DRDO, Ministry of Defence, Government of India, in the year 2012.

Certificate of Excellence in reviewing for the Journal Personality and Individual Differences by Elsevier, Amsterdam, The Netherlands in 2013.

Certificate of Outstanding Contribution in reviewing for the Journal Personality and Individual Differences by Elsevier, Amsterdam, The Netherlands in 2015.

For outstanding contribution in the area in the personality assessment, test development, and psychological operations for the Indian Armed Forces, the Group Technology Award was conferred by DIPR, DRDO, Ministry of Defence, Government of India, in the year 2016

Membership of Professional Societies

- Indian Psychological Association, India (1988–1991)
- Indian Science Congress Association, India (Life Member since 1997)
- Association of Industrial Psychiatry of India (Life Fellow since 2003)
- Canadian Psychological Association, Canada (2005–2006)
- National Academy of Psychology (2006–2008, 2010, 2014)
- American Psychological Association (International Affiliate)

References

Anand, K., & Nagle, Y. K. (2016). Development and validation of perfectionism scale for Indian adults. *International Journal of Psychology and Behavioral Sciences, 6*(5), 206–212.

Dangi, S., & Nagle, Y. K. (2016). Development and validation of religious systems scale. *The International Journal of Indian Psychology, 3*(3.) 3, 92–107.

Nagle, Y. K. (1991). *A study of difference in attitude towards non-violence, creativity, and conformity of the scheduled tribe and high caste students*. Unpublished PhD Thesis in Applied Psychology, Devi Ahilya Vishwavidyalaya, Indore.
Nagle, Y. K. (1996). *Non-violent attitude scale and manual*. Varanasi: Rupa Psychological Centre, India.
Nagle, Y. K., & Anand, K. (2012). Empathy and personality traits as predictors of adjustment in Indian youth. *Industrial Psychiatry Journal, 21*(2), 125–129.
Nagle, Y. K., & Rani, E. K. (2015). Sound apperception test: Development and validation. *Global Journal of Human-Social Science: A Arts & Humanities-Psychology, 15*(8.) 1.0, 49–54.
Nagle, Y. K., & Rani, E. K. (2016). Pictorial judgment test of personality development and validation. Paper presented in 58th international conference of international military testing association at New Delhi.
Nagle, Y. K., Srivastava, K., & Gupta, A. (Eds.). (2014). *Handbook of forensic psychology*. Bloomington: Author House, UK, Ltd.
Purushothaman, T., Pradhan, J., Nagle, Y. K., & Anand, K. (2015). Spirituality scale: Development and validation. *Journal of Advanced Research in Medical Science and Technology, 2*(2), 1–10.
Sharma, N., & Nagle, Y. K. (2015). Development of pictorial situational judgement test of affect. *Psychology, 6*(4), 400–408.

Naïve Psychology

► Attributions

Narcissism

Mitja D. Back[1] and Carolyn C. Morf[2]
[1]Westfälische Wilhelms-Universität, Münster, Münster, Germany
[2]Institute of Psychology, University of Bern, Bern, Switzerland

Definition

Narcissism is a multifaceted personality trait encompassing individual differences in feelings of grandiosity and entitlement and in strivings for attention and superiority. It is distinguished from Narcissistic Personality Disorder which refers to extreme manifestations of the personality trait marked by significant distress and impairments in personality and interpersonal functioning.

Introduction

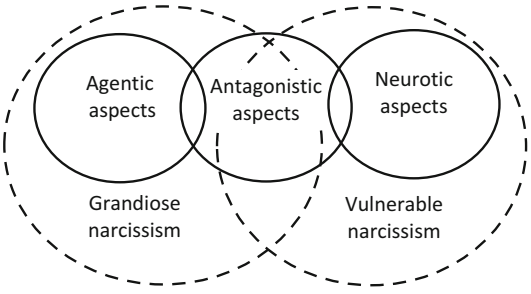
Ovid's Metamorphoses include the story of Narcissus and Echo, where narcissus, a young, handsome man rejected those who desired him (including the nymph Echo) and fell in love with his own reflection in a pool of water, ultimately, dying in despair as he cannot consummate this love. Inspired by Ovid's story, psychologist Havelock Ellis was the first to refer to a narcissus-like mental disorder that is characterized by pathological self-absorption. Sigmund Freud (1914/1990) who subsequently popularized the concept of narcissism saw it as a regular developmental stage in childhood but as a disorder at later stages of development. Building on these concepts, Heinz Kohut (1977) and Otto Kernberg (1975) provided detailed theories about the development of the narcissistic personality as the result of problematic parental experiences in childhood. Thereafter, personality and social psychologists began to study narcissism as a complex personality trait on which individuals in the normal population differ in their degree of grandiosity and entitlement. Since the early 1980s, when narcissism was first added to the Diagnostic and Statistical Manual of Mental Disorders (*DSM-III*; American Psychiatric Association [APA] 1980), providing the basis for subsequent assessment tools, narcissism as a personality trait has received an enormous increase in attention, both by researchers and the general public (Miller et al. 2017). It has become a highly popular concept and one of the most studied personality constructs in psychology. It also is widely applied by laypersons to characterize generations, as well as individual peers, (previous) romantic relationship partners, managers, celebrities, and politicians alike.

Structure, Assessment, and Personality Correlates of Narcissism

Narcissism is typically analyzed as a continuous personality trait ranging from very low scores to

very high scores with most individuals falling into the low to medium ranges. Traditionally, narcissism has most commonly been measured with the Narcissistic Personality Inventory (NPI; Raskin and Terry 1988), a questionnaire with 40 forced-choice items, for each of which respondents have to choose between a more and a less narcissistic statement (e.g., "I am more capable than other people." vs. "There is a lot that I can learn from other people."). The NPI covers aspects of grandiose (or overt) narcissism such as grandiosity, arrogance, and dominance, but it does not assess the more vulnerable (or covert) aspects of narcissism such as shame, hypersensitivity, and thin-skinnedness (Miller et al. 2011; Pincus et al. 2009; Wink 1991). Also it does not provide a distinct assessment of its antagonistic aspects that are typically enmeshed within grandiose as well as vulnerable narcissism (Back et al. 2013; Miller et al. 2016). More recent research suggests an alternative three-dimensional structure of narcissism which encompasses distinctive agentic, antagonistic, and neurotic aspects (see Krizan and Herlache 2018; Miller et al. 2016). Figure 1 illustrates the conceptual and empirical relation between this three-dimensional conceptualization of narcissism and the more classic two-dimensional distinction between grandiose and vulnerable narcissism.

In an effort to provide more multifaceted assessments of narcissism, additional narcissism measures have been developed including the Pathological Narcissism Inventory (PNI; Pincus et al. 2009;), the Narcissistic Admiration and Rivalry Questionnaire (NARQ; Back et al. 2013), and the Five Factor Narcissism Inventory (FFNI; Glover et al. 2012). Table 1 summarizes how subscales of these inventories as well as other specific scales such as the Grandiose Narcissism Scale (Rosenthal et al. 2007), the Entitlement scale (Campbell et al. 2004), and the Hypersensitivity Narcissism Scale (Hendin and Cheek 1997), relate to the agentic, antagonistic, and neurotic aspects of narcissism.



Narcissism, Fig. 1 Relation between different conceptualizations and aspects of narcissism. Conceptually and empirically derived associations between aspects are indicated by overlapping circles

Studies on personality correlates of narcissism reveal many variations in the behaviors that characterize different expressions of narcissism, depending on the features that predominate (e.g., Miller et al. 2016; Morf et al. 2017). Narcissists with primarily grandiose features are best characterized by extraversion, and high self-esteem, but also with entitlement, arrogance, and disagreeableness. Narcissists whose vulnerable aspects prevail also are low in agreeableness and show high entitlement and arrogance. Unlike their grandiose counterparts, however, they simultaneously have low self-esteem, and high anxiety and neuroticism. Grandiose and vulnerable narcissism, thus, share their antagonism and entitlement, but differ with respect to their overlap with agentic features, such as extraversion, self-esteem, and dominance (grandiose), as well as neuroticism (vulnerable), respectively. One broad distinction underlying the two manifestations of narcissism is their differential orientation to approach versus avoidance. Narcissists with grandiose features are sensitive for positive outcomes and rewards and engage in agentic approach-related behaviors (e.g., Campbell and Foster 2007). Narcissists with vulnerable attributes in contrast orient toward potential negative outcomes or threats, which elicits avoidance or withdrawal behavior (e.g., Pincus et al. 2009).

A pressing issue for future research will be to continue to explore how these different aspects of narcissism combine and interact to produce the characteristic set of narcissistic features within different individuals.

Narcissism, Table 1 Exemplary measures of agentic, antagonistic, and neurotic aspects of narcissism

Inventories	No items	Agentic aspects	Antagonistic aspects	Neurotic aspects
Narcissistic Personality Inventory (NPI)	40	Leadership/authority	Exploitativeness/ entitlement	–
Narcissistic Admiration and Rivalry Questionnaire (NARQ)	18	Admiration (grandiosity, striving for uniqueness, charmingness)	Rivalry (devaluation, striving for supremacy, aggressiveness)	–
Pathological Narcissism Inventory (PNI)	52	Grandiose fantasies	Entitlement rage	Contingent self-esteem; hiding the self; devaluation
Five Factor Narcissism Inventory (FFNI)	148	Acclaim seeking; authoritativeness; grandiose fantasies; exhibitionism	Exploitativeness, lack of empathy, entitlement, arrogance	Shame; *indifference*; need for admiration
Specific Narcissism scales	35	Grandiosity scale	Entitlement scale	Hypersensitivity narcissism scale

Note. For each Inventory, only exemplary facets are selected – those that can be most clearly assigned to one of the three aspects of narcissism

Determinants and Development of Narcissism

Early conceptual approaches to understanding who becomes a narcissist focused on either parental devaluation (Kernberg 1975; Kohut 1977) or parental overvaluation (Millon 1981). Empirical insights on the developmental origins of narcissism is mainly based on cross-sectional associations between narcissism self-reports and retrospective reports about the parents' parenting style. While this research revealed some evidence for both factors when analyzing childhood recollections (Thomaes et al. 2013), such post hoc reports are often of uncertain validity. In one recent exception, Brummelmann and colleagues (2015) investigated over 500 children (ages 7–11) and their parents longitudinally across four 6-month waves and found effects of parental overevaluation but not of lack of parental warmth on later grandiose narcissism. In another large longitudinal study of Mexican-origin children and their parents (Wetzel and Robins 2016), parental hostility was associated with more and parental monitoring (i.e., being informed about how and with whom their child spends their time) with less exploitativeness from age 12 to 14. These effects replicated across child reports, spouse reports, and behavioral coding of parenting. Altogether, this preliminary evidence suggests that parental overvaluation may primarily predict grandiose and particularly agentic aspects of narcissism, whereas parental hostility and lack of monitoring predict antagonistic aspects, and parental devaluation might be more relevant in predicting neurotic aspects of narcissism.

Moreover, narcissism has a substantial genetic component that seems to be at least as strong as for other broad personality traits (Livesley et al. 1998). In a recent study, Luo and colleagues (Luo et al. 2014) replicated these findings and also differentiated between more agentic (grandiosity) and more antagonistic (entitlement) aspects of grandiose narcissism. They found modest heritability coefficients for both aspects. There was only a very small overlap of the genetic and environmental sources of variation in agentic and antagonistic narcissism – speaking for the distinctiveness of these aspects of grandiose narcissism.

Differences in narcissism levels between individuals tend to be stable from young adulthood onwards at least similar in magnitude as other broad personality traits (Brummelmann et al. 2015; Wetzel and Robins 2016). In one of the few longitudinal studies, Orth and Luciano (2015) found no effects of stressful life-events on subsequent changes in narcissism – at least across brief time intervals of 6 and 18 months, respectively. Narcissism within individuals shows a decline over the life course – on the whole, it is greater in young adulthood compared to middle and old adulthood (Cramer 2011). In addition, it

has been proposed that the current younger generations are more narcissistic than previous generations (Twenge and Foster 2010), but this evidence is equivocal (Wetzel et al. 2017). Men usually score somewhat higher than women in grandiose but not in vulnerable narcissism (Grijalva et al. 2015b). There also seem to be cultural differences: Narcissism tends to be more pronounced in cultures that value individualism and self-promotion (Miller et al. 2015).

Further empirical research on the development of narcissism is certainly needed, especially large, representative longitudinal studies. Optimally, these should include rich repeated information on participant's social contexts and social interactions with various kinds of interaction partners, in order to help unravel narcissistic development at all life stages.

Narcissistic Dynamics

At the core, narcissists are intent on confirming their grandiose self and superiority over others (e.g., Morf et al. 2011). This means that they endeavor to take advantage of opportunities to show off and enhance the self and at the same time, they also attempt to deflect threats to their grandiose selves. This core goal and basic dynamic gets played out in a variety of unique and entangled ways of wanting, thinking, feeling, and behaving, particularly in social contexts. While beyond the scope of this review, these dynamics and how they can be related to the structure and different dimensions of narcissism have been described in several detailed conceptual models including the Dynamic Self-Regulatory Processing Model (Morf and Rhodewalt 2001; Morf et al. 2011), the Extended Agency Model (Campbell and Foster 2007), the Contextual Reinforcement Model (Campbell and Campbell 2009), the Narcissistic Admiration and Rivalry Concept (Back et al. 2013), and the Narcissism Spectrum Model (Krizan and Herlache 2018). The essential intra- and interpersonal dynamics are seen in how narcissists (1) select, construe, and what they expect of situations, (2) how they behave and what they experience during those situations, and (3) how they evaluate and react to the outcomes and consequences they experience.

First, in their choice of situations, narcissists typically prefer and are more strongly motivated in situations in which they perceive an opportunity for glory and status (Morf et al. 2000; Wallace and Baumeister 2002). They strive for achievements and power (i.e., to "get ahead") rather than for close and intimate social relations (i.e., to "get along"; Morf and Rhodewalt 2001; Campbell and Foster 2007). Narcissists also expect better performances, even after failure (Lakey et al. 2008), perhaps because they automatically inhibit threatening information (Horvath and Morf 2009) These choices are particularly characteristic for agentic aspects of narcissism, which are characterized by strong approach motivation and assertive striving for self-enhancement (self-promotion), while more antagonistic aspects of narcissism are characterized by avoidance motivation and antagonistic striving for self-protection (self-defense; Back et al. 2013).

Second, within social situations, narcissists show a typical distinctive set of self-presentations in their appearances and reactions. They typically are better looking and dress in more stylish ways (Back et al. 2010; Holtzman and Strube 2010; Vazire et al. 2008). Further, they tend to be in a more energetic and optimistic mood, perceive others as a source of admiration, and behave in self-assured ways that escalate if others seem to agree with and applaud them (Back et al. 2010). Particularly when being criticized, narcissists also experience anger, perceive others as the source of frustration, and can become aggressive and combative (Krizan and Johar 2015). The former reactions of exploiting self-presentational opportunities are particularly characteristic of agentic aspects of narcissism, whereas the reactions of striking back when criticized are particularly characteristic of antagonistic aspects of narcissism (Leckelt et al. 2015).

Third, narcissists also differ distinctively in how they evaluate social and performance outcomes, as well as how they perceive themselves and their social interaction partners. They tend to overattribute successes to themselves and their

own innate ability, even in cases when successes were independent of actual performance (e.g., Rhodewalt and Morf 1998;). In so doing, narcissists capitalize and make the most out of success. In the face of failure, they tend to blame or devalue others (Kernis and Sun 1994). Moreover, they do so even to the other person's face (Morf and Rhodewalt 1993). Presumably, the former reactions to successes are driven by more agentic aspects, while the latter reactions to failures are driven by antagonistic aspects of narcissism. Narcissism is also related to unique affective reactions following social interaction, for example, self-conscious emotions such as shame and pride (Tracy et al. 2011) – shame being a typical emotion of those high in vulnerable narcissism and narcissism in general being more related to hubristic than authentic pride. Narcissism is also related to stronger reactions of envy, with agentic narcissism predicting envy that is more benign, and antagonistic narcissism predicting more malicious envy (Lange et al. 2016).

In sum, narcissism in its diverse expressions is related to many fascinating and often seemingly contradictory or paradoxical intra- and interpersonal process dynamics. The over-riding goal to construct and support a grandiose self and to avoid threats to this superiority helps explain behaviors that otherwise may look on the surface paradoxical. A long-standing but still puzzling question pertains to the underlying motivational core of this goal driving the observed dynamics. Narcissism has been often conceptualized as linked to a puffed-up but precarious self, reflected in having both highly grandiose self-views but simultaneously also high variability and instability in the self-esteem experienced (e.g., Morf and Rhodewalt 2001). Recent research showing unique patterns of self-esteem dynamics between different aspects of narcissism helps shed some light on this issue: As noted, agentic aspects of narcissism relate positively to self-esteem, while perceived negative social feedback tends to increase drops in self-esteem particularly for those high in antagonistic or neurotic aspects of narcissism (Zeigler-Hill and Besser 2013; Geukes et al. 2017). Thus, agentic aspects of narcissism may puff up self-esteem, but antagonistic and neurotic aspects of narcissism may make it precarious.

Narcissism and Consequential Outcomes

The mental mechanisms and psychological dynamics that underlie narcissism lead to a host of diverse outcomes that characterize the everyday lives of those high in narcissism (as well as their interaction partners). At an intrapersonal level, agentic aspects of narcissism relate positively to measures of optimism, positive affect, life satisfaction, and self-reported health (e.g., Sedikides et al. 2004). Hence, individuals high in agentic grandiose narcissism typically self-report to be well adjusted, which seems to reflect their higher self-esteem. Antagonistic, and particularly neurotic aspects of narcissism, however, are related to poor mental health and even to psychopathology (Back et al. 2013; Miller et al. 2011, 2017; Morf et al. 2017).

How narcissists fare interpersonally depends not only on the aspect of narcissism considered, but also the relationship type, its duration, and the situational context (Campbell and Campbell 2009; Leckelt et al. 2015). Grandiose Narcissists are often more popular among peers at first sight (Back et al. 2010; see Küfner et al. 2013, for an overview), but this popularity vanishes over time. In a groundbreaking study on student work groups, Paulhus (1998) showed that narcissists were positively evaluated (e.g., as more competent, entertaining, and well adjusted) by their peers at short-term acquaintance but negatively evaluated (e.g., as more hostile and arrogant) 6 weeks later. This change over time occurs because grandiose narcissism relates to both the tendency to behave dominantly and assertively, which is seen positively, as well as the tendency to behave arrogantly and combatively which is seen as aggressive (Back et al. 2013; Küfner et al. 2013). Moreover, the former pathway is more relevant in early, more superficial, stages of interaction. On first meeting, narcissists are motivated and able to present themselves positively (e.g., narcissists break the ice), and usually there are few triggers for aggressive or unempathic

behavior. This changes, however, as relationships develop over time and become more intimate and there is more potential for conflict. Narcissists are notoriously bad at considering the other person's point of view and become confrontational if they feel criticized. Hence, while the agentic aspects of narcissism lead to popularity in early stages of the acquaintance process, its antagonistic aspects leads to unpopularity in later relationship stages (Leckelt et al. 2015). In romantic relationships, narcissism similarly is related to romantic success in short-term contexts such as physical and sexual attraction, mate appeal, and dating success but also to problems in long-term committed relationships, seen in lower emotional intimacy, love, and trust and higher conflict frequency and intensity (see Campbell et al. 2006, and Wurst et al. 2017 for overviews).

Narcissism also has profound consequences in organizational contexts (see Braun 2017, for a review). Grandiose narcissism has been shown to be positively related to *leadership emergence* (i.e., narcissists are more likely to be chosen as leaders), but findings are mixed regarding *leadership effectiveness*. Narcissism is related to "bright side" leadership such as socially skilled and charming behaviors, the articulation of change-oriented goals, and the facilitation of work group creativity, as well as "dark side" leadership such as risky, exploitative, and unethical behaviors. A medium degree of narcissism may be more effective than either low or high narcissism (Grijalva et al. 2015a). Much less is known about the relation between narcissism and actual job performance. Narcissists' tendencies for overly confident states of mind, a lower communal orientation, risky decisions, and counterproductive work behaviors should, however, be related to a number of long-term performance problems, particularly regarding interpersonal aspects of performance. In contexts in which continuous self-presentation alone is valuable, narcissists might thrive more sustainably, for example, as actors (Dufner et al. 2015). On a meta-organizational level, narcissistic leaders might succeed in having their organization dominate and win over other organizations but they might do so by destroying systems their own organization depends on as well (Braun 2017).

In sum, narcissism is related to a wide range of consequential outcomes regarding intrapsychic, interpersonal, and occupational domains. In general, individuals whose agentic features are in the foreground might be seen as "successful narcissists." Individuals who score high on several narcissistic features, in contrast, may be characterized by more complex and dynamics, and be seen as "struggling narcissists" or even "failed narcissists." Future research should focus on gaining a better understanding of the moderating factors and mediating processes that intensify or buffer these outcomes. For example, narcissists with mostly agentic features might be particularly popular and all the more successful, if they score high on emotional capacities, verbal fluency, and social skills, allowing them to implement their self-presentational goals in convincing ways. Similarly, narcissists whose antagonistic features predominate might suffer less from their thin-skinned reactions to negative feedback if they have the executive capacities to inhibit their aggressive urges and to accurately monitor and tailor their own behavior.

Conclusion

Narcissism, with its remarkably diverse expressions, its multiple causes and consequences, and its potential management is a construct that does not only fascinate the general public but also remains one of the most active areas for psychological research. Like most important areas of research, with each question it begins to answer, it raises new questions that need to be pursued. The results provide an increasingly detailed understanding of the complex structure of narcissism as well as of the environmental and genetic sources of narcissism. Accumulating empirical evidence also keeps refining the description of the variety of systematically related narcissistic processes that shape the intrapsychic and social reality, as well as their life-long consequences – both good and bad, for narcissists themselves and for their relationship partners.

Cross-References

- ▶ Entitlement
- ▶ Five-Factor Narcissism Inventory
- ▶ Narcissistic Personality Disorder
- ▶ Rank, Otto

References

American Psychiatric Association [APA]. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.

Back, M. D., Schmukle, S. C., & Egloff, B. (2010). Why are narcissists so charming at first sight? Decoding the narcissism-popularity link at zero acquaintance. *Journal of Personality and Social Psychology, 98*, 132–145.

Back, M. D., Küfner, A. C. P., Dufner, M., Gerlach, T. M., Rauthmann, J. F., & Denissen, J. J. A. (2013). Narcissistic admiration and rivalry: Disentangling the bright and dark sides of narcissism. *Journal of Personality and Social Psychology, 105*, 1013–1037.

Braun, S. (2017). Leader narcissism and outcomes in organizations: A review at multiple levels of analysis and implications for future research. *Frontiers in Psychology, 8*, 773.

Brummelman, E., Thomaes, S., Nelemans, S. A., Orobio de Castro, B., Overbeek, G., & Bushman, B. J. (2015). Origins of narcissism in children. *Proceedings of the National Academy of Sciences of the United States of America, 112*, 3659–3662. https://doi.org/10.1073/pnas.1420870112.

Campbell, W. K., & Campbell, S. M. (2009). On the self-regulatory dynamics created by the peculiar benefits and costs of narcissism: A contextual reinforcement model and examination of leadership. *Self and Identity, 8*, 214–232. https://doi.org/10.1080/15298860802505129.

Campbell, W. K., & Foster, J. D. (2007). The narcissistic self: Background, an extended agency model, and ongoing controversies. In C. Sedikides & S. Spencer (Eds.), *Frontiers in social psychology: The self* (pp. 115–138). Philadelphia: Psychology Press.

Campbell, W. K., Bonacci, A. M., Shelton, J., Exline, J. J., & Bushman, B. J. (2004). Psychological entitlement: Interpersonal consequences and validation of a self-report measure. *Journal of Personality Assessment, 83*, 29–45. https://doi.org/10.1207/s15327752jpa8301_04.

Campbell, W. K., Brunell, A. B., & Finkel, E. J. (2006). Narcissism, interpersonal self-regulation, and romantic relationships: An agency model approach. In K. D. Vohs & E. J. Finkel (Eds.), *Self and relationships: Connecting intrapersonal and interpersonal processes* (pp. 57–83). New York: Guilford Press.

Cramer, P. (2011). Narcissism through the ages: What happens when narcissists grow older? *Journal of Research in Personality, 45*(5), 479–492.

Dufner, M., Egloff, B., Hausmann, C., Wendland, L.-M., Neyer, F. J., & Back, M. D. (2015). Narcissistic tendencies among actors: Craving for admiration, but not at the cost of others. *Social Psychological and Personality Science, 6*, 447–454.

Freud, S. (1990). Zur Einführung des Narzissmus [On narcissism: An introduction]. In *Gesammelte Werke* (8 ed.). Frankfurt: S. Fischer. (Original published 1914).

Geukes, K., Nestler, S., Hutteman, R., Dufner, M., Küfner, A. C. P., Egloff, B., Denissen, J. J. A., & Back, M. D. (2017). Puffed up but shaky selves: State self-esteem level and variability in narcissists. *Journal of Personality and Social Psychology, 112*, 769–786.

Glover, N., Miller, J. D., Lynam, D. R., Crego, C., & Widiger, T. A. (2012). The five-factor narcissism inventory: A five-factor measure of narcissistic personality traits. *Journal of Personality Assessment, 94*, 500–512. https://doi.org/10.1080/00223891.2012.670680.

Grijalva, E., Harms, P. D., Newman, D. A., Gaddis, B. H., & Fraley, R. C. (2015a). Narcissism and leadership: A meta-analytic review of linear and nonlinear relationships. *Personnel Psychology, 68*(1), 1–47. https://doi.org/10.1111/peps.12072.

Grijalva, E., Newman, D. A., Tay, L., Donnellan, M. B., Harms, P. D., Robins, R. W., & Yan, T. (2015b). Gender differences in narcissism: A meta-analytic review. *Psychological Bulletin, 141*, 261–310.

Hendin, H. M., & Cheek, J. M. (1997). Assessing hypersensitive narcissism: A reexamination of Murray's narcism scale. *Journal of Research in Personality, 31*(4), 588–599.

Holtzman, N. S., & Strube, M. J. (2010). Narcissism and attractiveness. *Journal of Research in Personality, 44*, 133–136.

Horvath, S., & Morf, C. C. (2009). Narcissistic defensiveness: Hypervigilance and avoidance of worthlessness. *Journal of Experimental Social Psychology, 45*, 1252–1258.

Kernberg, O. (1975). *Borderline conditions and pathological narcissism*. New York: Aronson.

Kernis, M. H., & Sun, C.-R. (1994). Narcissism and reactions to interpersonal feedback. *Journal of Research in Personality, 28*, 4–13.

Kohut, H. (1977). *The restoration of the self*. New York: International Universities Press.

Krizan, Z., & Herlache, A. D. (2018). The narcissism spectrum model: A synthetic view of narcissistic personality. *Personality and Social Psychology Review, 22*, 3–31.

Krizan, Z., & Johar, O. (2015). Narcissistic rage revisited. *Journal of Personality and Social Psychology, 108*, 784–801.

Küfner, A. C. P., Nestler, S., & Back, M. D. (2013). The two pathways to being an (un-) popular narcissist. *Journal of Personality, 81*, 184–195.

Lakey, C. E., Rose, P., Campbell, W. K., & Goodie, A. S. (2008). Probing the link between narcissism and gambling: The mediating role of judgment and decision-making biases. *Journal of Behavioral Decision Making, 21*, 113–137.

Lange, J., Crusius, J., & Hagemeyer, B. (2016). The evil queen's dilemma: Linking narcissistic admiration and rivalry to benign and malicious envy. *European Journal of Personality, 30*, 168–188. https://doi.org/10.1002/per.2047.

Leckelt, M., Küfner, A. C. P., Nestler, S., & Back, M. D. (2015). Behavioral processes underlying the decline of narcissists' popularity over time. *Journal of Personality and Social Psychology, 109*, 856–871.

Livesley, W. J., Jang, K. L., & Vernon, P. A. (1998). Phenotypic and genetic structure of traits delineating personality disorder. *Archives of General Psychiatry, 55*, 941–948.

Luo, Y. L. L., Cai, H., & Song, H. (2014). A behavioral genetic study of intrapersonal and interpersonal dimensions of narcissism. *PLoS One, 9*(4), e93403.

Miller, J. D., Hoffman, B. J., Gaughan, E. T., Gentile, B., Maples, J., & Campbell, W. K. (2011). Grandiose and vulnerable narcissism: A nomological network analysis. *Journal of Personality, 79*, 1013–1042.

Miller, J. D., Maples, J. L., Buffardi, L., Cai, H., Gentile, B., Kisbu-Sakarya, Y., … & Siedor, L. (2015). Narcissism and United States' culture: The view from home and around the world. *Journal of Personality and Social Psychology*, *109*(6), 1068–1089.

Miller, J. D., Lynam, D. R., McCain, J. L., Few, L. R., Crego, C., et al. (2016). Thinking structurally about narcissism: An examination of the five-factor narcissism inventory and its components. *Journal of Personality Disorders, 30*, 1–18.

Miller, J. D., Lynam, D. R., Hyatt, C. S., & Campbell, W. K. (2017). Controversies in narcissism. *Annual Review in Clinical Psychology, 13*, 291–315.

Millon, T. (1981). *Disorders of personality*. New York: Wiley.

Morf, C. C., & Rhodewalt, F. (1993). Narcissism and self-evaluation maintenance: Explorations in object relations. *Personality and Social Psychology Bulletin, 19*, 668–676.

Morf, C. C., & Rhodewalt, F. (2001). Unraveling the paradoxes of narcissism: A dynamic self-regulatory processing model. *Psychological Inquiry, 12*, 177–196. https://doi.org/10.1207/S15327965PLI1204_1.

Morf, C. C., Weir, C. R., & Davidov, M. (2000). Narcissism and intrinsic motivation: The role of goal congruence. *Journal of Experimental Social Psychology, 36*, 424–438.

Morf, C. C., Torchetti, L., & Schürch, E. (2011). Narcissism from the perspective of the dynamic self-regulatory processing model. In W. K. Campbell & J. D. Miller (Eds.), *The handbook of narcissism and narcissistic personality disorder: Theoretical approaches, empirical findings, and treatments* (pp. 56–70). Hoboken: Wiley. https://doi.org/10.1002/9781118093108.ch6.

Morf, C. C., Schürch, E., Küfner, A., Siegrist, P., Vater, A., Back, M., Mestel, R., & Schröder-Abé, M. (2017). Expanding the nomological net of the pathological narcissism inventory: German validation and extension in a clinical inpatient sample. *Assessment, 24*, 419–443.

Orth, U., & Luciano, E. C. (2015). Self-esteem, narcissism, and stressful life events: Testing for selection and socialization. *Journal of Personality and Social Psychology, 109*, 707–721.

Paulhus, D. L. (1998). Interpersonal and intrapsychic adaptiveness of trait self-enhancement: A mixed blessing. *Journal of Personality and Social Psychology, 74*, 1197–1208. https://doi.org/10.1037/0022-3514.74.5.1197.

Pincus, A. L., Ansell, E. B., Pimentel, C. A., Cain, N. M., Wright, A. G., & Levy, K. N. (2009). Initial construction and validation of the pathological narcissism inventory. *Psychological Assessment, 21*, 365–379. https://doi.org/10.1037/a0016530.

Raskin, R., & Terry, H. (1988). A principal-components analysis of the narcissistic personality inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology, 54*, 890–902.

Rhodewalt, F., & Morf, C. C. (1998). On self-aggrandizement and anger: A temporal analysis of narcissism and affective reactions to success and failure. *Journal of Personality and Social Psychology, 74*, 672–685.

Rosenthal, S. A., Hooley, J. M., & Steshenko, Y. (2007). *Distinguishing grandiosity from self-esteem: Development of the narcissistic grandiosity scale*. Manuscript in preparation.

Sedikides, C., Rudich, E. A., Gregg, A. P., Kumashiro, M., & Rusbult, C. (2004). Are normal narcissists psychologically healthy? Self-esteem matters. *Journal of Personality and Social Psychology, 87*, 400–416. https://doi.org/10.1037/0022-3514.87.3.400.

Thomaes, S., Brummelman, E., Reijntjes, A., & Bushman, B. J. (2013). When narcissus was a boy: Origins, nature, and consequences of childhood narcissism. *Child Development Perspectives, 7*, 22–26. https://doi.org/10.1111/cdep.12009.

Tracy, J. L., Cheng, J. T., Martens, J. P., & Robins, R. W. (2011). The emotional dynamics of narcissism: Inflated by pride, deflated by shame. In W. K. Campbell & J. D. Miller (Eds.), *The handbook of narcissism and narcissistic disorder: Theoretical approaches, empirical findings, and treatments* (pp. 330–343). Hoboken: Wiley. https://doi.org/10.1002/9781118093108.ch29.

Twenge, J. M., & Foster, J. D. (2010). Birth cohort increases in narcissistic personality traits among American college students, 1982–2009. *Social Psychological and Personality Science, 1*, 99–106.

Vazire, S., Naumann, L. P., Rentfrow, P. J., & Gosling, S. D. (2008). Portrait of a narcissist: Manifestations of narcissism in physical appearance. *Journal of Research in Personality, 42*, 1439–1447.

Wallace, H. M., & Baumeister, R. F. (2002). The performance of narcissists rises and falls with perceived opportunity for glory. *Journal of Personality and Social Psychology, 82*, 819–834. https://doi.org/10.1037/0022-3514.82.5.819.

Wetzel, E., & Robins, R. W. (2016). Are parenting practices associated with the development of narcissism?: Findings from a longitudinal study of Mexican-origin youth. *Journal of Research in Personality, 63*, 84–94.

Wetzel, E., Brown, A., Hill, P., Chung, J. M., Robins, R. W., & Roberts, B. W. (2017). The narcissism epidemic is dead; long live the narcissism epidemic. *Psychological Science, 28*, 1833–1847.
Wink, P. (1991). Two faces of narcissism. *Journal of Personality and Social Psychology, 61*, 590–597.
Wurst, S. N., Gerlach, T. M., Dufner, M., Rauthmann, J. F., Grosz, M. P., Küfner, A. C. P., Denissen, J. J. A., & Back, M. D. (2017). Narcissism and romantic relationships: The differential impact of narcissistic admiration and rivalry. *Journal of Personality and Social Psychology, 112*, 280–306.
Zeigler-Hill, V., & Besser, A. (2013). A glimpse behind the mask: Facets of narcissism and feelings of self-worth. *Journal of Personality Assessment, 95*, 249–260.

Narcissism and Leadership

Anna Z. Czarna[1] and Barbara Nevicka[2]
[1]Faculty of Management and Social Communication, Institute of Applied Psychology, Jagiellonian University, Krakow, Poland
[2]Department of Psychology, Faculty of Social and Behavioural Sciences, University of Amsterdam, Amsterdam, The Netherlands

Synonyms

Dark triad and leadership; Destructive leadership; Narcissism and power; Narcissistic leaders

Definition

Close your eyes and imagine an ideal leader. What would that image look like? What kind of characteristics come to mind? Dominance, confidence, high self-esteem, and extraversion are characteristics that are most commonly associated with people's image of a leader. Interestingly, narcissistic individuals fit this leader image fairly well, which might explain why they tend to emerge as leaders in groups. However, merely rising to a leadership position is not enough – it matters whether narcissists are effective as leaders. Importantly, in addition to their leader-like characteristics, narcissists possess a host of negative characteristics, such as lack of empathy, exploitativeness, arrogance, inability to deal with criticism, and aggressive tendencies. It is because of these characteristics that the behavior of narcissistic leaders can have negative ramifications for their subordinates, their organizations, or even society at large. In this chapter, we argue that in order to determine whether and when narcissistic leaders are a positive or negative force for those they lead it is imperative to consider contextual factors such as time in leadership position, contextual uncertainty, type of industry, leader's visibility and ethical climate in the organization, and characteristics of the followers.

Introduction

Narcissism as a personality trait constitutes a self-centered, self-aggrandizing, dominant, and manipulative interpersonal orientation (Sedikides et al. 2004). It is characterized by a grandiose, yet fragile, sense of self, a preoccupation with success, a demand for admiration, and engagement in self-enhancement and by difficulties in maintaining interpersonal relationships due to a lack of empathy, trust, and care for others (Morf and Rhodewalt 2001). Narcissistic individuals perceive themselves to be special and unique. They tend to overestimate their abilities in the agentic domain, for example, by believing that they are more intelligent, more creative, and more attractive and have better leadership potential than others. In their quest for power, attention, and a desire to show-off their abilities, narcissistic individuals have a natural propensity to seek out leadership positions (Morf and Rhodewalt 2001). In fact, they dislike being followers unless they are confident that they can rise through the ranks (Zitek and Jordan 2016). Research shows that they succeed in emerging as leaders in groups (Grijalva et al. 2015), particularly in times of uncertainty (Nevicka et al. 2013). The question is what prompts people to choose narcissists as leaders and what kind of leaders are they once they have attained a leadership position.

We should note that this chapter will focus on the grandiose rather than vulnerable dimension of narcissism. Grandiose narcissism is identified by

externalizing features such as confidence, dominance, and extraversion. In contrast, vulnerable narcissism is identified by internalizing features such as introversion, low self-esteem, and high emotional distress (Miller et al. 2017). Given the commonality between characteristics related to grandiose narcissism and those associated with prototypical leaders, grandiose narcissism is more relevant for leadership. For example, prior research found that past US presidents had above average grandiose but not vulnerable narcissism in comparison to the general population (Watts et al. 2013). Additionally, grandiose but not vulnerable narcissism was related to leadership effectiveness indicators.

Narcissism and Leadership Emergence

Theory on the leadership outcomes of narcissism (e.g., Campbell et al. 2011; Padilla et al. 2007; Sedikides and Campbell 2017) has clearly differentiated between narcissistic leadership *emergence* and narcissistic leadership *effectiveness*. One reason why narcissistic individuals might often be chosen as leaders is because they appear to personify people's implicit ideas of what constitutes a leader. The implicit leadership theory (Lord and Maher 1991) posits that the greater the overlap between someone's characteristics and people's implicit leadership schemas (i.e., leader prototypes), the more likely that person will be perceived as a leader. In other words, because narcissistic characteristics such as dominance, confidence, extraversion, and high self-esteem match well onto prototypical leadership schemas, narcissists are perceived as having leader-like qualities and thus emerge as leaders (Sedikides and Campbell 2017).

Another reason that could explain why people prefer narcissists in leadership positions is that narcissists tend to make positive first impressions (Ong et al. 2016), which may be especially helpful in short-term evaluative contexts such as interviews. Narcissists' positive initial impressions may be driven by others' perceptions that they have high self-esteem (Giacomin and Jordan 2018). This can happen because of the self-broadcasting function of self-esteem: others tend to accept the self-evaluations expressed in people's social behavior as valid and reliable sources of information. Thus, increases in self-esteem lead to increases in a person's popularity as judged by others (Zeigler-Hill et al. 2013). These positive initial impressions could enable narcissists to obtain overly favorable hireability ratings despite lacking adequate qualifications and despite their many negative characteristics. Indeed, prior research found that at the time of being hired as managers, narcissistic individuals had less organizational experience, an important criterion for that job (Nevicka et al. 2018b). Therefore, what seems to spur narcissists' rise to leadership positions is their own determination to attain such positions of power, the overlap between their own and prototypical leader characteristics, and the positive impressions that they tend to engender in the short term.

Whereas the rise of narcissists as leaders has been well documented and understood, research on the impact of narcissists in leadership positions on those they lead has shown mixed findings. In the next section, we focus on what kind of leaders narcissists are, once they attain positions of power.

Narcissism and Leadership Effectiveness

Narcissistic individuals have both potentially positive (e.g., charisma, bold vision, motivation to perform, risk-taking) and potentially negative characteristics (e.g., lack of empathy, exploitativeness, egocentrism, hostility, unethical tendencies, risk-taking), and this mixed palette of characteristics might differentially determine whether they are effective or ineffective as leaders. Researchers argue that narcissism can, in some cases, benefit not only the narcissistic person themselves but the organization as a whole (Chatterjee and Hambrick 2007; Sedikides and Campbell 2017). For instance, if narcissists are satisfied with their job and feel secure in their position of authority, they are capable of excelling in job performance (Campbell et al. 2011), especially when they perceive the context as an

opportunity to show off their superior skills (Wallace and Baumeister 2002). Such contexts need to encompass pressure, challenge, and an evaluative audience in order to motivate narcissistic individuals to perform, and these are exactly the ingredients that can be found in leadership positions. Additionally, there is some evidence that following an ego threat (e.g., being told that one is average rather than unique) narcissism can actually fuel performance because narcissists want to demonstrate their superior qualities as a means of countering the ego threat (Nevicka et al. 2016). Therefore, narcissists need to showcase their uniqueness, and their superior abilities might actually motivate them to perform well. In turn this achievement focus could help galvanize their employees in their performance.

Another potential advantage to having narcissistic leaders lies in narcissists' social network centrality and penchant for social media use. Narcissistic leaders seem to amass social capital (Liu et al. 2016) and may, thus, be well suited for the creation and expansion of social network opportunities that are likely to benefit the organization (e.g., linking organizational interests to those of other organizations, introducing key staff to peers from other organizations). Their networking ability may help revitalize the organization and set the stage for showcasing transformational leadership. Narcissists have been found to project bold visions and are perceived as charismatic (Nevicka et al. 2018b), which could inspire subordinates and motivate them to work toward common goals. Narcissists' charisma and enthusiasm may even help advocate successful organizational change by allowing them to act as change agents and idea champions (Campbell et al. 2011). There is some empirical support for these proposals.

For instance, CEO narcissism was positively related to strategic dynamism and to the number or size of acquisitions (Chatterjee and Hambrick 2007), which is indicative of narcissists' bold and risky decision-making and early successes (Sedikides and Campbell 2017). While risk-taking could be advantageous in terms of preventing organizational stagnation and promoting innovation, it can also lead to more volatility. Indeed, Chatterjee and Hambrick (2007) found that CEO narcissism was also positively related to unpredictable and irregular company performance (i.e., big wins, big losses) as measured by financial outcomes, such as return on investment and shareholder returns. Due to the extreme fluctuations in performance, overall, companies under narcissistic CEOs did not do better than companies under less narcissistic CEOs. In terms of innovation, companies led by narcissistic CEOs exhibited a higher rate of new product introductions and a greater proportion of radical innovations in their new product portfolios, but they were also more likely to encounter product harm crises, such as product recall (Kashmiri et al. 2017). The impact of CEO narcissism on these innovation outcomes was partially explained by firms' higher competitive aggressiveness.

In terms of the potential negative impact of narcissistic leaders, narcissists' particular weak point is their difficulty in maintaining positive interpersonal relationships over time. For example, supervisors of narcissistic employees rated them negatively on the interpersonal components of leadership but not on task-specific aspects of leadership (Blair et al. 2008). Given that the most toxic characteristics of narcissistic individuals pertain to the interpersonal domain, the manifestation of these characteristics will probably disproportionately affect those they lead. Narcissistic leaders can cause employee distress because they lack empathy (e.g., Böckler et al. 2017), expect others to strive for perfection and be perfect, and are highly critical of others (but not of themselves; Stoeber et al. 2015). Further, narcissists derogate others and may react with rage when insulted or threatened (Bushman and Baumeister 1998), while also lashing out at innocent others (i.e., displaced aggression) when rejected (Twenge and Campbell 2003, Study 4). Consistent with this, narcissists show a preference for using an autocratic leadership style particularly in ego-threatening circumstances (Schoel et al. 2015) by means of which they attempt to solidify their power and control over others. Remarkably, narcissists disparage others even in the absence of self-threat (Park and Colvin 2015). Such mistreatment may lead to employee feelings of humiliation or hopelessness (Herschcovis and Barling

2010), stress or job dissatisfaction, job burnout (Fox and Stallworth 2010), and turnover intentions (Tepper et al. 2009; Sedikides and Campbell 2017). Indeed, narcissists have been found to constitute poor mentors, with protégés opting for shorter-term relationships with them and reporting less psychosocial or career support as well as more negative mentoring experiences (Allen et al. 2009).

In addition to affecting the well-being of followers, narcissists' pattern of resisting and devaluing others' input and advice and shutting down employee voice can have direct negative consequences on organizational performance (Kausel et al. 2015; Maccoby 2000; Rosenthal and Pittinsky 2006). For example, in a decision-making task, narcissistic leaders were found to inhibit group-level information exchange, which in turn reduced the quality of team decision-making (Nevicka et al. 2011).

Another negative aspect of narcissistic individuals includes their propensity to behave unethically. Prior research has linked narcissistic leaders to unethical behavior (Amernic and Craig 2010; Blickle et al. 2006; Sedikides and Campbell 2017; Watts et al. 2013). Furthermore, their unethical behavior has a demoralizing effect on other employees. Narcissists rely on unfair inequitable exchanges to achieve desired outcomes, and because in an organizational context they are embedded in a network and interconnected with other employees, their unethical tendencies can have a ripple effect on others (O'Boyle et al. 2012). Therefore, their low ethics might have extended detrimental influence: it can contaminate others if left unchecked. Unethical employees tend to create an organizational culture where unethical behavior becomes the norm, especially when leaders or authority figures are misbehaving (Kish-Gephart et al. 2010).

Indeed, narcissists often seem to derail in terms of ethics when in position of authority (Judge et al. 2009; O'Boyle et al. 2012). Results of a meta-analysis show that for individuals in positions of authority, such as managers, leaders, police, and correctional officers, the higher their level of narcissism, the worse their job performance (O'Boyle et al. 2012), and researchers argue that this is because of narcissists' unethical, self-serving, arrogant, and impulsive behaviors. Thus, this relationship might be explained by poor quality of interpersonal relationships and poor decision-making. The functioning of subordinates might also suffer due to narcissistic leaders' unethical tendencies. As leaders, narcissists seem to direct interpersonal deviance toward their subordinates as means to achieving their goals: they regularly belittled their subordinates and exploited their insecurities in an attempt to minimize negative feedback and create dependencies (Grijalva and Harms 2014; House and Howell 1992). For instance, using a sample of athletes and accredited coaches, Matosic et al. (2016) showed that coach narcissism was directly and positively associated with athletes' perceptions of controlling behaviors and more positive attitudes toward doping and was indirectly and positively associated with athletes' reports of frustration of needs for autonomy, competence, and relatedness. Moreover, leaders' narcissism was associated with the frustration of followers' psychological needs such as needs for autonomy, competence, and relatedness (Matosic et al. 2016).

Narcissistic Leaders and the Importance of Context

Given the aforementioned mixture of potentially positive as well as potentially negative characteristics inherent in narcissistic leaders, in order to determine whether and when narcissistic leaders are a positive or negative force for those they lead, it is important to consider contextual factors. One such factor is the progression of time. According to the contextual reinforcement model (Campbell et al. 2011), leader narcissism is beneficial in the "emerging zone" (i.e., in new leadership positions, short-term contexts) and harmful in the "enduring zone" (i.e., long-held leadership positions, long-term contexts). The problem, however, is that emerging situations become enduring, and over time the more toxic aspects of narcissistic leaders may overshadow their charisma and confidence that seemed so alluring in the short term. For example, narcissists' overconfidence can lead to reckless

risk-taking, which in the long term could have negative financial ramifications for the organization.

The more recent Sedikides and Campbell (2017) Energy Clash Model (ECM) further refines the dynamics of interplay between narcissistic leaders and organizations. It outlines the narcissistic organizational trajectory using phase/state physics metaphor. Narcissism is conceptualized as a force that enters into or emerges in a stable system (i.e., organization) as a leader, destabilizes it through waves of excitement, proposed reforms, and an inspiring vision for organization's future (*perturbation*). Next, with the passage of time, as organizational costs – in terms of human resources and monetary losses due to their risky financial and unethical decisions – accrue and systemic awareness and alertness intensify, it meets resistance and clashes directly with the organization (*conflict*) and stabilizes it at a different state (when the leader is accommodated) or is expelled (*resolution*). Thus, the idea is that over time those who are led by the narcissistic leader as well as other members of the organization become aware of narcissistic leader's toxic characteristics, such as their lack of empathy, hostility, dismissal of expert advice, and inability to deal with criticism and their unethical inclinations. Research has indeed shown that while narcissists make positive first impressions because of their charm and humor, these evaluations deteriorate over time as others become aware of narcissists' negative characteristics. Consequently, narcissists' popularity as well as leadership status decreases (Czarna et al. 2016; Leckelt et al. 2015; Ong et al. 2016). In turn the organization is then required to deal with such a leader and can either try to accommodate their presence (e.g., enhancing accountability measures, trying to ensure goal-congruency between the leader's and organizational interests) or get rid of the narcissistic leader altogether. Narcissists' impulsivity might even mean that they leave of their own accord when they get bored.

In both of these theoretical models, time played a crucial role in the typical "trajectory" of a narcissistic leader, initially accompanying him/her to heights of popularity and effectiveness and then back to the bottom. Research examining other contextual factors has further distilled the circumstances that are most favorable (or unfavorable) to the effectiveness of narcissistic leaders. In particular, times of uncertainty appeared to be convenient to narcissistic individuals, serving as a catalyst in their emergence to leadership positions and as a reinforcement of their effectiveness. Narcissistic leaders bring confidence, toughness, boldness, vision, and innovation into the decision-making process, which might be especially valued in times of organizational uncertainty, i.e., lost market share, unpredictable work environment, and high employee stress (Campbell et al. 2011; Nevicka et al. 2013; Sedikides and Campbell 2017). In times of uncertainty or crises, narcissists might be perceived as suitable leaders because they seem capable of reducing the uncertainty.

It is also possible that narcissistic leaders are more effective in specific types of industries but ineffective in others. For example, they may be effective in dynamic, high-discretion industries as fashion, media, or entertainment but may be ineffective in stable, low-discretion industries such as insurance or utilities (Chatterjee and Hambrick 2007). They may likewise be effective in domains where confidence, persuasiveness, extraversion, and self-absorption are highly relevant (e.g., sales and academia; Sedikides and Campbell 2017) but ineffective in domains that require relationship building and trust (e.g., life-saving, nursing; Rosenthal and Pittinsky 2006). Finally, they may be effective in domains that reward self-promotion and manipulativeness (e.g., politics; Watts et al. 2013).

Ethical climate of an organization is another contextual factor crucial for the effectiveness of narcissistic leaders. As mentioned before, narcissistic leaders' unethical behavior might have an extended detrimental influence on the organization via role modeling. By setting a poor example, narcissistic leaders may negatively impact the culture of an organization by changing its ethical climate. Thus, unsurprisingly, organizations with a lower ethical climate become more hospitable for narcissistic leaders. Research found that the deleterious effects of narcissism on ethical leadership became more pronounced and salient in

highly ethical contexts but remained undetectable in unethical contexts (Hoffman et al. 2013). Although the presence of an ethical climate does not prevent unscrupulous behaviors of narcissistic leaders from occurring, it does make them more visible and, therefore, detectable to other group members. With regard to visibility of narcissistic leaders' behavior, prior research similarly found that leader distance influenced the perceived effectiveness of narcissistic leaders (Nevicka et al. 2018b). When followers had fewer opportunities to observe their leader's behavior and thus had less exposure to their toxic characteristics, for example, due to a greater number of hierarchical levels between the leader and the follower, they perceived narcissistic leaders as effective and reported positive job attitudes. However, this positive relationship disappeared when the leader was more visible to the followers. Related to this, organizations with narcissistic CEOs have been found to have a higher manager turnover (Resick et al. 2009). This again could stem from the fact that narcissists' toxic characteristics would be especially potent for those who are most proximal to them in the workplace, namely, their direct subordinates.

Interestingly, recent research suggests that despite these toxic behaviors, leaders' narcissism might actually benefit the objective and subjective career success of certain subordinates and might have no adverse effects on their well-being (Volmer et al. 2016). It is plausible that by promoting their subordinates' careers narcissistic leaders attempt to retain loyal subordinates in order to obtain continuing admiration and gratitude from them, essentially using them as "narcissistic supplies." These followers would then benefit indirectly from the narcissistic leaders' insatiable desire for constant adoration and ego boosts. Nevertheless, these benefits would be reserved exclusively for the most loyal and sufficiently submissive, admiring subordinates whose devotion to the leader might at the same time leave them defenseless and vulnerable to his/her whims and changing moods (Czarna et al. 2018). In a similar vein, Grijalva and Harms (2014) developed their Narcissistic Leaders and Dominance Complementarity Model to better understand what kind of followers would work most effectively with narcissistic leaders. They predicted that submissive (rather than dominant) followers would work more harmoniously with narcissistic leaders and that the leader-follower relationship would be more satisfying and productive for both parties. However, other scholars (Padilla et al. 2007) suggested that these submissive individuals might be vulnerable to narcissists' exploitative tendencies. Recent research showed that followers low on self-esteem or low on core self-evaluations suffered most from narcissistic leaders as they perceived them to be abusive and, in turn, these followers showed reduced performance and more burnout symptoms when working for such leaders. Followers low on self-esteem are more insecure and more in need of approval from their supervisor and thus also make for "easier targets" (Nevicka et al. 2018a). Thus, despite the fact that collaboration with more submissive followers might be preferable for narcissistic leaders as they do not need to experience power conflict with dominant subordinates, this may come at a cost to the followers themselves. Thus, how follower characteristics fit with those of a narcissistic leader might require further investigation: when and under what circumstances follower's loyalty and submission to a leader work synergistically with the leader's narcissism to bring benefits to both parties and when it becomes a hindrance and a hazard to the well-being of the followers.

Conclusion

So how can we best harness the positive side of narcissistic leaders, while curbing their negative side? In the above we have provided some examples of contextual factors that could serve as a switch between the adaptive and maladaptive influence of narcissistic leaders. Additionally, organizational safeguards such as checks and balances and executive training can be used to keep narcissistic leaders under control (Grijalva and Harms 2014). According to the Energy Clash Model, narcissistic energy, when managed and directed properly either at structural or systemic

level (through implementing systemic checks and balances via accountability, instituting synergistic leadership, increasing leader-organization identification) or at an individual or interpersonal level (introducing micro-interventions, initiating personal development through coaching, strengthening the leader-employee fit) may contribute to organizational innovation and evolution (Sedikides and Campbell 2017). Under these conditions, with checks and balances securing the ethical culture, mutual respect, and civility in the workplace, narcissistic leaders could achieve an optimal level of functioning and significantly contribute to their organizations. Thus, in a well-controlled environment and in the right context a leader characterized by this apparently aversive trait can become an asset rather than a liability to the organization.

Cross-References

- ▶ Dark Personality Features and Employment
- ▶ Manipulativeness
- ▶ Narcissism
- ▶ Narcissistic Personality Inventory
- ▶ Personality and Leadership
- ▶ Personality, Personnel Selection, and Job Performance
- ▶ Political Leadership

Acknowledgments The present work was supported by grant no. 2015/19/B/HS6/02214 from the National Science Center, Poland, awarded to the first author.

References

Allen, T. D., Johnson, H. A. M., Xu, X., Biga, A., Rodopman, O. B., & Ottinot, R. C. (2009). Mentoring and protégé narcissistic entitlement. *Journal of Career Development, 35*, 385–405.

Amernic, J. H., & Craig, R. J. (2010). Accounting as a facilitator of extreme narcissism. *Journal of Business Ethics, 96*, 79–93.

Blair, C. A., Hoffman, B. J., & Helland, K. R. (2008). Narcissism in organizations: A multisource appraisal reflects different perspectives. *Human Performance, 21*, 254–276.

Blickle, G., Schlegel, A., Fassbender, P., & Klein, U. (2006). Some personality correlates of business white-collar crime. *Applied Psychology, 55*, 220–233.

Böckler, A., Sharifi, M., Kanske, P., Dziobek, I., & Singer, T. (2017). Social decision making in narcissism: Reduced generosity and increased retaliation are driven by alterations in perspective-taking and anger. *Personality and Individual Differences, 104*, 1–7.

Bushman, B. J., & Baumeister, R. F. (1998). Threatened egotism, narcissism, self-esteem, and direct and displaced aggression: Does self-love or self-hate lead to violence? *Journal of Personality and Social Psychology, 75*, 219–229.

Campbell, W. K., Hoffman, B. J., Campbell, S. M., & Marchisio, G. (2011). Narcissism in organizational contexts. *Human Resource Management Review, 21*, 268–284.

Chatterjee, A., & Hambrick, D. C. (2007). It's all about me: Narcissistic chief executive officers and their effects on company strategy and performance. *Administrative Science Quarterly, 52*, 351–386.

Czarna, A. Z., Leifeld, P., Śmieja, M., Dufner, M., & Salovey, P. (2016). Do narcissism and emotional intelligence win us friends? Modeling dynamics of peer popularity using inferential network analysis. *Personality and Social Psychology Bulletin, 42*, 1588–1599.

Czarna, A. Z., Zajenkowski, M., & Dufner, M. (2018). How does it feel to be a narcissist? Narcissism and emotions. In A. Hermann, A. Brunell, & J. Foster (Eds.), *Handbook of trait narcissism* (pp. 255–263). Cham: Springer.

Fox, S., & Stallworth, L. E. (2010). The battered apple: An application of stressor-emotion-control/support theory to teachers' experience of violence and bullying. *Human Relations, 63*, 927–954.

Giacomin, M., & Jordan, C. H. (2018). Misperceiving grandiose narcissism as self-esteem: Why narcissists are well-liked at zero acquaintance. *Journal of Personality*. https://doi.org/10.1111/jopy.12436.

Grijalva, E., & Harms, P. D. (2014). Narcissism: An integrative synthesis and dominance complementarity model. *Academy of Management Perspectives, 28*, 108–127.

Grijalva, E., Harms, P. D., Newman, D. A., Gaddis, B. H., & Fraley, R. C. (2015). Narcissism and leadership: A meta-analytic review of linear and nonlinear relationships. *Personnel Psychology, 68*, 1–47.

Herschcovis, M. S., & Barling, J. (2010). Towards a multi-foci approach to workplace aggression: A meta-analytic review of outcomes from different perpetrators. *Journal of Organizational Behavior, 31*, 24–44.

Hoffman, B. J., Strang, S. E., Kuhnert, K. W., Campbell, W. K., Kennedy, C. L., & LoPilato, A. C. (2013). Leader narcissism and ethical context: Effects on ethical leadership and leader effectiveness. *Journal of Leadership & Organizational Studies, 20*, 25–37.

House, R. J., & Howell, J. M. (1992). Personality and charismatic leadership. *The Leadership Quarterly, 3*, 81–108.

Judge, T. A., Piccolo, R. F., & Kosalka, T. (2009). The bright and dark sides of leader traits: A review and theoretical extension of the leader trait paradigm. *The Leadership Quarterly, 20*, 855–875.

Kashmiri, S., Nicol, C. D., & Arora, S. (2017). Me, myself, and I: Influence of CEO narcissism on firms'

innovation strategy and the likelihood of product-harm crises. *Journal of the Academy of Marketing Science, 45*, 633–656.

Kausel, E. E., Culbertson, S. S., Leiva, P. I., Slaughter, J. E., & Jackson, A. T. (2015). Too arrogant for their own good? Why and when narcissists dismiss advice. *Organizational Behavior and Human Decision Processes, 131*, 33–50.

Kish-Gephart, J. J., Harrison, D. A., & Treviño, L. K. (2010). Bad apples, bad cases, and bad barrels: Meta-analytic evidence about sources of unethical decisions at work. *Journal of Applied Psychology, 95*, 1–31.

Leckelt, M., Küfner, A. C. P., Nestler, S., & Back, M. D. (2015). Behavioral processes underlying the decline of narcissists' popularity over time. *Journal of Personality and Social Psychology, 109*, 856–871. https://doi.org/10.1037/pspp0000057.

Liu, D., Ainsworth, S. E., & Baumeister, R. F. (2016). A meta-analysis of social networking online and social capital. *Review of General Psychology, 20*, 369–391.

Lord, R., & Maher, K. (1991). *Leadership and information processing*. New York: Routledge.

Maccoby, M. (2000). Narcissistic leaders: The incredible pros, the inevitable cons. *Harvard Business Review, 78*, 68–78.

Matosic, D., Ntoumanis, N., Boardley, I. D., Stenling, A., & Sedikides, C. (2016). Linking narcissism, motivation, and doping attitudes in sport: A multilevel investigation involving coaches and athletes. *Journal of Sport and Exercise Psychology, 38*, 556–566.

Miller, J. D., Lynam, D. R., Hyatt, C. S., & Campbell, W. K. (2017). Controversies in narcissism. *Annual Review of Clinical Psychology, 13*, 291–315.

Morf, C. C., & Rhodewalt, F. (2001). Unraveling the paradoxes of narcissism: A dynamic self-regulatory processing model. *Psychological Inquiry, 12*(4), 177–196.

Nevicka, B., Ten Velden, F. S., De Hoogh, A. H., & Van Vianen, A. E. (2011). Reality at odds with perceptions: Narcissistic leaders and group performance. *Psychological Science, 22*, 1259–1264.

Nevicka, B., De Hoogh, A. H., Van Vianen, A. E., & Ten Velden, F. S. (2013). Uncertainty enhances the preference for narcissistic leaders. *European Journal of Social Psychology, 43*, 370–380.

Nevicka, B., Baas, M., & Ten Velden, F. S. (2016). The bright side of threatened narcissism: Improved performance following ego threat. *Journal of Personality, 84*, 809–823.

Nevicka, B., De Hoogh, A. H. B., Den Hartog, D. N., & Belschak, F. D. (2018a). Narcissistic leaders and their victims: Followers low on self-esteem and low on core self-evaluations suffer most. *Frontiers in Psychology, 9*, 422.

Nevicka, B., Van Vianen, A. E. M., De Hoogh, A. H. B., & Voorn, B. C. M. (2018b). Narcissistic leaders: An asset or a liability? Leader visibility, follower responses, and group-level absenteeism. *Journal of Applied Psychology, 103*, 703–723.

O'Boyle, E. H., Forsyth, D. R., Banks, G. C., & McDaniel, M. A. (2012). A meta-analysis of the dark triad and work behavior: A social exchange perspective. *Journal of Applied Psychology, 97*, 557–579.

Ong, C. W., Roberts, R., Arthur, C. A., Woodman, T., & Akehurst, S. (2016). The leader ship is sinking: A temporal investigation of narcissistic leadership. *Journal of Personality, 84*, 237–247.

Padilla, A., Hogan, R., & Kaiser, R. B. (2007). The toxic triangle: Destructive leaders, susceptible followers, and conducive environments. *The Leadership Quarterly, 18*, 176–194.

Park, S. W., & Colvin, C. R. (2015). Narcissism and other-derogation in the absence of ego threat. *Journal of Personality, 83*, 334–345.

Resick, C. J., Whitman, D. S., Weingarden, S. M., & Hiller, N. J. (2009). The bright-side and the dark-side of CEO personality: Examining core self-evaluations, narcissism, transformational leadership, and strategic influence. *Journal of Applied Psychology, 94*, 1365–1381.

Rosenthal, S. A., & Pittinsky, T. L. (2006). Narcissistic leadership. *The Leadership Quarterly, 17*, 617–633.

Schoel, C., Stahlberg, D., & Sedikides, C. (2015). Psychological insecurity and leadership styles. In P. J. Carroll, R. M. Arkin, & A. L. Wichman (Eds.), *The handbook of personal security* (pp. 55–73). New York: Psychology Press.

Sedikides, C., & Campbell, W. K. (2017). Narcissistic force meets systemic resistance: The energy clash model. *Perspectives on Psychological Science, 12*, 400–421.

Sedikides, C., Rudich, E. A., Gregg, A. P., Kumashiro, M., & Rusbult, C. (2004). Are normal narcissists psychologically healthy?: Self-esteem matters. *Journal of Personality and Social Psychology, 87*, 400–416.

Stoeber, J., Sherry, S. B., & Nealis, L. J. (2015). Multidimensional perfectionism and narcissism: Grandiose or vulnerable? *Personality and Individual Differences, 80*, 85–90.

Tepper, B. J., Carr, J. C., Breaux, D. M., Geider, S., Hu, C., & Hua, W. (2009). Abusive supervision, intentions to quit, and employees' workplace deviance: A power/dependence analysis. *Organizational Behavior and Human Decision Processes, 109*, 156–167.

Twenge, J. M., & Campbell, W. K. (2003). "Isn't it fun to get the respect that we're going to deserve?" Narcissism, social rejection, and aggression. *Personality and Social Psychology Bulletin, 29*, 261–272.

Volmer, J., Koch, I. K., & Göritz, A. S. (2016). The bright and dark sides of leaders' dark triad traits: Effects on subordinates' career success and Well-being. *Personality and Individual Differences, 101*, 413–418.

Wallace, H. M., & Baumeister, R. F. (2002). The performance of narcissists rises and falls with perceived opportunity for glory. *Journal of Personality and Social Psychology, 82*, 819–834.

Watts, A. L., Lilienfeld, S. O., Smith, S. F., Miller, J. D., Campbell, W. K., Waldman, I. D., … Faschingbauer, T. J. (2013). The double-edged sword of grandiose narcissism: Implications for successful and unsuccessful leadership among US presidents. *Psychological Science, 24*, 2379–2389.Ze

Zeigler-Hill, V., Besser, A., Myers, E. M., Southard, A. C., & Malkin, M. L. (2013). The status-signaling property

of self-esteem: The role of self-reported self-esteem and perceived self-esteem in personality judgments. *Journal of Personality, 81*, 209–220.
Zitek, E. M., & Jordan, A. H. (2016). Narcissism predicts support for hierarchy (at least when narcissists think they can rise to the top). *Social Psychological and Personality Science, 7*, 707–716.

Narcissism and Power

▶ Narcissism and Leadership

Narcissistic Leaders

▶ Narcissism and Leadership

Narcissistic Personality Disorder

Nicole M. Cain and Ayelet Boussi
Long Island University, Brooklyn, NY, USA

Synonyms

Narcissism; Pathological narcissism

Definition

Narcissistic personality disorder (NPD) is characterized by a pervasive pattern of grandiosity, need for admiration, and a lack of empathy. Diagnostic criteria include a preoccupation with fantasies of unlimited power, success, brilliance, beauty, or ideal love, a belief that he/she is "special" or unique, a sense of entitlement, interpersonal exploitativeness, and envy.

Introduction

Narcissistic personality disorder (NPD) is a mental disorder characterized by a pervasive pattern of grandiosity, a deep need for admiration, and a lack of empathy for others that often leads to impairment in functioning in many areas of life, such as work, school, and relationships. Individuals diagnosed with NPD actively seek out self-enhancement experiences from their social environment, are highly sensitive to criticism, and often respond with anger or retaliatory behaviors when they do not receive the admiration or special treatment they believe that they deserve. Estimates suggest a prevalence rate ranging from 0% to 5.3% in community studies (Torgersen et al. 2001) and around 2.3% in clinical populations (Zimmerman et al. 2005). However, investigations across clinical settings suggest that the prevalence rate of NPD may actually be higher in outpatient settings and among clinicians who identify as psychodynamic/psychoanalytic (Levy et al. 2007). Empirical evaluations of NPD have suggested significant problems with the internal consistency, temporal stability, and discriminant validity of the diagnosis. These issues have led theorists and researchers to argue that perhaps the current *Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition* (*DSM-5*; American Psychiatric Association [APA] 2013) NPD criteria do not fully capture the characteristics of patients with pathological narcissism. In fact, reviews of the clinical, psychiatric, and social/personality psychology literature suggest a broader picture of pathological narcissism that encompasses two phenotypic presentations, narcissistic grandiosity and narcissistic vulnerability (Cain et al. 2008; Pincus and Lukowitsky 2010). Narcissistic grandiosity is associated with entitlement, exploitativeness, inflated self-image, aggression, arrogance, and exhibitionism; while, narcissistic vulnerability is associated with helplessness, emptiness, shame, low self-esteem, and social avoidance. Recent research has indicated that individuals with pathological narcissism are most likely to seek psychological treatment when they are high in narcissistic vulnerability as opposed to narcissistic grandiosity (Pincus et al. 2014). However, the psychotherapy literature on pathological narcissism and NPD is sparse. This entry will provide an overview of the current diagnostic criteria for NPD as well as focus on the history of NPD in the *DSM*, review the

characteristics of the disorder as well as highlight empirical evaluations of NPD, and conclude by highlighting the debates surrounding the NPD diagnosis as well as important considerations for treatment.

Current Diagnostic Criteria for Narcissistic Personality Disorder

Narcissistic personality disorder (NPD) is defined in the current edition of the *Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition* (*DSM-5*; APA 2013) as a mental disorder characterized by a pervasive pattern of grandiosity (in fantasy or behavior), need for admiration, and a lack of empathy, beginning by early adulthood and present in a variety of contexts. The indication of five or more of the following nine criteria may warrant the diagnosis of NPD: (1) a grandiose sense of self-importance; (2) a preoccupation with fantasies of unlimited power, success, brilliance, beauty, or ideal love; (3) a belief that he/she is "special" or unique and can only be understood by, and should associate with, other special or high status people or institutions; (4) requires excessive admiration; (5) a sense of entitlement; (6) interpersonal exploitativeness; (7) a lack of empathy;(8) often envious of others or believes that others are envious of him/her; and (9) shows arrogant, haughty behaviors, or attitudes.

A Historical Overview of NPD in the *DSM*

The term narcissism derives from the Greek myth of Narcissus, who mistaking his own image for another, falls in love with that image and dies when it fails to love him back. The construct of narcissism has a long history in psychology and psychiatry, dating back to the writings of Sigmund Freud. The ongoing theoretical debate between Otto Kernberg and Heinz Kohut on the developmental origins and treatment of narcissism, however, sparked its clinical popularity and ultimate inclusion in the *DSM*. Kernberg and Kohut's writings on narcissism were a reaction to increased clinical interest in treating these patients. Their papers, in turn, stimulated increased clinical interest in the concept. However, these clinical trends also paralleled trends in society as well as the identification of narcissism as a personality factor in a number of social psychological studies.

In Kernberg's (1984) view, narcissism develops as a consequence of parental rejection, devaluation, and an emotionally invalidating environment. The child copes with parents who are inconsistent in their investment, or who only relate to the child in order to satisfy their own needs, by defensively withdrawing from their parents and forming a pathologically grandiose image of him/her. By combining aspects of the real self with the fantasized aspects of what the child wants to be, as well as fantasized aspects of an ideal, loving parent, the grandiose self serves as an internal refuge from the harsh and depriving familial environment. The negative self-image of the child is rejected and not integrated into his/her grandiose (likely unrealistic) self-image. For Kernberg, this split-off unacceptable, negative self-image can be seen in the emptiness, chronic hunger for admiration and excitement, and shame that also characterize the narcissist's experience.

In contrast, Kohut (1971) views pathological narcissism as a normal developmental process gone awry. For Kohut, childhood grandiosity is normal and can be understood as a process by which the child attempts to identify with and become like his/her idealized parental figures by taking on attributes of perceived competence and power. In normal development, this early grandiose self becomes modulated and eventually contributes to an integrated sense of self, with realistic ambitions and goals. However, if not properly modulated, what follows is the failure of the grandiose self to be integrated into the individual's whole personality. Others are thus taken as extensions of the self (e.g., self-objects) and are relied upon to regulate one's self-esteem and anxieties. Because narcissists are unable to sufficiently manage the normal affect and self-esteem fluctuations of daily life, other people are unwittingly relegated to roles of providing internal regulation for them (by way of unconditional support, admiration, and total empathic attunement), the same way a parent would provide internal regulation for a young child.

In contrast to Kernberg and Kohut, Millon (1981) articulated a social learning theory of narcissism. Millon viewed narcissism developing not as a response to parental devaluation but rather as a consequence of parental *overvaluation*. According to Millon, as a child, the narcissistic individual was treated as a special person, given much attention, and led by parents to believe he/she is perfect. Millon contends that such unrealistic overvaluation will lead to self-illusions that cannot be sustained in reality. Millon also argues that first-born and only-children are more vulnerable to developing narcissism because they tend to receive an abundance of attention and special treatment. However, the evidence is mixed regarding birth order, and there is no evidence that only-child status or first-born status is related to narcissism.

The introduction of NPD into the third edition of the *DSM (DSM-III)* was based on a review of the theoretical literature on narcissism. The core components identified for inclusion in the NPD diagnosis in *DSM-III* included a grandiose sense of self-importance or uniqueness, preoccupation with fantasies of unlimited success, power, brilliance, beauty or ideal love, exhibitionism, a reaction to criticism characterized by rage, shame or humiliation, or cool indifference, and at least two characteristic interpersonal disturbances, such as entitlement, exploitativeness, idealization alternating with devaluation, or lack of empathy. While not explicitly stated, the discussion and examples of these initial criteria included acknowledgment of more vulnerable aspects of narcissism. For instance, the text of *DSM-III* noted that the grandiose sense of self-importance would alternate with feelings of special unworthiness and that the individual with NPD would have fragile self-esteem, meaning that the individual may be preoccupied with how well he/she is doing and how well he/she is regarded by others. The early diagnostic criteria for NPD assumed an underlying insecurity that was often, but not always, compensated for by overt grandiose behaviors.

Notable changes to the NPD diagnosis from *DSM-III* to *DSM-III-R* to *DSM-IV* included an increased number of criteria emphasizing grandiose themes (Gunderson et al. 1994). For example, *DSM-III-R* separated interpersonal relationship difficulties into three separate grandiose criteria (i.e., exploitativeness, entitlement, and lack of empathy), while eliminating the criterion regarding alternating idealization and devaluation of relationships due to its overlap with borderline personality disorder (BPD) criteria. Grandiosity and uniqueness were also divided into separate criteria and a new criterion reflecting a preoccupation with feelings of envy was added.

Based on a review of the existing research, the authors of *DSM-IV* recommended eliminating the criterion reflecting negative reactions to criticism. While this criterion was initially included in *DSM* based on a review of the psychoanalytic literature examining narcissistic injury, it was determined that the criterion as written did not adequately differentiate NPD from paranoid personality disorder and BPD. Additionally, the lack of empathy criterion was revised to increase discrimination of NPD from the lack of remorse exhibited in antisocial personality disorder (Gunderson et al. 1994; Morey 1988). The envy criterion was also revised based on findings that NPD patients frequently infer that others are envious of them (Gunderson et al. 1994) – increasing its grandiose emphasis. Finally, a review of studies examining the core features of pathological narcissism suggested several grandiose features that were not included in the *DSM-III-R* diagnosis (Morey 1988). This led to a recommendation that a criterion reflecting arrogant, haughty behaviors and/or attitudes be included in the diagnosis of NPD.

The changes to NPD criteria from *DSM-III* to *DSM-IV* demonstrated a better empirical and theoretical understanding of the grandiose aspects of narcissism. However, many of the characteristics underlying vulnerable themes (e.g., shameful reactivity or humiliation in response to narcissistic injury, alternating states of idealization and devaluation) were eliminated as criteria. Instead, these criteria pertaining to vulnerable characteristics were only described in the text of the *DSM-IV* NPD diagnosis, with the caveat that narcissistic individuals may not show these behaviors outwardly. The criteria for NPD were not revised between *DSM-IV* and *DSM-5*.

Empirical Evaluations of *DSM* NPD

The revisions to the NPD diagnosis from *DSM-III* to *DSM-III-R* to *DSM-IV/DSM-5* largely reflect the efforts of the *DSM* taskforce to move away from psychodynamic conceptualizations of narcissism and toward more empirically based criteria. The changes also reflect attempts to differentiate NPD from other personality disorders with which it showed high rates of comorbidity. However, researchers and clinicians have noted that despite these revisions, the NPD diagnosis continues to have questionable clinical utility.

Prevalence The *DSM-IV* taskforce found that the use of NPD as a primary clinical diagnosis is relatively unusual in both outpatient and inpatient settings, and in a Gunderson et al. (1994) study, ranked as the least commonly diagnosed personality disorder. In a review of five community studies examining the prevalence of *DSM-III* and *DSM-III-R* NPD, Mattia and Zimmerman (2001) found that the median prevalence rate of NPD was 0%. In fact, in four of the five studies reviewed, the prevalence of NPD was 0%. Only one study reviewed by Mattia and Zimmerman (2001) reported a prevalence rate of NPD above zero (5.7%). This led the authors to conclude that NPD is the least prevalent personality disorder.

Torgersen et al. (2001) reviewed ten large-scale community epidemiological studies using *DSM-III* and *DSM-III-R* NPD and found that the median prevalence rate for NPD was less than 1%. The prevalence rates in their review ranged from 0% to 5.3%. In addition, a large-scale study examining the prevalence of *DSM-IV* personality disorders in psychiatric outpatients found the prevalence of NPD to be 2.3%, indicating that even in clinical populations the prevalence of NPD is low (Zimmerman et al. 2005). Epidemiological studies of NPD found a higher lifetime prevalence rate for men (7.7%) as compared to women (4.8%; Torgersen et al. 2001).

Investigations of epidemiological and practitioner diagnostic rates suggest that the prevalence of NPD and pathological narcissism likely varies according to clinical setting, type of practice, and theoretical orientation, with those in psychoanalytic/psychodynamic outpatient settings reporting the highest rates of NPD (Levy et al. 2007). For example, Westen (1997) found that 76% of 1901 clinicians (838 identified as psychodynamic, 300 identified as cognitive-behavioral, and 639 identified as eclectic) reported treating patients with NPD. Doidge et al. (2002) surveyed 510 psychoanalytically oriented clinicians, reporting on over 1700 patients in the United States, Canada, and Australia and found that psychoanalysts across the three countries reported that about 20% of their patients suffered from NPD, making it the top-ranked disorder overall in the United States and Canada, and the second-ranked disorder overall in Australia. The differences in prevalence rates between large-scale epidemiological studies and clinician surveys might reflect greater sensitivity to the disorder by psychoanalytic/psychodynamic clinicians or possibly an overdiagnosis of and/or selective attention to, the disorder by these clinicians.

Internal Consistency The internal consistency of *DSM* NPD criteria sets has been examined in a number of studies, with the coefficient alphas ranging from 0.38 to 0.69 for both *DSM-III* and *DSM-III-R* (Morey 1988). These reported coefficient alphas are similar in magnitude to those for other *DSM* personality disorders. However, Morey (1988) indicated that there was a confounding factor in examining the internal consistency of NPD criteria; namely, Morey suggested that the NPD criteria are the most redundant of all the *DSM-III-R* personality disorder criteria sets, suggesting that NPD criteria correlations may actually be artifacts. For example, he argued that the same basic characteristic of high self-esteem is likely reflected by multiple NPD criteria, e.g., grandiosity and entitlement. Thus, while Morey noted that *DSM* NPD has adequate internal consistency, it may be due to a relatively redundant set of criteria.

Examinations of the internal consistency of *DSM-IV* NPD criteria based on self-reports, chart reviews, and diagnostic interviews have also been mixed. For example, while internal consistency coefficients for *DSM-IV* NPD criteria have generally been acceptable, ranging from 0.63 to 0.88,

Blais et al. (1997) noted that five of nine NPD criteria had unacceptable values with regard to internal consistency, leading these authors to conclude that many of the NPD criteria should be replaced or reworded to improve the internal consistency of the diagnosis.

Temporal Stability Examinations of the temporal stability of NPD have focused both on the categorical diagnosis and the diagnostic and descriptive features of NPD. One assumption of the *DSM* personality disorder diagnoses is that personality disorders reflect *enduring* patterns of cognition, affective experience, and behavior. Ronningstam et al. (1995) investigated changes in narcissistic features in 20 patients diagnosed with NPD over a 3-year period and found only modest diagnostic stability. Specifically, they investigated the stability of meeting diagnostic threshold for NPD using the *Diagnostic Interview for Narcissism* (DIN), *DSM-III-R* criteria, and *DSM-IV* criteria. Only 33% of patients who met DIN criteria for NPD at baseline were also above threshold at follow-up. The stability of *DSM-III-R* diagnoses (50%) and *DSM-IV* diagnoses (46%) were slightly higher. Importantly, the NPD feature of having a grandiose sense of self-importance exhibited the highest level of instability from baseline to follow-up, which is concerning given that this is considered to be a hallmark of the disorder.

Discriminant Validity There have been several studies examining the ability of *DSM-III* and *DSM-III-R* criteria to discriminate NPD from other personality disorders. Morey (1988) reported that *DSM-III-R* NPD had the most diagnostic overlap of any of the personality disorders. He reported that NPD overlapped 53.1% with histrionic personality disorder, 46.9% with BPD, 35.9% with paranoid personality disorder, and 35.9% with avoidant personality disorder. In contrast, Ronningstam and Gunderson (1989) found that 5 of 9 *DSM-III-R* NPD criteria exhibited good discriminant validity, meaning these NPD criteria could distinguish between NPD and other personality disorder diagnoses: grandiose sense of self, uniqueness, grandiose fantasies, entitlement, and need for admiration. Ronningstam and Gunderson (1991) used the DIN to investigate whether *DSM-III-R* NPD criteria could differentiate NPD from BPD and found that only three *DSM-III-R* criteria (grandiose sense of self, grandiose fantasies, and uniqueness) could differentiate between the two diagnoses. Finally, Levy et al. (2007) noted that research shows that the rate of overlap for *DSM-III* and *DSM-III-R* NPD with other personality disorders was in excess of 50%, due to high diagnostic comorbidity.

Research has also focused on evaluating whether the recommended changes in NPD criteria from *DSM-III-R* to *DSM-IV* improved the discriminant validity of the diagnosis. In their study using patient ratings of all *DSM-IV* personality disorder criteria, Blais and Norman (1997) found that while discriminant validity was generally poor for all personality disorder diagnoses, NPD was among the worst performers. Holdwick et al. (1998) retrospectively examined the charts of outpatients meeting *DSM-IV* criteria for NPD, BPD, and antisocial personality disorder. The NPD criteria that best distinguished it from antisocial PD were fantasies of unlimited success, belief that he/she is special or unique, and requires excessive admiration. The NPD criteria reflecting interpersonal exploitativeness and lack of empathy did not discriminate NPD patients from antisocial PD patients. Holdwick et al. (1998) also found that NPD appeared more distinct from BPD than from antisocial PD. For example, the NPD criteria that distinguished it from BPD included grandiose sense of self-importance, arrogant or haughty behaviors or attitudes, belief that he/she is special or unique, and requires excessive admiration. The NPD criteria reflecting fantasies of unlimited success, interpersonal exploitativeness, and is often envious of others or believes others are envious of him/her did not discriminate NPD patients from BPD patients. Overall, the NPD criteria that best distinguished it from BPD and antisocial PD were those emphasizing grandiosity: a grandiose sense of self-importance, a belief that he/she is special or unique, entitlement, and arrogant or haughty attitudes or behaviors.

More recently, Fossati et al. (2005) reported that *DSM-IV* NPD exhibited adequate discriminant validity in their sample of 641 outpatients who were administered the *Structured Clinical Interview for DSM-IV Axis II Personality Disorders* (SCID-II) and the SCID-II Personality Questionnaire. The two criteria that best predicted the NPD diagnosis were arrogant, haughty attitudes/behaviors, and lack of empathy. The three criteria that were the worst predictors of the NPD diagnosis included grandiose fantasies, need for excessive admiration, and preoccupation with envy.

Taken together, empirical evaluations of *DSM* NPD suggest potential problems with internal consistency, temporal stability, and discriminant validity. While these problems are not unique to the NPD diagnosis, the additional inconsistencies between NPD prevalence in epidemiological studies and NPD prevalence in clinical practice seem to suggest that the limitations of the NPD diagnosis may go beyond those common to most personality disorders. This has led theorists and researchers to argue that perhaps the *DSM* NPD criteria do not fully capture the characteristics of patients who are considered pathologically narcissistic by clinicians in practice.

Debates Surrounding the NPD Diagnosis

Moving beyond *DSM* NPD, extensive reviews of the clinical, psychiatric, and social/personality psychology literature clearly paint a broader portrait of pathological narcissism as encompassing two phenotypic presentations, narcissistic grandiosity and narcissistic vulnerability (Cain et al. 2008; Pincus and Lukowitsky 2010). Narcissistic grandiosity is associated with entitlement, exploitativeness, inflated self-image, aggression, arrogance, and exhibitionism, while narcissistic vulnerability is associated with helplessness, emptiness, shame, low self-esteem, and social avoidance. Theorists and researchers note that *DSM* NPD criteria have become increasingly narrow in scope with each successive edition of the manual and currently only capture predominantly grandiose themes of the disorder, while eliminating many of the clinically meaningful characteristics associated with narcissistic vulnerability (Pincus and Lukowitsky 2010). In fact, many features associated with vulnerable themes (e.g., shameful reactivity or humiliation in response to narcissistic injury, alternating states of idealization and devaluation) were eliminated as criteria entirely. The overly narrow construct definition of narcissism found in *DSM* NPD limits its clinical validity and utility, as it appears that therapists and diagnosticians may be more likely to see narcissistic patients when they are experiencing more vulnerable features, such as emptiness and shame (Levy et al. 2007; Pincus et al. 2009). Thus, a clinician relying solely on *DSM* NPD diagnostic criteria may fail to recognize pathological narcissism in a patient who presents for treatment. This has led to theorists, researchers, and clinicians calling for subsequent editions of the *DSM* to include criteria to adequately assess both narcissistic grandiosity and narcissistic vulnerability.

Due to the numerous critiques of the *DSM* NPD diagnosis, initial proposals for *DSM-5* indicated that NPD would be deleted as a personality disorder diagnosis. Rather than including NPD as a diagnosis in its own right, characteristics of pathological narcissism and NPD were to be captured through dimensional ratings of five personality disorder types (antisocial, avoidant, borderline, obsessive-compulsive, and schizotypal) and six higher order personality trait domains (negative emotionality, introversion, antagonism, disinhibition, compulsivity, and schizotypy). The researchers leading the proposed changes for *DSM-5* made several arguments for this. They argued that the proposed revisions would reduce the excessive co-occurrence among personality disorder diagnoses, provide official recognition that many forms of personality pathology occur on a continuum, and replace the unstable behavioral personality disorder criteria with personality traits that are more stable over time, thus providing a richer and more clinically useful portrayal of personality pathology and narcissistic functioning (Levy et al. 2013).

However, many found the proposed *DSM-5* model to be cumbersome and potentially difficult for clinicians to use with its combined prototype

matching and personality trait dimensional rating scales. With regard to NPD, Miller et al. (2010) argued that essential traits for conceptualizing narcissism, such as maladaptive extraversion, maladaptive agreeableness, and maladaptively low neuroticism, had been excluded. In addition, Widiger (2011) argued that, while *DSM-IV* NPD has a low prevalence rate and is poorly researched compared to the other personality disorders slated for retention, a large body of research on the broader construct of narcissism and its importance for diverse outcomes, such as depression, aggression, and suicidal behavior, was omitted from *DSM-5* as well as its higher prevalence in clinical practice than the current *DSM-IV* criteria capture. Ultimately, the *DSM-5* taskforce retained the *DSM-IV* diagnostic criteria for NPD and moved the proposed revisions to Section III (e.g., disorders requiring further study) of the manual. Further research is needed on this proposed model to examine whether it will adequately address the limitations associated with the *DSM* NPD diagnosis.

Treatment Considerations for NPD

While there is no single treatment model for NPD, there are several important factors to consider in treatment planning and assessment. First, narcissism has historically been considered a treatment-resistant disorder. Clinicians have argued that due to the nature of the interpersonal difficulties associated with NPD (e.g., entitlement, exploitativeness), it is difficult for these patients to remain in treatment. However, recent research has indicated that individuals with pathological narcissism are most likely to seek psychological treatment when they are high in narcissistic vulnerability (Pincus et al. 2014). This is in contrast to narcissistic grandiosity, which often inhibits patients from seeking treatment. Second, because the *DSM* NPD diagnosis focuses primarily on the grandiose aspects of narcissism and less on the vulnerable aspects, a clinician who is using the *DSM-5* criteria alone may fail to accurately assess pathological narcissism in a new patient (Pincus et al. 2014; Pincus and Lukowitsky 2010). Research has shown that narcissistic patents often present to treatment with complaints of envy, aggression, helplessness, low self-esteem, shame, social avoidance, and suicidality, while the hallmark symptoms associated with narcissistic grandiosity (e.g., exploitativeness, exhibitionism) tend to emerge later as the therapeutic relationship evolves (Pincus et al. 2014).

Despite being regularly diagnosed by clinicians in practice, the psychotherapy literature on narcissism is quite sparse; in particular, there is little systematic follow-up information on narcissistic patients. Levy et al. (2007) conducted an extensive review of the treatment literature for NPD and found that the research on long-term course and outcome produced mixed results. For instance, Plakun (1989) found that NPD patients were more likely to have multiple psychiatric hospitalizations and poorer overall functioning and poorer sexual satisfaction as compared to patients diagnosed with BPD. In contrast, McGlashan and Heinssen (1989) found that over time in treatment, individuals with NPD actually show decreases in destructive interpersonal behaviors.

Levy et al. (2007) also reported that there are no randomized controlled treatment studies on NPD. There are a number of psychotherapy studies of patients with a specific personality disorder, a subset of personality disorders, personality disorders in general, or major mental disorders (e.g., depression and anxiety) that have included patients with NPD. However, these controlled studies are difficult to interpret because they focused on mixed types of personality disorders, without specifically examining narcissistic cohorts. One exception is a naturalistic study by Teusch et al. (2001), which examined the effects of client-centered psychotherapy (CCT) for personality disorders, alone and in combination with psychopharmacological treatment. For NPD, they found that CCT as compared with CCT + medication led to greater reductions in depression. The authors hypothesized that given the difficulties with medication compliance among patients with personality pathology, it is possible that the medication regiments actually had a negative effect on patient outcome for NPD and other personality disorders. In addition, Callaghan et al. (2003)

presented single-subject data on a patient diagnosed with histrionic and NPD behaviors who was treated with psychoanalytic psychotherapy. They reported significant changes in NPD behaviors during the psychotherapy sessions; however, the researchers did not assess any external outcomes and thus in-session changes were not linked to any external measures of improvement. Thus, more research is needed on the psychological treatment of NPD.

Conclusion

In sum, narcissistic personality disorder (NPD) is a mental disorder characterized by a pervasive pattern of grandiosity, a deep need for admiration, and a lack of empathy for others that often leads to impairment in functioning in many areas of life, such as work, school, and relationships. Extensive reviews of the clinical, psychiatric, and social/personality psychology literature suggest a broader picture of pathological narcissism that encompasses two phenotypic presentations, narcissistic grandiosity and narcissistic vulnerability (Cain et al. 2008; Pincus and Lukowitsky 2010). Recent research has indicated that individuals with pathological narcissism are most likely to seek psychological treatment when they are high in narcissistic vulnerability (Pincus et al. 2014). However, the psychotherapy literature on pathological narcissism and NPD is sparse.

Cross-References

- ▶ Five-Factor Narcissism Inventory
- ▶ Narcissism
- ▶ Narcissistic Personality Inventory
- ▶ Pathological Narcissism Inventory
- ▶ Personality Disorder

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Blais, M. A., & Norman, D. K. (1997). A psychometric evaluation of the DSM-IV personality disorder criteria. *Journal of Personality Disorders, 11*, 168–176.

Blais, M. A., Holdwick, M. J., & Castlebury, F. D. (1997). Content validity of the DSM-IV borderline and narcissistic personality disorder criteria sets. *Comprehensive Psychiatry, 38*, 31–37.

Cain, N. M., Pincus, A. L., & Ansell, E. B. (2008). Narcissism at the crossroads: Phenotypic description of pathological narcissism across clinical theory, social/personality psychology, and psychiatric diagnosis. *Clinical Psychology Review, 28*, 638–656.

Callaghan, G. M., Summers, C. J., & Weidman, M. (2003). The treatment of histrionic and narcissistic personality disorder behaviors: A single-subject demonstration of clinical improvement using functional analytic psychotherapy. *Journal of Contemporary Psychotherapy, 33*, 321–339.

Doidge, N., Simon, B., Brauer, L., Grant, D., First, M., Brunshaw, J., Lancee, W., Stevens, A., Oldham, J., & Mosher, P. (2002). Psychoanalytic patients in the U.S., Canada, and Australia: I. DSM-III-R disorders, indications, previous treatment, medications, and length of treatment. *Journal of the American Psychoanalytic Association, 50*, 575–614.

Fossati, A., Beauchaine, T. P., Grazioli, F., Carretta, I., Cortinovis, F., & Maffei, C. (2005). A latent structure analysis of diagnostic and statistical manual of mental disorders, fourth edition, narcissistic personality disorder criteria. *Comprehensive Psychiatry, 46*, 361–367.

Gunderson, J., Ronningstam, E., & Smith, L. E. (1994). Narcissistic personality disorder. In T. A. Widiger (Ed.), *DSM-IV sourcebook* (Vol. 1, pp. 745–756). Washington DC: American Psychiatric Press.

Holdwick, D. J., Hilsenroth, M. J., Castlebury, F. D., & Blais, M. A. (1998). Identifying the unique and common characteristics among the DSM-IV antisocial, borderline, and narcissistic personality disorders. *Comprehensive Psychiatry, 39*, 277–286.

Kernberg, O. F. (1984). *Severe personality disorders: Psychotherapeutic strategies*. New Haven: Yale University Press.

Kohut, H. (1971). *The analysis of the self*. New York: International Universities Press.

Levy, K. N., Reynoso, J., Wasserman, R. H., & Clarkin, J. F. (2007). Narcissistic personality disorder. In W. O'Donohue, K. A. Fowler, & S. O. Lilienfeld (Eds.), *Personality disorders: Toward the DSM-V* (pp. 233–277). Thousand Oaks: Sage.

Levy, K. N., Meehan, K. B., Cain, N. M., & Ellison, W. D. (2013). Narcissism in the DSM. In J. S. Ogrodniczuk (Ed.), *Understanding and treating pathological narcissism* (pp. 45–62). Washington, DC: American Psychological Association.

Mattia, J. I., & Zimmerman, M. (2001). Epidemiology. In W. J. Livesley (Ed.), *Handbook of personality disorders: Theory, research and treatment* (pp. 107–123). New York: Guilford Press.

McGlashan, T. H., & Heinssen, R. K. (1989). Narcissistic, antisocial, and non-comorbid subgroups of borderline disorder. Are they distinct entities by long-term clinical profiles? *Psychiatric Clinics of North America, 12*, 621–641.
Miller, J. D., Widiger, T. A., & Campbell, W. K. (2010). Narcissistic personality disorder and the DSM-V. *Journal of Abnormal Psychology, 119*, 640–649.
Millon, T. (1981). *Disorders of personality: DSM-III Axis I*. New York: Wiley.
Morey, L. C. (1988). A psychometric analysis of the DSM-III-R personality disorder criteria. *Journal of Personality Disorders, 2*, 109–124.
Pincus, A. L., & Lukowitsky, M. R. (2010). Pathological narcissism and narcissistic personality disorder. *Annual Review of Clinical Psychology, 6*, 1–8.
Pincus, A. L., Ansell, E. B., Pimentel, C. A., Cain, N. M., Wright, A. G., & Levy, K. N. (2009). Initial construction and validation of the pathological narcissism inventory. *Psychological Assessment, 21*, 365–379.
Pincus, A. L., Cain, N. M., & Wright, A. G. C. (2014). Narcissistic grandiosity and narcissistic vulnerability in psychotherapy. *Personality Disorders: Theory, Research, Treatment, 5*, 439–443.
Plakun, E. M. (1989). Narcissistic personality disorder: A validity study and comparison to borderline personality disorder. *Psychiatric Clinics of North America, 12*(3), 603–620.
Ronningstam, E., & Gunderson, J. (1989). Descriptive studies on narcissistic personality disorder. *Psychiatric Clinics of North America, 12*, 585–601.
Ronningstam, E., & Gunderson, J. (1991). Differentiating borderline personality disorder from narcissistic personality disorder. *Journal of Personality Disorders, 5*, 225–232.
Ronningstam, E., Gunderson, J., & Lyons, M. (1995). Changes in pathological narcissism. *American Journal of Psychiatry, 152*, 253–257.
Teusch, L., Bohme, H., Finke, J., & Gastpar, M. (2001). Effects of client-centered psychotherapy for personality disorders alone and in combination with psychopharmacological treatment. *Psychotherapy and Psychosomatics, 70*, 328–336.
Torgersen, S., Kringlen, E., & Cramer, V. (2001). The prevalence of personality disorders in a community sample. *Archives of General Psychiatry, 58*, 590–596.
Westen, D. (1997). Divergences between clinical and research methods for assessing personality disorders; Implications for research and the evolution of Axis II. *American Journal of Psychiatry, 154*, 895–903.
Widiger, T. A. (2011). A shaky future for personality disorders. *Personality Disorders: Theory, Research, and Treatment, 2,* 54–67.
Zimmerman, M., Rothschild, L., & Chelminski, I. (2005). The prevalence of DSM-IV personality disorders in psychiatric outpatients. *American Journal of Psychiatry, 162*, 1911–1918.

Narcissistic Personality Inventory

Robert A. Ackerman
School of Behavioral and Brain Sciences,
The University of Texas at Dallas, Richardson, TX, USA

Synonyms

NPI

Definition

A popular instrument within social/personality psychology used to assess grandiose expressions of narcissism in nonclinical populations.

Introduction

The Narcissistic Personality Inventory (NPI) is the most widely used measure of narcissism within social/personality psychology. Motivated by the upcoming inclusion of narcissistic personality disorder (NPD) as its own diagnostic entity in the Diagnostic and Statistical Manual (DSM)-III, Raskin and Hall (1979) created the NPI to assess narcissism as a trait in nonclinical populations. They used the diagnostic criteria for NPD as the basis for generating 223 forced-choice items wherein participants choose between a "narcissistic" response (e.g., "I really like to be the center of attention") and a "non-narcissistic" response (e.g., "It makes me uncomfortable to be the center of attention"). Internal consistency approaches helped to shorten the NPI into an 80-item version for research (Raskin and Hall 1979).

Subsequent work continued to use an internal consistency approach to further shorten the measure, resulting in a 54-item version that was widely used (e.g., Emmons 1984, 1987). Emmons (1984, 1987) provided important initial validity

evidence for this 54-item version of the NPI. He also applied a combination of Principal Components Analysis and Exploratory Factor Analysis to this version of the NPI and found support for a solution consisting of four dimensions: leadership/authority, exploitativeness/entitlement, superiority/arrogance, and self-absorption/self-admiration. Raskin and Terry (1988) later performed their own evaluation of the dimensionality of the NPI, which resulted in the creation of the 40-item version. This 40-item version is the most widely used iteration of the instrument to date.

Main Text (Headings Chosen by Authors)

Dimensional Structure of NPI

Several dimensional structures have been proposed for the NPI (Ackerman et al. 2011; Corry et al. 2008; Emmons 1984, 1987; Kubarych et al. 2004; Raskin and Terry 1988). The most complex dimensional solution, proposed by Raskin and Terry (1988), contains seven dimensions: authority, vanity, superiority, exploitativeness, exhibitionism, self-sufficiency, and entitlement. The simplest dimensional solutions, by contrast, contain two dimensions: Corry et al. (2008; i.e., leadership/authority and exhibitionism/entitlement) and Kubarych et al. (2004; i.e., power and exhibitionism).

Despite differences in their analytic approaches (e.g., Principal Components Analysis vs. Exploratory Factor Analysis), almost all solutions yield a dimension containing content related to leadership and authority. This suggests that a robust dimension of social potency underlies responses to the instrument. The other more socially aversive content involving exhibitionism and entitlement typically coheres separately from the leadership and authority content (but see Kubarych et al. 2004, for an exception). Some work has found it helpful to further distinguish the exhibitionism content from the entitlement content in light of their divergent relations to internalizing and externalizing outcomes (Ackerman et al. 2011).

Reliability and Validity of NPI

NPI Total Score

The NPI total score generally yields high internal consistency coefficients (α's $\geq$0.80; see, e.g., Ackerman et al. 2011; del Rosario and White 2005; Emmons 1984, 1987; Raskin and Terry 1988; Rosenthal and Hooley 2010). In addition, del Rosario and White (2005) demonstrated that the NPI total score has high test-retest reliability over the course of 13 weeks. The evidence therefore suggests that the NPI total score is a reliable measure.

The NPI total score is positively associated with alternative measures of narcissism and NPD (Rosenthal and Hooley 2010; Rosenthal et al. 2011). It is worth noting, however, that the NPI total score better corresponds to measures that emphasize phenotypic expressions of narcissistic grandiosity rather than narcissistic vulnerability (Ackerman et al. 2011; Maxwell et al. 2011).

Various lines of research show that the NPI total score is linked to an antagonistic interpersonal style. In addition to possessing lower levels of agreeableness (Ackerman et al. 2011; Rhodewalt and Morf 1995), persons with higher NPI total scores also report greater levels of aggression (Emmons 1984; Raskin and Terry 1988; Rosenthal and Hooley 2010; Rosenthal et al. 2011) and hostility (Rhodewalt and Morf 1995), as well as higher levels of psychopathy and Machiavellianism (Ackerman et al. 2011).

Research also shows that the NPI total score is linked to agentic traits and seemingly adaptive outcomes. The NPI total score is consistently associated with greater levels of extraversion (Ackerman et al. 2011; Emmons 1984; Raskin and Terry 1988). Persons with higher scores on the NPI total score also report greater levels of self-esteem (Ackerman et al. 2011; Emmons 1984; Maxwell et al. 2011; Rhodewalt and Morf 1995; Rosenthal and Hooley 2010; Rosenthal et al. 2011), lower levels of neuroticism (Rhodewalt and Morf 1995; but see Ackerman et al. 2011), and better psychological health (Rosenthal and Hooley 2010; Rosenthal et al. 2011).

NPI Subscales

Space constraints prevent this entry from describing the psychometric properties of the components/factors from every dimensional solution. Fortunately, the solutions typically share certain features in common (e.g., a division between the leadership and authority content from the entitlement content). This section will therefore focus on three content areas that typically cohere together in dimensional solutions: leadership/authority, exhibitionism, and entitlement/exploitativeness.

Leadership/Authority. Subscales containing leadership/authority content generally yield satisfactory levels of internal consistency (alpha $>$0.65; Ackerman et al. 2011; del Rosario and White 2005; Maxwell et al. 2011; Raskin and Terry 1988). In addition, these subscales display strong levels of test-retest reliability ($r > 0.75$; del Rosario and White 2005).

Subscales containing leadership/authority content correspond strongly to experts' ratings of grandiose narcissism (Miller et al. 2014). They are also positively related to self-report measures of pathological narcissistic grandiosity (Ackerman et al. 2011; Maxwell et al. 2011) and NPD (Maxwell et al. 2011). Like the NPI total score, however, subscales containing leadership/authority content are virtually unrelated to pathological narcissistic vulnerability (Ackerman et al. 2011; Maxwell et al. 2009).

Persons scoring high on these subscales possess more agentic traits (Ackerman et al. 2011; Corry et al. 2008; Emmons 1984; Miller et al. 2014; Raskin and Terry 1988) and are somewhat less agreeable (Ackerman et al. 2011; Corry et al. 2008; but see Rhodewalt and Morf 1995). They also report lower levels of neuroticism (Emmons 1984; Miller et al. 2014; Rhodewalt and Morf 1995; but see Ackerman et al. 2011) and distress (Rhodewalt and Morf 1995) and higher levels of self-esteem (Ackerman et al. 2011; Emmons 1984; Maxwell et al. 2011).

Exhibitionism. Subscales containing exhibitionism content generally yield somewhat lower levels of internal consistency than subscales containing leadership/authority content (alpha $\approx$ 0.60 or higher; Ackerman et al. 2011; del Rosario and White 2005; Maxwell et al. 2011; Raskin and Terry 1988). Nevertheless, they display strong levels of test-retest reliability ($r > 0.75$; del Rosario and White 2005).

Like leadership/authority, subscales containing exhibitionism content strongly correspond to experts' ratings of grandiose narcissism (Miller et al. 2014). They are also positively related to self-report measures of pathological narcissistic grandiosity (Ackerman et al. 2011; Maxwell et al. 2009) and NPD (Maxwell et al. 2011) and are virtually unrelated to narcissistic vulnerability (Ackerman et al. 2011; Maxwell et al. 2009).

Persons scoring high on these subscales possess more agentic traits (Ackerman et al. 2011; Miller et al. 2014; Raskin and Terry 1988) and slightly higher levels of self-esteem (Ackerman et al. 2011; Maxwell et al. 2011). Nevertheless, they are less agreeable (Ackerman et al. 2011), have less self-control (Ackerman et al. 2011; Raskin and Terry 1988), and report higher levels of psychopathy and Machiavellianism (Ackerman et al. 2011).

Entitlement/Exploitativeness. Subscales with entitlement and/or exploitativeness content generally possess lower levels of internal consistency than subscales with leadership/authority or exhibitionism content (alphas $<$0.55; Ackerman et al. 2011; del Rosario and White 2005; Maxwell et al. 2011; Raskin and Terry 1988). del Rosario and White (2005) further showed that subscales with entitlement or exploitativeness content display weaker levels of test-retest reliability than subscales with leadership/authority or exhibitionism content ($r \leq 0.60$).

Unlike other subscales, subscales containing entitlement and/or exploitativeness content strongly correspond to experts' ratings of vulnerable narcissism (Miller et al. 2014). They also correlate positively with measures of NPD (Emmons 1987; Maxwell et al. 2011), grandiose narcissism (Ackerman et al. 2011; Maxwell et al. 2011; Rosenthal et al. 2011), and vulnerable narcissism (Ackerman et al. 2011; Maxwell et al. 2011).

Subscales containing entitlement or exploitativeness are generally unrelated to extraversion (Ackerman et al. 2011; Miller et al. 2014) and either unrelated or negatively related to explicit

self-esteem (Ackerman et al. 2011; Emmons 1984; Maxwell et al. 2011; Rosenthal et al. 2011). In fact, persons with higher levels of entitlement or exploitativeness have higher levels of neuroticism (Ackerman et al. 2011; Emmons 1984; but see Miller et al. 2014) and experience more perceived hassles (Rhodewalt and Morf 1995) and heightened mood reactivity (Emmons 1987). Subscales containing such content are also linked to an especially antagonistic interpersonal style (Ackerman et al. 2011; Miller et al. 2014; Rhodewalt and Morf 1995).

Conclusion

The NPI is a popular measure of narcissism in social/personality psychology. Nevertheless, it has several psychometric limitations (e.g., ambiguous factor structure, low reliability of subscales including entitlement and exploitativeness). Although the NPI total score shows important connections to alternative measures of narcissism and NPD, the NPI is clearly a multidimensional measure with subscales that evince a relatively distinct patterns of correlates.

References

Ackerman, R. A., Witt, E. A., Donnellan, M. B., Trzesniewski, K. H., Robins, R. W., & Kashy, D. A. (2011). What does the narcissistic personality inventory really measure? *Assessment, 18*, 67–87.

Corry, N., Merritt, R. D., Mrug, S., & Pamp, B. (2008). The factor structure of the narcissistic personality inventory. *Journal of Personality Assessment, 90*(6), 593–600.

Emmons, R. A. (1984). Factor analysis and construct validity of the narcissistic personality inventory. *Journal of Personality Assessment, 48*(3), 291–300.

Emmons, R. A. (1987). Narcissism: Theory and measurement. *Journal of Personality and Social Psychology, 52*(1), 11–17.

Kubarych, T. S., Deary, I. J., & Austin, E. J. (2004). The narcissistic personality inventory: Factor structure in a non-clinical sample. *Personality and Individual Differences, 36*(4), 857–872.

Maxwell, K., Donnellan, M. B., Hopwood, C. J., & Ackerman, R. A. (2011). The two faces of narcissus? An empirical comparison of the narcissistic personality inventory and the pathological narcissism inventory. *Personality and Individual Differences, 50*, 577–582.

Miller, J. D., McCain, J., Lynam, D. R., Few, L. R., Gentile, B., MacKillop, J., & Campbell, W. K. (2014). A comparison of the criterion validity of popular measures of narcissism and narcissistic personality disorder via the use of expert ratings. *Psychological Assessment, 26*, 958–969.

Raskin, R. N., & Hall, C. S. (1979). A narcissistic personality inventory. *Psychological Reports, 45*(2), 590.

Raskin, R. N., & Terry, H. (1988). A principal-components analysis of the narcissistic personality inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology, 54*(5), 890–902.

Rhodewalt, F., & Morf, C. C. (1995). Self and interpersonal correlates of the narcissistic personality inventory: A review and new findings. *Journal of Research in Personality, 29*, 1–23.

del Rosario, P. M., & White, R. M. (2005). The narcissistic personality inventory: Test-tetest stability and internal consistency. *Personality and Individual Differences, 39*(6), 1075–1081.

Rosenthal, S. A., & Hooley, J. M. (2010). Narcissism assessment in social-personality research: Does the association between narcissism and psychological health result from a confound with self-esteem? *Journal of Research in Personality, 44*, 453–465.

Rosenthal, S. A., Montoya, R. M., Ridings, L. E., Rieck, S. M., & Hooley, J. M. (2011). Further evidence of the narcissistic personality Inventory's validity problems: A meta-analytic investigation—response to Miller, Maples, and Campbell (this issue). *Journal of Research in Personality, 45*, 408–416.

Narrative Identity

► Life-Story Approach to Identity

National Character

Anu Realo[1,2] and Jüri Allik[2]
[1]Department of Psychology, University of Warwick, Coventry, UK
[2]Department of Psychology, University of Tartu, Tartu, Estonia

Synonyms

National character stereotypes; National characteristics

Definition

National character refers to shared beliefs or perceptions of personality characteristics common to members of a particular nation held by the members of the nation or by any other group of people.

Introduction

The nations and ethnic groups, just like individuals, are often perceived to have a distinct character which can be described by a set of specific personality traits. Such shared beliefs of personality traits typical to people of a particular nation are called national character or national character stereotypes. National character is a narrower term than national stereotypes which also include beliefs about different physical features, mental abilities, specific skills, or preferences. They are called stereotypes because such beliefs, even if widely shared, are often overgeneralized or inaccurate and do not apply to every member of a nation.

Content, Stability, Accuracy, and Origins

Most of the research on national character has focused on the content, stability, accuracy, and origins of national character stereotypes.

Content. In a seminal study of national character by Katz and Braly (1933), Princeton University students were asked to describe personality traits of 10 ethnic groups. The results indicated that students had distinct beliefs about each of the ethnic groups and that there was a remarkable consensus in their beliefs. For instance, Germans were described as scientifically minded and industrious, while Italians were seen as artistic and impulsive. A more systematic cross-national study of national character was conducted by Dean Peabody (1985) who focused on six target nations – France, Germany, Great Britain, Italy, Russia, and the USA – and showed that the psychological characteristics of different nationalities did indeed differ in fundamental ways. Italians, for instance, were again judged generous, extravagant, spontaneous, and impulsive. There are, however, significant differences between in-group (i.e., autostereotypes) and out-group (i.e., heterostereotypes) national character judgments of certain nations. For example, while Russians describe themselves as averagely conscientiousness people, they are often judged as lazy, impractical, impulsive, and lacking conscientiousness by their neighbors (Realo et al. 2009).

Stability. The national character stereotypes are stable over time, and even significant political or economical events do not radically change their content, at least not in the short term (Hřebíčková and Graf 2014; Realo et al. 2009). For example, the national character stereotypes of Americans – as described by 49 nations around the world – changed very little before and after the Iraq invasion, even in those countries that were very close to the site of the invasion (Terracciano and McCrae 2007). Several replications and extensions of the initial Princeton study (Katz and Braly 1933) have shown that it takes decades to change the content of national character – over the course of the past 60–70 years, many of the national character stereotypes have become more favorable but also more consensual (Madon et al. 2001).

Accuracy. A renewed interest in the accuracy of national character stereotypes was ignited by a 49-nation study of Terracciano et al. (2005) who claimed that there was not even a kernel of truth in the national character stereotypes when using aggregate self-reported personality traits as criteria for accuracy. According to Terracciano et al. (2005), national character stereotypes are social constructions that have little basis in reality. Later studies, however, have contested this view by showing that national character stereotypes are moderately related to assessed personality traits, if all assessments are made using the same measurement instrument (Allik et al. 2010; Hřebíčková and Graf 2014; Lönnqvist et al. 2014; Realo et al. 2009). Congruent with the kernel of truth hypothesis, a high level of agreement between Polish autostereotypes of national character and self-reports of personality have been found at least in three studies (Hřebíčková and Graf 2014; Realo et al. 2009; Terracciano et al. 2005) using different measurement instruments. Thus, national character stereotypes are not necessarily inaccurate, and

their correspondence to national mean levels of personality traits may have various degrees.

Origins. There are multiple sources for the emergence of national character stereotypes, and their origin may vary from nation to nation. For instance, people from physically warmer climates are presumed to be friendlier than those who live in colder climates, whereas people from richer countries are judged as being more task oriented, assertive, and interpersonally cold than people from poorer countries (McCrae et al. 2007). In certain nations, national character stereotypes about one's own nation appear to be formed, at least partly, in reference to a dominant neighboring nation (e.g., USA, Russia). For instance, Canadians see themselves as the mirror image of Americans (Terracciano et al. 2005), whereas Estonians and Finns (Realo et al. 2009) describe themselves as the mirror image of Russians. National character stereotypes may also reflect dominant values of a society (McCrae et al. 2007) or by attributing socially desirable personality traits to typical members of one's nation (Allik et al. 2010).

Conclusion

The content of most of the national character stereotypes is temporarily stable, at least in the short term. National character stereotypes are formed on the basis of different geographical, historical, economic, and social factors, and their origins often differ from nation to nation. National character stereotypes may, but do not necessarily need to, be inaccurate.

Cross-References

- ▶ Personality
- ▶ Personality Traits
- ▶ Stereotypes

References

Allik, J., Mõttus, R., & Realo, A. (2010). Does national character reflect mean personality traits when both are measured by the same instrument? *Journal of Research in Personality, 44*, 62–69. https://doi.org/10.1016/j.jrp.2009.10.008.

Hřebíčková, M., & Graf, S. (2014). Accuracy of national stereotypes in Central Europe: Outgroups are not better than ingroup in considering personality traits of real people. *European Journal of Personality, 28*(1), 60–72. https://doi.org/10.1002/per.1904.

Katz, D., & Braly, K. W. (1933). Racial stereotypes of one-hundred college students. *Journal of Abnormal and Social Psychology, 28*, 280–290.

Lönnqvist, J.-E., Konstabel, K., Lönnqvist, N., & Verkasalo, M. (2014). Accuracy, consensus, in-group bias, and cultural frame shifting in the context of national character stereotypes. *Journal of Social Psychology, 154*(1), 40–58. https://doi.org/10.1080/00224545.2013.843500.

Madon, S., Guyll, M., Aboufadel, K., Montiel, E., Smith, A., Palumbo, P., & Jussim, L. (2001). Ethnic and national stereotypes: The Princeton trilogy revisited and revised. *Personality and Social Psychology Bulletin, 27*(8), 996–1010.

McCrae, R. R., Terracciano, A., Realo, A., & Allik, J. (2007). Climatic warmth and national wealth: Some culture-level determinants of national character stereotypes. *European Journal of Personality, 21*(8), 953–976.

Peabody, D. (1985). *National characteristics*. Cambridge: Cambridge University Press.

Realo, A., Allik, J., Lönnqvist, J.-E., Verkasalo, M., Kwiatkowska, A., Kööts, L., Kütt, M., Barkauskiene, R., Laurinavicius, A., Karpinski, K., Kolyshko, A., Sebre, S., & Renge, V. (2009). Mechanisms of the national character stereotype: How people in six neighbouring countries of Russia describe themselves and the typical Russian. *European Journal of Personality, 23*(3), 229–249. https://doi.org/10.1002/per.719.

Terracciano, A., & McCrae, R. R. (2007). Implications for understanding national character stereotypes. *Journal of Cross-Cultural Psychology, 38*(6), 695–710.

Terracciano, A., Abdel-Khalek, A. M., Adam, N., Adamovova, L., Ahn, C., Ahn, H. N., … , McCrae, R. R. (2005). National character does not reflect mean personality trait levels in 49 cultures. *Science, 310*(5745), 96–100. https://doi.org/10.1126/science.1117199

National Character Stereotypes

▶ National Character

National Characteristics

▶ National Character

Natural Selection

▶ Sexual Selection

Naturalness

▶ Spontaneity

Nature

▶ Personality and Leadership
▶ Temperament

Nature-Nurture Debate

Christian Montag[1,2] and Elisabeth Hahn[3]
[1]Institute of Psychology and Education, Zentrum für Biomedizinische Forschung, Ulm University, Ulm, Germany
[2]Key Laboratory for NeuroInformation/Center for Information in Medicine, School of Life Science and Technology, University of Electronic Science and Technology of China, Chengdu, China
[3]Department of Psychology, Saarland University, Saarbrücken, Germany

Synonyms

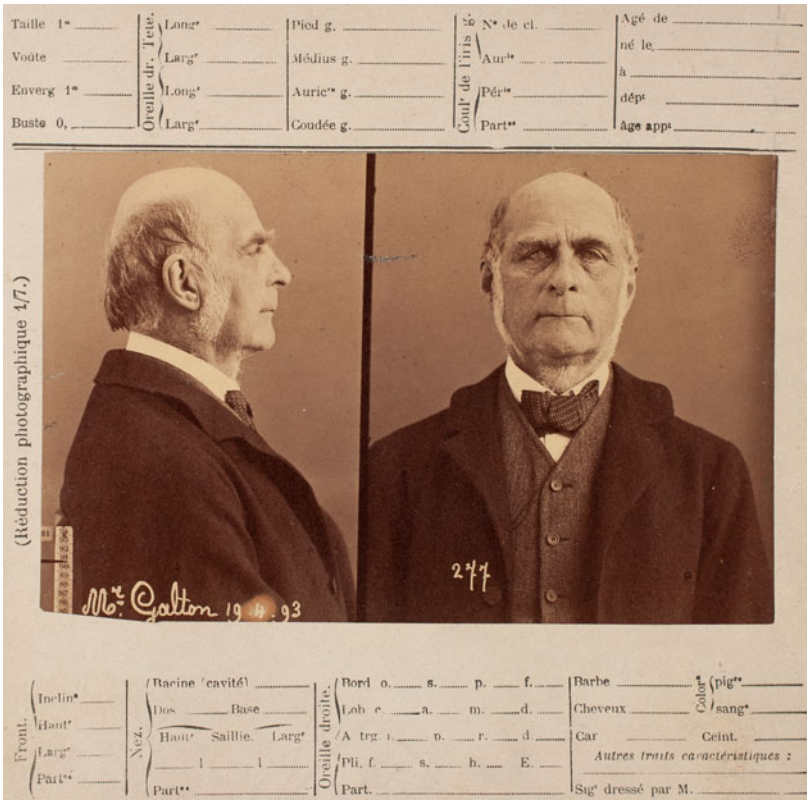
Gene-Environment Interactions; Intelligence; Molecular genetics; Nature; Nurture; Personality

Introduction

Among the earliest testimonials of human civilization is a deep intuition that some aspects of human behavior originate in our genetic makeup, while others feel like the result of upbringing or exercise. A central question posed by both ancient philosophers such as Aristotle and modern researchers in the twenty-first century deals with the impact of nature and nurture on human characteristics such as personality or intelligence. While Aristotle questioned how resemblances between parents and their offspring can be explained (Henry 2006), Sir Francis Galton (1869) as one of the first scientists already dealt in his famous work *Hereditary Genius* with the genetics of intelligence.

The *nature versus nurture debate* represents one of the oldest issues in the research of human behavior dealing with the question whether inherited traits or life experiences (e.g., upbringing) play a greater role in shaping, for example, our personality. The debate centers on the relative contributions of genetic inheritance and environmental factors rather than the absolute impact of these factors to human development. A central paradigm to study the importance of genetics versus environment put forward by Galton was the twin design. Although Galton oversaw many methodological twin study issues in his landmark paper *History of Twins* (Galton 1876), his work clearly made way for using twin designs to get insights into the role of genetics and environment in individual differences in cognitive abilities and personality. For this achievement, Sir Francis Galton is seen by many as the founder of *Behavioral Genetics* (see Fig. 1).

The main idea behind twin studies refers to the simple notion that if persons being related to each other are more similar than non-related individuals, genetics must play a certain role. Although this idea is true to some extent, scientists know for quite some time that shared environmental influences (such as parents showing same parenting style toward their children) can also be a cause for such higher similarities in related individuals (for a detailed description, see Knopik et al. 2016; Hahn and Spinath 2017). Nevertheless, to get an overview on results from twin research in the realm of the life sciences including psychology, it has been underlined by a recent mega-analysis taking a look at 50 years of twin research between 1958 and 2012 – covering more than 14 million twin pairs – that about 50% of individual



Nature-Nurture Debate, Fig. 1 Sir Francis Galton is seen as the founder of *Behavioral Genetics* by many scientists. Moreover he coined the term "nature-nurture" (Gillham 2001). The copyright of Figure 1 has been granted by Subhadra Das by UCL Galton Collection

differences in human traits can be accounted for by genetics (Polderman et al. 2015). This is also in line with data observed in studies stemming from personality research (Jang et al. 1996; Montag et al. 2016; Riemann et al. 1997). Of note, heritability estimates for individual differences in intelligence are even a bit higher than those for individual differences in personality (see review by Arslan and Penke 2015).

The Misunderstanding of Genetic Determinism

One of the major misunderstandings of heritability and the reasons why many laypersons overestimate the importance of genetics for variation in psychological traits could be the existence of monogenetically inherited neurological disorders such as Huntington's disease. Here, carrying a distinct genetic variant on the huntingtin gene results inevitable in the outbreak of this severe movement disorder (e.g., Langbehn et al. 2004). This and similar kind of empirical results from neurology can easily make people believe in a genetic deterministic view ("genes are the only cause for who I am") potentially carrying over to also explain individual differences in psychological phenotypes such as intelligence and personality. As seen in the introduction, this thought is far from the truth, because (a) studies using twin designs proved without doubt that individual differences in these psychological traits are both influenced by nature and nurture (Polderman et al. 2015). Moreover, (b) intelligence and personality are usually normally distributed traits in the population (e.g., see Montag et al. 2012), which speaks for the influence of hundreds of genetic variations interacting with the environment on the mentioned psychological traits. If a genetic deterministic view would be correct, one would expect persons of a population to be either intelligent or not which is not in line with the observed distribution.

How Nature and Nurture Interact

Whereas twin studies clarified that both *nature and nurture* rather than *nature versus nurture* are of tremendous importance to understand individual differences in human behavior, earlier studies in this field suggested to some extent that both the influences of nature and nurture have to be understood as somewhat of distinct entities influencing complex human psychological traits. Recent developments in twin studies as well as evidence from molecular genetic research demonstrated the need to take a closer look at the *interaction* between nature and nurture on psychological variables including psychopathological states (e.g., Purcell 2002; Montag and Reuter 2014).

Maybe the most prominent finding from molecular genetics demonstrated that carrying the so-called s-allele of the 5-HTTLPR on the gene coding for the serotonin transporter (called SLC6A4 gene) results in higher probability to suffer from depression but only when adverse environmental effects could be observed in childhood (Caspi et al. 2003; see also meta-analysis by Risch et al. 2009 and Karg et al. 2011). This kind of gene by environment effect speaks for an *inherited sensitivity* of a person. This means that a genetic risk together with an adverse environment will be responsible for the outcome of a certain psychological phenotype. Aside from this Reiss et al. (2013) discussed three more possible forms of gene by environment interactions, which have been studied to a lesser extent so far. These are the concepts of *differential susceptibility*, *goodness of fit*, and *social enhancement*. *Differential susceptibility* describes the concept that some persons are more sensitive reacting toward all kinds of positive and negative social environments. Hence, a person with the aforementioned s-allele of the 5-HTTLPR on the one side would suffer more from an adverse environment; on the other side, this person would also more profit from a positive environment (e.g., Bakermans-Kranenburg et al. 2008; Mitchell et al. 2011). The concept of *goodness of fit* refers to the match between one's own genetic makeup (= genetically arising needs) and the environment. In this setting, a person will only strive if a perfect match between genes and environment can be found. Finally, *social enhancement* summarizes those genes by environment effects where inherited abilities can only prosper when being in a cognitive demanding environment. An example could be the promotion of intellectual gifted children with special learning programs (VanTassel-Baska 2005). In sum, the nature *versus* nurture debate moved in the past century to an understanding of nature *via* nurture to understand the development of human characteristics over time.

The Impact of the Environment on Gene Activity: The Field of Epigenetics

The latest developments in the study of gene by environment effects stem from epigenetic research. Epigenetics describes a rather new discipline investigating the effect of the environment on gene activity (Meaney 2010; Youngson and Whitelaw 2008; Zhang and Meaney 2010). In contrast to classic molecular genetic approaches in the study of individual differences (e.g., Montag et al. 2015; Plieger et al. 2018), researchers in the field of epigenetics do not focus on screening the genome for genetic variants being linked to personality or cognitive abilities. Instead they currently shift their attention on the investigation of methylation patterns to understand how the environment impacts on the gene activity. Although the complete genetic code of a person can be found in the nucleus of each cell of the human body (with the exception of the red blood cells, because they have no nucleus), genetic information is not available in all of these cells. Many of the approximately 25.000 genes located on the human genome are only activated upon request (e.g., to provide information on building insulin when you have eaten something). Methylation patterns can be best studied in promoter regions of genes, hence those regions where a gene is activated. If a promoter gene is strongly methylated (hypermethylated), it is closed and cannot be read. In contrast, when the promoter

of a gene is hypomethylated, the gene can be activated and read. In this context, it has been shown that a growing number of psychological/psychiatric phenotypes can be linked to individual differences in methylation patterns of the epigenome (Haas et al. 2016; see a review by Toyokawa et al. 2012). Taking these recent developments together, the study of the epigenome could be one of the molecular missing links to understand how the environment modulates gene activity.

Conclusions

In sum, the present short chapter showed that the nature-nurture debate has come a long way from the ancient Greek philosophers such as Aristotle to the study of the epigenome in the twenty-first century. With every next step taken in disentangling the effect of nature and nurture on psychological phenotypes, it becomes more and more visible how deeply both genes and environment are entwined over time. Setting nature and nurture aside from each other will not help to understand why we are the kind of creatures we become. This has also been pointed out by Donald Hebb: "Following a public lecture, a journalist approached the renowned psychologist Donald Hebb and asked for his opinion on which factor contributed more to the development of personality, nature or nurture. Hebb responded that to pose this question was akin to asking what contributed more to the area of a rectangle, the length or the width." (Meaney 2001, p. 50).

Cross-References

- ▶ Additive and Nonadditive Genetic Patterns
- ▶ Behavioral Genetics
- ▶ Gene-Gene Interactions
- ▶ Genetic Basis of Traits
- ▶ Molecular Genetics
- ▶ Twin studies

Acknowledgments The position of Christian Montag is funded by a Heisenberg grant awarded to him by the German Research Foundation (DFG, MO2363/3-2).

References

Arslan, R. C., & Penke, L. (2015). Zeroing in on the genetics of intelligence. *Journal of Intelligence, 3*(2), 41–45.

Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Pijlman, F. T., Mesman, J., & Juffer, F. (2008). Experimental evidence for differential susceptibility: Dopamine D4 receptor polymorphism (DRD4 VNTR) moderates intervention effects on toddlers' externalizing behavior in a randomized controlled trial. *Developmental Psychology, 44*(1), 293–300.

Caspi, A., Sugden, K., Moffitt, T. E., Taylor, A., Craig, I. W., Harrington, H., et al. (2003). Influence of life stress on depression: Moderation by a polymorphism in the 5-HTT gene. *Science, 301*(5631), 386–389.

Galton, F. (1876). The history of twins, as a criterion of the relative powers of nature and nurture. *The Journal of the Anthropological Institute of Great Britain and Ireland, 5*, 391–406.

Galton, F. (1869). *Hereditary genius: An inquiry into its laws and consequences*. New York: Macmillan.

Gillham, N. W. (2001). Sir Francis Galton and the birth of eugenics. *Annual review of genetics, 35*(1), 83–101.

Haas, B. W., Filkowski, M. M., Cochran, R. N., Denison, L., Ishak, A., Nishitani, S., & Smith, A. K. (2016). Epigenetic modification of OXT and human sociability. *Proceedings of the National Academy of Sciences, 113*(27), E3816–E3823.

Hahn, E., & Spinath, F. M. (2017). Quantitative behavior genetics of internet addiction. In *Internet addiction* (pp. 125–140). Cham: Springer International Publishing.

Henry, D. (2006). Aristotle on the mechanism of inheritance. *Journal of the History of Biology, 39*(3), 425–455.

Jang, K. L., Livesley, W. J., & Vemon, P. A. (1996). Heritability of the big five personality dimensions and their facets: A twin study. *Journal of Personality, 64*(3), 577–592.

Karg, K., Burmeister, M., Shedden, K., & Sen, S. (2011). The serotonin transporter promoter variant (5-HTTLPR), stress, and depression meta-analysis revisited: Evidence of genetic moderation. *Archives of General Psychiatry, 68*(5), 444–454.

Knopik, V. S., Neiderhiser, J. M., DeFries, J. C., & Plomin, R. (2016). *Behavioral genetics*. New York: Worth.

Langbehn, D. R., Brinkman, R. R., Falush, D., Paulsen, J. S., & Hayden, M. R. (2004). A new model for prediction of the age of onset and penetrance for Huntington's disease based on CAG length. *Clinical Genetics, 65*(4), 267–277.

Meaney, M. J. (2001). Nature, nurture, and the disunity of knowledge. *Annals of the New York Academy of Sciences, 935*(1), 50–61.

Meaney, M. J. (2010). Epigenetics and the biological definition of gene × environment interactions. *Child Development, 81*(1), 41–79.

Mitchell, C., Notterman, D., Brooks-Gunn, J., Hobcraft, J., Garfinkel, I., Jaeger, K., et al. (2011). Role of mother's genes and environment in postpartum depression. *Proceedings of the National Academy of Sciences, 108*(20), 8189–8193.

Montag, C., & Reuter, M. (2014). Disentangling the molecular genetic basis of personality: From monoamines to neuropeptides. *Neuroscience & Biobehavioral Reviews, 43*, 228–239.

Montag, C., Jurkiewicz, M., & Reuter, M. (2012). The role of the catechol-O-methyltransferase (COMT) gene in personality and related psychopathological disorders. *CNS & Neurological Disorders-Drug Targets (Formerly Current Drug Targets-CNS & Neurological Disorders), 11*(3), 236–250.

Montag, C., Hall, J., Plieger, T., Felten, A., Markett, S., Melchers, M., & Reuter, M. (2015). The DRD3 Ser9Gly polymorphism, Machiavellianism, and its link to schizotypal personality. *Journal of Neuroscience, Psychology, & Economics, 8*(1), 48–57.

Montag, C., Hahn, E., Reuter, M., Spinath, F. M., Davis, K., & Panksepp, J. (2016). The role of nature and nurture for individual differences in primary emotional systems: Evidence from a twin study. *PloS One, 11*(3), e0151405.

Plieger, T., Felten, A., Melchers, M., Markett, S., Montag, C., & Reuter, M. (2018). Association between a functional polymorphism on the dopamine-β-hydroxylase gene and reward dependence in two independent samples. *Personality and Individual Differences,121*, 218–222.

Polderman, T. J., Benyamin, B., De Leeuw, C. A., Sullivan, P. F., Van Bochoven, A., Visscher, P. M., & Posthuma, D. (2015). Meta-analysis of the heritability of human traits based on fifty years of twin studies. *Nature Genetics, 47*(7), 702–709.

Purcell, S. (2002). Variance components models for gene–environment interaction in twin analysis. *Twin Research and Human Genetics, 5*(6), 554–571.

Reiss, D., Leve, L. D., & Neiderhiser, J. M. (2013). How genes and the social environment moderate each other. *American Journal of Public Health, 103*(S1), S111–S121.

Riemann, R., Angleitner, A., & Strelau, J. (1997). Genetic and environmental influences on personality: A study of twins reared together using the self-and peer report NEO-FFI scales. *Journal of Personality, 65*(3), 449–475.

Risch, N., Herrell, R., Lehner, T., Liang, K. Y., Eaves, L., Hoh, J., et al. (2009). Interaction between the serotonin transporter gene (5-HTTLPR), stressful life events, and risk of depression: A meta-analysis. *Jama, 301*(23), 2462–2471.

Toyokawa, S., Uddin, M., Koenen, K. C., & Galea, S. (2012). How does the social environment 'get into the mind'? Epigenetics at the intersection of social and psychiatric epidemiology. *Social Science & Medicine, 74*(1), 67–74.

VanTassel-Baska, J. (2005). Gifted programs and services: What are the nonnegotiables? *Theory Into Practice, 44*(2), 90–97.

Youngson, N. A., & Whitelaw, E. (2008). Transgenerational epigenetic effects. *Annual Review of Genomics and Human Genetics, 9*, 233–257.

Zhang, T. Y., & Meaney, M. J. (2010). Epigenetics and the environmental regulation of the genome and its function. *Annual Review of Psychology, 61*, 439–466.

Nature-Nurture Interaction

▶ Goodness of Fit Model

Nave, Christopher

Christopher S. Nave
Behavior and Decision Sciences, University of Pennsylvania, Philadelphia, PA, USA
Rutgers, The State University of New Jersey, Camden, NJ, USA
Department of Psychology, Rutgers University, Camden, NJ, USA

Christopher S. Nave is a faculty member at Rutgers University, Camden. He is a personality psychologist who uses multiple methods and conducts research examining (1) how behavior relates to personality and health, (2) how are people perceived, and (3) what are the psychological properties of situations that people experience.

Early Life and Educational Background

Nave was born on February 2, 1982, in Syracuse, New York. He earned his B.A. in Psychology from Elon University in Elon, North Carolina, in 2004 and his M.A. in General Experimental Psychology from Wake Forest University in Winston-Salem, North Carolina, in 2006. He earned his Ph. D. in Social-Personality Psychology from the University of California, Riverside, in 2011 under the mentorship of David Funder.

Professional Career

Nave has been affiliated with Rutgers University, Camden, since 2011 as an assistant professor in psychology. As a junior scholar, he has authored over 20 publications during his career. Publication outlets include the *European Journal of Personality*, the *Journal of Personality and Social Psychology,* the *Journal of Research in Personality,* and *Social Psychological and Personality Science*. He has served as consulting editor for *Frontiers in Psychology,* the *Journal of Social Psychology*, and the *Journal of Personality and Social Psychology: Personality Processes and Individual Differences*.

Research Interests

Nave's primary research interests are in three areas: (1) behavior and its relationship to personality and health, (2) person perception, and (3) situational assessment. Nave's work emphasizes directly observed behavior and other multi-method approaches to understanding people, including self-report ratings, acquaintance ratings, teacher ratings, and clinician judgments in cross-sectional, repeated measures, and longitudinal formats. A goal in Nave's work is to improve methodological rigor in the field, to incorporate more assessments of behavior, and to begin to think about using behavior to explore potential processes and mechanisms that help explain why personality robustly relates to important life outcomes (e.g., what particular behaviors mediate the relationship between personality and a health outcome?). Nave has explored a number of questions in person perception including how men and women perceive one another; how we perceive individuals with illness; how do gay men, lesbian women, and heterosexual couples perceive their romantic partners; and what are the consequences and creating a model related to how the person perception process works. Finally, Nave has worked in assessing the psychological meaningful elements of situations that people find themselves in.

References

Nave, C. S., & Funder, D. C. (2016). Multi-level analyses, multiple methods and other considerations to enhance research on connections between personality traits and outcomes. *European Journal of Personality, 30*, 317–318. (Invited comment). https://doi.org/10.1002/per.2060.

Nave, C. S., Sherman, R. A., & Funder, D. C. (2008). Beyond self-report in the study of hedonic and eudaimonic well-being: Correlations with acquaintance reports, clinician judgments and directly observed social behavior. *Journal of Research in Personality, 42*, 643–659. https://doi.org/10.1016/j.jrp.2007.09.001.

Nave, C. S., Sherman, R. A., Funder, D. C., Hampson, S. E., & Goldberg, L. R. (2010). On the contextual independence of personality: Teacher's assessments predict directly observed behavior after four decades. *Social Psychological and Personality Science, 1*, 327–334. https://doi.org/10.1177/1948550610370717.

Nave, C.S., Edmonds, G.E., Hampson, S.E., Murzyn, T.*, & Sauerberger, K.S.* (in press). From elementary school to midlife: Childhood personality predicts behavior during cognitive testing over four decades later. *Journal of Research in Personality*. https://doi.org/10.1016/j.jrp.2016.10.00.

Sherman, R. A., Nave, C. S., & Funder, D. C. (2010). Situational similarity and personality predict behavioral consistency. *Journal of Personality and Social Psychology, 99*, 330–343. https://doi.org/10.1037/a0019796.

Near-Death Experiences

Janice Miner Holden
Department of Counseling and Higher Education, College of Education, University of North Texas, Denton, TX, USA

Definition

Near-death experiences (NDEs) are usually vivid and subjectively real experiences of paranormal and/or mystical perceptions that are reported by as many as 20% of people who survive an actual or a threatened close brush with death (Holden 2017; Zingrone and Alvarado 2009). The close brush can range from a fear of imminent death with no actual physical injury to a period of several

minutes of clinical death – no heartbeat or respiration – ending in successful resuscitation. Altered perceptions – NDE features – can be categorized as nonmaterial, a peaceful floating sensation devoid of other phenomena; material, perception of the physical world from a location apart from the physical body; and trans-material, perception of and interaction with environments and/or entities not of the material world, examples of the latter being deceased loved ones and other spiritual beings. Although these feature categories typically occur in the aforementioned order, an NDE can consist of any one or more of the categories in any order and can even be combined, as in the case of an experiencer undergoing surgery and in cardiac arrest who, from a position outside her physical body, saw spiritual entities (trans-material) in the operating room (material) infusing healing light (trans-material) into the surgeons' bodies and, through their fingertips, into her own physical body (material). Whereas most NDEs are dominated by pleasurable emotions such as peace, joy, and love, a minority – perhaps 10% – is dominated by distressing emotions such as terror, horror, or guilt. In addition to experiencers typically being adamant that their experiences were real, several cases have been compiled in which experiencers' perceptions that should have been impossible considering the condition and position of their physical bodies were subsequently verified as completely accurate by one or more credible third parties, most often physicians in attendance during the close brush with death (Rivas et al. 2016).

Researchers investigating personality as it relates to NDEs have focused on two categories. First, they have searched for personality traits that may have preceded an NDE and possibly contributed to its occurrence or the occurrence of certain of its features. Second, they have studied personality changes following an NDE. This research has predominantly taken the form of comparison of experiencers to non-experiencers, especially the approximately 80% of people who survived a closed brush with death but did not report an NDE.

The search for personality traits that may help predict which survivors of a close brush with death will have an NDE, or will have certain NDE features, has been largely fruitless (Holden et al. 2009). A major caveat is that all such research has been retrospective – occurring after the NDE – such that the NDE may have altered recall or expression of the trait. Because experiencers have been found to be demographically indistinguishable from non-experience survivors of close brushes with death, virtually any potentially demographically related personality feature – such as age, sex, or culturally related – may be ruled out. One exception to this generalization is that reported NDE features tend to correspond to experiencers' cultural worldviews; again, however, it is unclear whether this correspondence reflects an actual difference in the experience itself or in the limitations of using one's culturally bound language and mental constructs to describe an experience that is widely acknowledged to be essentially ineffable. Experiencers and non-experiencers have been found indistinguishable regarding mental health. In Locke and Shontz's (1983) comparison of experiencers and non-experiencers following a close brush with death, they found no significant differences in intelligence, extraversion, neuroticism, state anxiety, trait anxiety, and Rorschach indicators of openness to unusual experience. Although some researchers have found experiencers to remember their dreams more often, to be good hypnotic subjects, to be adept at mental imagery, to show more psychological absorption and fantasy proneness, and to report significantly more childhood trauma and associated dissociative tendency than non-experiencers' report, these findings either have not been replicated or have been rendered equivocal by subsequent research (Council and Greyson 1985; Greyson 2014; Irwin 1985; Ring 1992). At most, some of these characteristics may be facilitative, but certainly are not requisite, to the existence or content of an NDE.

Personality changes following NDEs have been extensively researched and are well established (Noyes et al. 2009). Although this research also has been retrospective, validity of results is strengthened by consistency of findings

between studies and by some studies that included corroboration of changes in experiencers by experiencers' intimates. The deeper an NDE – the more features it included and the more intense those features – the more extensive the aftereffects are likely to be. One way to categorize NDE aftereffects is by their predominantly psychological, spiritual, physical, or social character (Holden 2017). Among pleasurable near-death experiencers, perhaps the most pervasive psychological aftereffect is loss of fear of death; experiencers typically look forward to, but do not seek, death. Despite this tendency, some experiencers report a persistent longing for the profound peace and love they experienced in their NDEs. Other psychological changes include greater sense of meaning and purpose in life, greater self-esteem, reduced valuing of material possessions, greater compassion for other beings, increased valuing of service to living beings, an altered cosmological belief system, and greater appreciation for life. Spiritual changes include increased interest in spiritual matters, a tendency to become more spiritual but less religious, a conviction that consciousness survives physical death, and an increase in psychic and related abilities such as precognition and clairvoyance. Physical changes reportedly include altered metabolism, food preferences, need for sleep, allergic sensitivities, and responsiveness to medication; they also include electromagnetic phenomena, both receptive, such as reportedly greater sensitivity to electrical fields, and active, such as electronic devices malfunctioning in the experiencer's physical vicinity (Blalock et al. 2015). Social changes include loss of fear of public speaking, gravitation to different social groups and to more service-oriented careers, and, among experiencers married at the time of their NDEs, greater incidence of divorce – and remarriage to individuals whose beliefs and values more closely align with experiencers' changed cosmological belief systems.

Research on distressing near-death experiencers is limited but indicates that short-term aftereffects may be different – such as an increased rather than decreased fear of death – but eventually are similar to aftereffects of pleasurable NDEs (Bush 2009). Likewise, more limited research on children's NDE aftereffects indicates similarity to adults' NDE aftereffects. Although some aftereffects manifest immediately, others may take years to manifest fully, and the process can be challenging if, for example, the NDE was deep, the experiencer was a child, and/or the experiencer encountered a harmful response to disclosure of the experience in the form of discounting, diagnosing, or demonizing the experience or experiencer (Holden et al. 2014; Stout et al. 2006).

In summary, although researchers have found some personality traits that may facilitate or contribute to the occurrence of NDEs during close brushes with death, they have found none that characterize even a majority of experiencers. Conversely, they have found among experiencers a number of fairly consistent personality changes that appear to be attributable to the NDE and not merely to having survived a close brush with death. Although the specific mechanisms of this change process have not been determined conclusively, experiencers tend to attribute the changes to their immersion, however briefly, into a usually subjectively real or hyperreal alternate state of existence.

Cross-References

- ▶ Absorption
- ▶ Compassion
- ▶ Dissociation
- ▶ Empathy
- ▶ Extraversion
- ▶ Guilt
- ▶ Intelligence
- ▶ Neuroticism
- ▶ Rorschach Inkblot Method, The
- ▶ Self-Esteem
- ▶ Self-Transcendence
- ▶ Spirituality
- ▶ State Anxiety
- ▶ Terror
- ▶ Trait Anxiety
- ▶ Trauma
- ▶ Values

References

Blalock, S., Holden, J. M., & Atwater, P. M. H. (2015). Electromagnetic and other environmental effects following near-death experiences: A primer. *Journal of Near-Death Studies, 33*(4), 181–211. https://doi.org/10.17514/JNDS-2015-33-4-p181-211.

Bush, N. E. (2009). Distressing Western near-death experiences: Finding a way through the abyss. In J. M. Holden, B. Greyson, & D. James (Eds.), *The handbook of near-death experiences: Thirty years of investigation* (pp. 63–86). Santa Barbara: Praeger/ABC-CLIO.

Council, J. R., & Greyson, B. (1985). *Near-death experience and the "fantasy-prone" personality*. Paper presented at the meeting of the American Psychological Association, Los Angeles, CA.

Greyson, B. (2014). Near-death experiences. In E. Cardeña, S. J. Lynn, & S. Krippner (Eds.), *Varieties of anomalous experience: Examining the scientific evidence* (pp. 333–367). Washington, DC: American Psychological Association.

Holden, J. M. (2017). Near-death experiences. In R. D. Foster & J. M. Holden (Eds.), *Connecting soul, spirit, mind, and body: A collection of spiritual and religious perspective and practices in counseling* (pp. 89–97). Alexandria, VA: Association for Spiritual, Ethical, and Religious Values in Counseling.

Holden, J. M., Long, J., & MacLurg, B. J. (2009). Characteristics of Western near-death experiencers. In J. M. Holden, B. Greyson, & D. James (Eds.), *The handbook of near-death experiences: Thirty years of investigation* (pp. 109–133). Santa Barbara, CA: Praeger/ABC-CLIO.

Holden, J. M., Kinsey, L., & Moore, T. R. (2014). Disclosing near-death experiences to professional healthcare providers and non-professionals. *Spirituality in Clinical Practice, 1*(4), 278–287. https://doi.org/10.1037/scp0000039.

Irwin, H. J. (1985). *Flight of mind*. Metuchen, NJ: Scarecrow Press.

Locke, T. P., & Shontz, F. C. (1983). Personality correlates of the near-death experience. *The Journal of the American Society for Psychical Research, 77*, 311–318.

Noyes, R., Fenwick, P., Holden, J. M., & Christian, R. (2009). Aftereffects of pleasurable Western adult near-death experiences. In J. M. Holden, B. Greyson, & D. James (Eds.), *The handbook of near-death experiences: Thirty years of investigation* (pp. 41–62). Santa Barbara, CA: Praeger/ABC-CLIO.

Ring, K. (1992). *The omega project*. New York, NY: Morrow.

Rivas, T., Dirven, A., Smit, R. H. (2016). In J. M. Holden (Ed.), *The self does not die: Verified paranormal phenomena from near-death experiences* (trans: Boenke, W.). Durham, NC: International Association for Near-Death Studies.

Stout, Y. A., Jacquin, L. A., Atwater, P. M. H. (2006). Six major challenges faced by near-death experiencers. *Journal of Near-Death Studies, 25*(1), 49–62. https://doi.org/10.17514/JNDS-2006-25-1-p49-62.

Zingrone, N. L., & Alvarado, C. S. (2009). Pleasurable Western adult near-death experiences: Features, circumstances, and incidence. In J. M. Holden, B. Greyson, & D. James (Eds.), *The handbook of near-death experiences: Thirty years of investigation* (pp. 17–40). Santa Barbara, CA: Praeger/ABC-CLIO.

Necka, Edward

Edward Necka
Institute of Psychology, Jagiellonian University, Krakow, Poland

Edward Nęcka is a faculty member at Jagiellonian University in Kraków, Poland. He also teaches at the University of Social Sciences and Humanities in Warsaw. He is a full member of the Polish Academy of Sciences, at present serving as the vice-president of the Academy. He is a cognitive psychologist who tries to apply the experimental cognitive approach to the study of individual differences. His main fields of interests are creativity, intelligence, and self-control.

Early Life and Educational Background

Edward Nęcka was born in 1953. He graduated from the Jagiellonian University, Kraków, Poland, in 1977. He earned his PhD degree in 1981 on the basis of the dissertation entitled "Efficacy of selected creativity training techniques." In 1988 he obtained tenure position after receiving a "habilitation" degree. He has authored or coauthored more than 100 research papers in the field of individual differences and cognitive psychology. He is also an author of seven books about creativity and intelligence. Together with Jarosław Orzechowski and Błażej Szymura, he published a handbook entitled *Cognitive psychology* (Warsaw, 2006).

Professional Career

Edward Nęcka spent two semesters at Yale University as a post-doc fellow, collaborating with

Robert J. Sternberg. He also cooperated with colleague from RuhrUniversität Bochum, Germany, and University of Braga, Portugal. He is now a member of the Association for Psychological Science. Formerly he was active as a member of the International Society for the Study of Individual Differences (ISSID), the European Society for Cognitive Psychology (ESCoP), and the European Association of Personality psychology (EAPP). He was a chair of the ESCoP scientific meeting in Kraków in 2009. He also helped to organize the EAPP conference in Kraków in 2000.

Research Interests

Edward Nęcka's research interests evolved from creativity studies to intelligence research and investigations of self-control. He belies that creativity, intelligence, and self-control are basic determinants of human achievements and performance, both in academic settings and in the workplace. Being relatively independent one of another, these three dimensions of individual differences allow better prediction of one's life career than any of them separately. In his research, Nęcka consistently attempts to describe cognitive underpinnings of these individual traits. He believes that one's creativity, intelligence, or self-control are determined by basic cognitive processes and skills. Particularly, he is interested in working memory and cognitive control as possible factors apt to account for individual differences in creativity, intelligence, and self-control. He is also interested in cognitive training as a means to boost and develop these traits.

Selected Bibliography

Chuderski, A., & Nęcka, E. (2012). The contribution of working memory to fluid reasoning: Capacity, control, or both? *Journal of Experimental Psychology: Learning, Memory, and Cognition, 38*(*6*), 1689–1710.

Chuderski, A., Taraday, M., Nęcka, E., & Smoleń, T. (2012). Storage capacity explains fluid intelligence but executive control does not. *Intelligence, 40*(*3*), 278–295.

Gruszka, A., & Nęcka, E. (2002). Priming and acceptance of close and remote associations by creative and less creative people. *Creativity Research Journal, 14*, 193–205.

Nęcka, E. (1998). Learning, automaticity, and attention: An individual differences approach. In W. P. L. Ackerman, P. C. Kyllonen, & R. D. Roberts (Eds.), *Learning and individual differences: Process, trait, and content determinants* (pp. 161–181). Washington, DC: American Psychological Association.

Nęcka, E. Cognitive analysis of intelligence: The significance of working memory processes. *Personality and Individual Differences, 13*, 1031–1046.

Nęcka, E. *Creativity training: A guidebook for psychologists, educators, and teachers*. Kraków: TAiWPN Universitas.

Nęcka, E. Attention, working memory, and arousal: Concepts apt to account for the "process of intelligence". In G. Matthews (Ed.), *Cognitive science perspectives on personality and emotion* (pp. 503–554). Amsterdam: Elsevier Science.

Nęcka, E., Grohman, M., & Słabosz, A. (2006). Creativity studies in Poland. In J. Kaufman & R. J. Sternberg (Eds.), *International handbook of creativity* (pp. 270–306). Cambridge, UK: Cambridge University Press.

Nęcka, E., Żak, P., & Gruszka, A. (2016). Insightful imagery is related to working memory updating. *Frontiers in Psychology, 7*, 137. https://doi.org/10.3389/fpsyg.2016.00137.

Need

▶ Dynamic Trait
▶ Fairness

Need for Achievement

Maria Finogenow
Institute of Psychology, University of Lodz, Lodz, Poland

Synonyms

Achievement motivation

Definition

Need for achievement is the desire to obtain excellent results by setting high standards and striving

to accomplish them. It is a consistent concern with doing things better.

Introduction

Scientists' interest in the issues of motivation to achieve successes was developed in the first half of the twentieth century, when Henry Murray (1938, p. 164) defined the need for achievement as a desire to "accomplish something difficult;. . . to overcome obstacles and attain a high standard; to excel oneself; to rival and surpass others."

A significant contribution to the development of studies on the need for achievement was made by David McClelland, who, together with his co-workers, adapted the Thematic Apperception Test to examine motivation to achieve successes (McClelland et al. 1953). He defined the need for achievement as a general and relatively stable personality disposition that is learned on the basis of affective experiences. He claimed that all people define their goals and pursue them because they feel the need for achievement.

Theoretical Background

Need for achievement was identified by Murray (1938) as one of the basic human needs. In his conception, need for achievement, like other needs, was treated as a part of a person's personality, which can trigger behavior across different situations.

Murray's concept of need for achievement was systematically developed by McClelland and his colleagues. McClelland identified three types of motivational need, which he described in his 1961 book, *The Achieving Society*: a need for achievement, a need for affiliation, and a need for power/authority. McClelland said that most people, regardless of culture, gender, or age, possess and exhibit a combination of these motivational characteristics, and one of these is the person's dominant motivating driver. He also argued that these needs are socially acquired or learned, which is why this theory is sometimes called the Acquired Needs Theory or the Learned Needs Theory.

McClelland argued that the basis for the need for achievement lies in the affective gratification which is associated with mastering difficult tasks or improving one's performance. According to McClelland (1988), children have an inborn ability to feel satisfaction as a result of the growth of their own skills. Due to the skills, they achieve a greater and greater influence upon the surrounding reality. Therefore, it is possible to strengthen the inborn motivation to improvement by means of systematic creation of situations in which a child experiences this type of satisfaction. While facing a child with a challenge, in organizing a situation in which improvement is possible, one may evoke anticipation of this state (that is pleasant and attractive), which leads to activity aimed at achieving a positive result. McClelland also believed that needs could be developed in grown-up individuals. Therefore, he developed several training programs for managers to increase their need for achievement.

The assumptions formed by McClelland were developed by his co-worker John Atkinson (Atkinson and Feather 1966). He proposed that the tendency to engage in an achievement task is the sum of two opposed tendencies: *a tendency to achieve success* (*hope for success*) and *a tendency to avoid failure* (*fear of failure*). Although both the tendencies are present in everybody, one of them is usually predominant. People with strong achievement motive are *approach-motivated* individuals, and those in whom the motive to avoid failure is stronger are *avoidance-motivated* individuals.

These tendencies develop on the basis of emotional experiences of an individual. The approach-oriented tendencies develop when behaviors that have been undertaken in order to achieve a goal become associated with some pleasant consequences and positive affect. Whereas avoidance-oriented tendencies develop when avoiding behaviors lead to reduction of displeasure or a negative affect (Atkinson and Feather 1966; McClelland et al. 1953). The pattern of need for achievement one possesses influences the person's emotional reactions to standards of excellence. Hope for success is related to positive emotions like hope, pride, and anticipatory

gratification. Fear of failure is associated with negative emotions such as anxiety, defense, and fear that a particular achievement situation is too difficult. Dominance of one of the two motives influences also one's preferences to specific tasks. Approach-motivated individuals prefer intermediate risk while avoidance-motivated individuals avoid intermediate risk, preferring instead either very easy or very difficult undertakings (Atkinson and Feather 1966).

In contemporary theories of achievement motivation, behaviors related to achievements are explained in categories of *achievement goals* rather than needs. This alternative approach was offered by Carol Dweck (1986), who proposed dichotomous achievement goal framework that comprises performance goals and mastery goals. Performance goals are focused on demonstrations of competence relative to others, while mastery goals are focused on the development of competence and task mastery. Accordingly, performance goals have largely negative and mastery goals primarily positive influence on achievement-related behaviors. This conceptualization of achievement goals is systematically extended by Andrew Elliot and his colleagues (e.g., Elliot et al. 2011).

Correlates of the Need for Achievement

Numerous studies have linked achievement motivation with other characteristics and domain-relevant outcomes, such as academic performance (e.g., Hustinx et al. 2009), entrepreneurial success (e.g., Collins et al. 2004), and economic growth (Beugelsdijk and Smeets 2008).

Research has also demonstrated that individuals with a high level of the need for achievement have certain characteristics which enable them to work best in certain situations. They like situations in which they take personal responsibility for finding solutions to the problems. They have a tendency to work hard, seek challenges, and outperform others across situations (Atkinson and Feather 1966; McClelland et al. 1953; Murray 1938). They constantly seek improvements and ways of doing things better. Achievement-motivated individuals perceive challenging tasks as an opportunity to experience the positive affect associated with proficiency and mastery (Schultheiss and Brunstein 2005). They prefer moderate achievement goals, realistic but challenging tasks and perform better at these tasks (Ramsay and Pang 2013). Moreover, individuals high in the need for achievement are interested in regular, concrete feedback on their progress and achievement (McClelland et al. 1953; Ramsay and Pang 2013). They seek feedback that is reliable, quantifiable, and factual because it allows them to improve on their performances (Brunstein and Maier 2005). The achievement drive is also differentiated from a generalized drive for success. Accordingly, achievement-motivated individuals are interested in *efficiency*, in getting the same result for less effort, in finding shortcuts. Those who like to work long and hard are instead high in two other motivational characteristics – the desire for controlling action and the need for power.

Measuring the Need for Achievement

Measurement of the need for achievement is based upon the assumption that there exist two separate though interrelated motivational systems: *implicit motives and explicit motives* (McClelland et al. 1989). *Implicit motives* are relatively constant and unconscious needs that are linked to preferring definite types of stimuli as pleasant or unpleasant ones. They develop as early as in early childhood by means of affective experiences. Although implicit needs exert an influence upon one's behavior, an individual is not aware of the impact and cannot describe them freely. That is why they are measured indirectly with the use of projective methods. Measurement of the implicit need for achievement (often denoted as *n* Ach or *n* Achievement) is most often made with *the Picture Story Exercise* (PSE; McClelland et al. 1953), which was constructed on the basis of Murray's *Thematic Apperception Test* (TAT). The tool comprises a set of ambiguous pictures that present – among others – some social situations, and participants

are asked to interpret them. Every statement of the examinees is assessed according to the elaborated system of the need for achievement indicators.

In contrast, the *explicit system* contains conscious and verbalized beliefs about one's own goals and preferences, cognitive representations of what a person wants to achieve at present. As *explicit goals* are accessible to consciousness, they are measured with self-report methods such as questionnaires, for example: *Personality Research Form* (Jackson 1974) or *Work and Family Orientation Scale* (Spence and Helmreich 1983). Contrary to *n* Ach, the self-attributed need for achievement is often denoted as *san* Achievement (McClelland et al. 1989).

Correlations between implicit and explicit measures of the need for achievement are nonsignificant or weaker than expected (Köllner and Schultheiss 2014; McClelland et al. 1989). Also their determinants and behavioral consequences are different. Implicit motives are better predictors of spontaneous long-lasting behavioral tendencies, whereas explicit motives render it possible to predict short-term immediate choices and behaviors to a greater extent (e.g., McClelland et al. 1989). Moreover, implicit motives are related to a general orientation toward varied types of tasks, while explicit motives are often determined by social norms that allow for defining areas in which the goals may be realized. Due to that *n* Ach is linked to a general tendency to improve oneself and to do tasks well, and explicit desires for achievement are related to an attempt at achieving positive results in a given area, for example, at school or at work. A number of studies have also demonstrated that the degree of congruence between implicit motives and explicit goals is moderated by certain personality traits and is associated with self-determination and well-being (e.g. Schultheiss et al. 2008).

Conclusion

Since the early part of the twentieth century, the need for achievement has been the focus of the vast majority of personality research on social motives. It investigated both antecedents and consequences of the need for achievement. Achievement motivation can be approach-oriented (hope for success) or avoidance-oriented (fear of failure). Moreover, there exist two separate motivational systems: the implicit need for achievement measured indirectly via projective methods is unrelated or inconsistently related to explicit motives measured with self-report methods.

Cross-References

- ▶ Achievement Goals
- ▶ Achievement Motives
- ▶ Approach-Avoidance Conflict
- ▶ Goals
- ▶ Mastery Goals
- ▶ McClelland, David C.
- ▶ Need for Affiliation
- ▶ Need for Power
- ▶ Needs
- ▶ Projective Tests
- ▶ Thematic Apperception Test

References

Atkinson, J. W., & Feather, N. T. (Eds.). (1966). *A theory of achievement motivation*. New York: Wiley.

Beugelsdijk, S., & Smeets, R. (2008). Entrepreneurial culture and economic growth: Revisiting McClelland's thesis. *American Journal of Economics and Sociology, 67*, 915–939.

Brunstein, J. C., & Maier, G. W. (2005). Implicit and self-attributed motives to achieve: Two separate but interacting needs. *Journal of Personality and Social Psychology, 89*, 205–222.

Collins, C. J., Hanges, P. J., & Locke, E. A. (2004). The relationship of achievement motivation to entrepreneurial behavior: A meta-analysis. *Human Performance, 17*(1), 95–117.

Dweck, C. S. (1986). Motivational processess affecting learning. *American Psychologist, 41*, 1040–1048.

Elliot, A. J., Murayama, K., & Pekrun, R. (2011). A 3 x 2 achievement goal model. *Journal of Educational Psychology, 103*, 632–648.

Hustinx, P. W. J., Kuyper, H., & Dijkstra, P. (2009). Achievement motivation revisited: New longitudinal data to demonstrate its predictive power. *Educational Psychology, 29*(5), 561–582.

Jackson, D. N. (1974). *Manual for the personality research form*. Goshen: Research Psychology Press.

Köllner, M., & Schultheiss, O. C. (2014). Meta-analytic evidence of low convergence between implicit and explicit measures of the needs for achievement, affiliation, and power. *Frontiers in Psychology, 5*, 826.
McClelland, D. C. (1988). *Human motivation*. New York: Cambridge University Press.
McClelland, D. C., Atkinson, J. W., Clark, R. A., & Lowell, E. L. (1953). *The achievement motive*. New York: Appleton-Century-Crofts.
McClelland, D. C., Koestner, R., & Weinberger, J. (1989). How do self-attributed and implicit motives differ? *Psychological Review, 96*, 690–702.
Murray, H. A. (1938). *Explorations in personality*. New York: Oxford University Press.
Ramsay, J. E., & Pang, J. S. (2013). Set ambiguity: A key determinant of reliability and validity in the picture story exercise. *Motivation and Emotion, 37*(4), 661–674.
Schultheiss, O. C., Jones, N. M., Davis, A. Q., & Kley, C. (2008). The role of implicit motivation in hot and cold goal pursuit: Effects on goal progress, goal rumination, and depressive symptoms. *Journal of Research in Personality, 42*, 971–987.
Schultheiss, O. C., & Brunstein, J. C. (2005). An implicit motive perspective on competence. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 31–51). New York, NY: Guilford Press.
Spence, J. T., & Helmreich, R. L. (1983). Achievement-related motives and behaviors. In J. T. Spence (Ed.), *Achievement and achievement motives: Psychological and sociological approaches* (pp. 7–74). San Francisco: W.H. Freeman.

Need for Affiliation

Anna Józefczyk
Institute of Psychology, University of Lodz, Lodz, Poland

Synonyms

Affiliation motive; Need for belonging

Definition

The need for affiliation is a term which concerns establishing, maintaining, and restoring positive relationships with other people (Atkinson et al. 1954). People with a high need for affiliation are sociable, friendly, interested in social interactions, and they prefer being in other people's company rather than on their own.

Introduction

The term was first introduced by Henry Murray, in 1938 in his book *Explorations in Personality,* and popularized by David McClelland who considered the need for affiliation to be an individual's main motivational disposition, together with the need for achievement and the need for power. It was also included among the basic needs in Maslow's theory and defined as a need for belonging and love, triggered after satisfying physiological and safety needs.

The need for affiliation motivates an individual to seek contact with others. Satisfying this need entails gaining some benefits – receiving a reward or avoiding a punishment. Apart from individual differences in the level of the need for affiliation, situational variability may be observed. The need for affiliation has adaptive significance and influences subjective well-being.

Components

The need for affiliation is not a uniform construct and it can be motivated by two main tendencies: hope of intimacy and fear of rejection (Schultheiss 2008). People with a high need for affiliation derive pleasure and satisfaction from contact with others. Therefore, tending towards this contact is associated with hope for positive emotions and gaining thus positive reinforcement. The search for affiliation may also be accompanied by fear that an individual will not be considered attractive enough and will be rejected. In this case, the need for affiliation is motivated by the desire to diminish the discomfort related to the potential isolation and solitude, so the search for relationships occurs on the basis of negative reinforcement. These two components are independent from one another. Thus, an individual, while satisfying the need for affiliation, may experience high levels of both hope of intimacy and fear of rejection.

The Formation of the Need for Affiliation

A significant factor in the formation process of the need for affiliation is the behavioral patterns of

parents toward children in early childhood. A longitudinal study of McClelland and Pilon (1983) showed that a higher need for affiliation in adulthood is related to a more frequent use of praise in the upbringing process and lower availability of the mother to a crying baby. Therefore, if an individual's instrumental behavior related to the search for contact with others is rewarded, for example, through gaining appreciation or interest of one's family, the likelihood of the search for affiliation in the future is increased. A higher need for affiliation may also be associated with punishment received in the past for the lack of initiative in contact with others. Furthermore, studies indicate that previous experience of the negative consequences of intimacy with others may result in low need for affiliation, which manifests itself in fear of intimacy and avoidance of involvement in relationships (Schultheiss 2008).

Differences in the desire to contact others may also have their source in cultural factors. The need for affiliation has been found to be higher in collectivistic than in individualistic cultures (Triandis 2001). Additionally, people from individualistic cultures have a tendency to establish numerous yet superficial relationships, whereas in collectivistic cultures the number of established relationships is smaller but their quality – in terms of their depth and stability – is higher.

Situational Variability

The need for affiliation is a dynamic feature, inasmuch as apart from interindividual differences in its levels, there are also intraindividual ones. It means that an individual's level of the need for affiliation may be subject to certain fluctuation as a result of situational factors. Privacy regulation theory (Altman 1977) assumes that individual's need for privacy (vs. affiliation) may vary from openness to withdrawal within a few hours. It is due to the fact that people operate according to optimization principle which assumes that they try to adjust their current level of social interactions to the desired level. If they do not have enough contact, they feel lonely, while too much of it may make them feel overwhelmed. Individual's feeling of isolation or overwhelming is thus of a subjective and relative nature. It is not stable but it changes according to the desired level of contact at a given moment. An alternative model explaining the situational variability in the need for affiliation is the model of social affiliation (O'Connor and Rosenblood 1996). The authors assume that people operate according to the principle of homeostasis, maintaining a stable level of relationships, as close to the desired level as possible. Variations from this optimum, occurring as a result of experiencing various situations, motivate an individual to seek different levels of social contact, so that this optimal level may be restored. If an individual experiences an overload of social stimulation, the restoration of the optimum will involve seeking solitude. Analogically, experiencing too much solitude and isolation will motivate an individual to establish contact with others.

Behavioral Correlates

Individuals with a high need for affiliation come into interaction with people perceived as friendly or similar to them and those who express similar opinions. The experiment of Schultheiss and Hale (2007) showed that such people focus their attention on those social stimuli which may indicate affiliation or rejection – happy or smiling faces, as well as angry and hostile ones. High-affiliation individuals smile, laugh, and use the pronoun "we" in contact with others more frequently (McAdams et al. 1984).

Adaptive Significance

The need for affiliation is described as one of the key predictors of subjective well-being of an individual. Gable (2006) proved that hope of affiliation is associated with a lesser feeling of solitude and a more positive attitude towards social relations, whereas fear of rejection coexists with a higher feeling of solitude, lesser satisfaction, and higher anxiety over social relations, as well as a lower level of emotional well-being. The need for affiliation is significant also in the process of dealing with stress. It is connected with social

support perceived by an individual, which is an important factor helping an individual in the process of adaptation to stressful events. A high level of fear of rejection, associated with the tendency to doubt whether one is liked, attractive, and "taken care of" by others, diminishes the availability of this factor and thus the effectiveness of dealing with stressful stimuli. In case of lack of stressors, high-affiliation people are less likely to become ill than others (McClelland 1989).

Measurement

It is assumed that the need for affiliation, as one of motivational features, is not available to an individual's consciousness and thus should not be measured with methods based on self-description (Schultheiss 2008). It shapes behavior indirectly, giving emotional meaning to external stimulation, but it does not initiate a declarative process available to conscious processing. People usually remain unconscious of the fact that their behavior is motivated by the need for affiliation and so they are unable to accurately determine its level. For this reason, the measure of the need for affiliation is partly conducted through projective tests, the most common of which is the Thematic Apperception Test (TAT) by Murray. In this method, the task of the person tested is to tell a story on the basis of a series of pictures. Each of them contains ambiguous clues, thanks to which the person tested interprets the observed situations on his/her own and, as the author assumed, expresses subconscious needs, such as the need for affiliation. The TAT had many modifications, for example, the Picture Story Exercise (PSE) by McClelland, Koestner, and Weinberger or the Multi-Motive Grid (MMG) by Sokolowski, Schmalt, Langens, and Puca.

Conclusion

The need for affiliation may be motivated by a desire to experience intimacy and a desire to avoid solitude. Special attention should be paid to people in whom the second tendency is particularly high when the fear of rejection and solitude determines social behavior. Despite the behavioral similarities between people with high hope of intimacy and people with high fear of rejection, the level of physical and emotional well-being substantially distinguishes them. Being aware of the developmental precursors of these two tendencies provides the chance for the most beneficial way of forming the need of affiliation.

Cross-References

- ▶ Collectivism
- ▶ Individualism
- ▶ Instrumental Conditioning
- ▶ Projective Tests
- ▶ Social Support

References

Altman, I. (1977). Privacy regulation: Culturally universal or culturally specific? *Journal of Social Issues, 33*(3), 66–84.

Atkinson, J. W., Heyns, R. W., & Veroff, J. (1954). The effect of experimental arousal of the affiliation motive on thematic apperception. *The Journal of Abnormal and Social Psychology, 49*(3), 405–410.

Gable, S. L. (2006). Approach and avoidance social motives and goals. *Journal of Personality, 74*(1), 175–222.

McAdams, D. P., Jackson, J., & Kirshnit, C. (1984). Looking, laughing and smiling in dyads as a function of intimacy motivation and reciprocity. *Journal of Personality, 52*, 261–273.

McClelland, D. C. (1989). Motivational factors in health and disease. *American Psychologist, 44*, 675–683.

McClelland, D. C., & Pilon, D. A. (1983). Sources of adult motives in patterns of parent behavior in early childhood. *Journal of Personality and Social Psychology, 44*, 564–574.

O'Connor, S., & Rosenblood, L. (1996). Affiliation motivation in everyday expierience: A theoretical perspective. *Journal of Personality and Social Psychology, 70*, 513–522.

Schultheiss, O. C. (2008). Implicit motives. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality. Theory and research* (pp. 603–633). New York: The Guilford Press.

Schultheiss, O. C., & Hale, J. A. (2007). Implicit motives modulate attentional orienting to perceived facial expressions of emotion. *Motivation and Emotion, 31*(1), 13–24.

Triandis, H. C. (2001). Individualism-collectivism and personality. *Journal of Personality, 69*, 907–924.

Need for Anonymity

► Need for Privacy

Need for Autonomy, The

Lisa Legault
Clarkson University, Potsdam, NY, USA

Synonyms

Agency; Freedom; Perceived choice; Personal causation; Volition

Definition

Autonomy is a critical psychological need. It denotes the experience of volition and self-direction in thought, feeling, and action. It refers to the perception of being self-governed rather than controlled by external forces.

Introduction

Human beings want to make their own decisions, pursue their own goals, and come up with their own ideas. In other words, they want to feel autonomous. According to self-determination theory (SDT; Ryan and Deci 2000), which is a broad theory of human motivation and personality, autonomy is one of the three basic psychological needs (along with *competence* and *relatedness*) which are necessary for optimal growth and well-being. When people feel autonomous, they perceive their needs, motivations, preferences, and behaviors to be aligned and congruent with one another. In other words, they feel like the directors of their own lives and live according to their own interests and values. When autonomous, people endorse their own feelings and actions at the *highest order of reflection* (Ryan and Deci 2004). This desire to feel self-directed and self-endorsed is innate. All individuals will naturally strive to have this need fulfilled, as long as their environment facilitates and supports this striving. This implies that the individual is continually involved in an interaction with his or her environment, and while the need for autonomy is present in all individuals regardless of background or culture (Chen et al. 2015; Chirkov et al. 2010), it requires nutrients from the environment in order to flourish.

Autonomy Is Both a Personal Trait and a Motivational State

People may strive toward feeling self-directed and self-determined in their lives, that is, they may embody an overall disposition toward feeling autonomous that is relatively enduring – such that they generally experience a sense of personal endorsement of their goals and actions. This reflects autonomy as a personal *trait* or *disposition*. However, autonomy is also *motivational* in nature; it pertains to the specific domain or task at hand. Thus, while an individual may feel an overall sense of volition and self-concordance in his or her life (trait), feelings of autonomy in specific domains (e.g., work, school, sports, relationships) or in the context of specific activities (cooking dinner, drawing a picture) might vary from high to low. So, the same person might feel highly autonomous with family when, say, making decisions and plans regarding what to eat for dinner or where to go on vacation, but feel low in autonomy at work when being required to complete unenjoyable or menial tasks that are mandated by one's employer. This means that, although autonomy can be somewhat stable at the personality level, it can also vary from situation to situation and moment to moment. In other words, the extent to which an individual feels autonomous on any given day, or at any given moment, depends largely on the characteristics of the situation, the features of the task at hand, and the quality of the interpersonal interaction.

The experience of autonomy is subjective. It depends upon the moment-to-moment perception of three interrelated components – an internal

perceived locus of causality, a sense of volition, and perceived choice (Reeve 2014). When an individual's *perceived locus of causality* (PLOC) is internal, she feels like the primary cause or source of her motivated action. That is, her behavior stems from her own personal beliefs or desires. For instance, she might choose to go to see a movie with her friend because she very much wants to see that particular movie and looks forward to spending quality time with that particular friend. Thus, the source of the motivation is internal and personal. In contrast, when the perceived locus of causality is external, the individual is likely to perceive his behavior as governed by environmental sources that are outside himself (e.g., another person or a controlling situation). For instance, he might join a friend for a movie because his friend pressured him into it, or because he feels obligated due to the commitment he originally made.

Volition refers to feelings of freedom and willingness to engage in activity or experience. The idea of volition is concerned with "wanting to" do something, as opposed to "having to" do it. Volition is marked by an absence of coercion.

Finally, *perceived choice* reflects the experience of flexibility and opportunity in making decisions. True choice occurs when the individual is able to reflectively decide to pursue one task or path over other courses of action, as opposed to feeling pressured into a certain way of thinking or acting, or having to "choose" between undesired alternatives.

Satisfying the Need for Autonomy

Evidence from research labs around the world suggest that when the need for autonomy is satisfied, people feel more interested, engaged, and happy (Niemiec and Ryan 2013). In contrast, when the need for autonomy is neglected or actively frustrated, people feel more alienated, helpless, and sometimes even hostile or destructive (Moller and Deci 2010). Because people cannot be separated from the environment in which they inhabit, the well-being of any individual depends largely on the extent to which the environment can provide opportunities to satisfy the need for autonomy. But how, exactly, is the basic need for autonomy satisfied? *Autonomy-supportive contexts* facilitate the development and satiation of the need for autonomy by offering choice and opportunity for self-direction. They nurture inner motivational resources, offer explanations and rationales, and use informational language rather than directives or commands. Autonomy-supportive people work to align activities with the other person's interests and preferences. Autonomy-supportive teachers, for instance, may help boost a learner's autonomy by offering him or her academic choices and options, or by conveying the personal relevance and utility of a task or assignment so that the learner can internalize the meaningfulness of the activity.

Conclusion

Autonomy is the basic need to be self-directed and to feel self-determined. Similarly, autonomous motivation refers to the perception of volition, choice, and personal causation in an activity – as opposed to feeling pressured, constrained, restrained, or coerced. People feel autonomous when they do the things they enjoy or find important and valuable. For these reasons, *motivational autonomy* is critically related to interest and engagement with the task at hand. Similarly, *dispositional autonomy* is related to psychological well-being – presumably because those high in dispositional autonomy tend to be self-congruent in their feelings, thoughts, and actions; that is, they select goals, activities, and courses of action that are consistent with their fundamental needs and preferences. This process facilitates growth and self-integration (i.e., self-concordance or self-coherence), and instead of perceiving their self-worth as contingent upon social approval and meeting expectations, autonomously functioning individuals feel free to express who they really are.

Cross-References

- ▶ Intrinsic and Extrinsic Motivation
- ▶ Need for Competence, The
- ▶ Self-Determination Theory

References

Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., Van der Kaap-Deeder, J., … & Ryan, R. M. (2015). Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motivation and Emotion, 39*(2), 216–236.

Chirkov, V. I., Ryan, R. M., & Sheldon, K. M. (Eds.). (2010). *Human autonomy in cross-cultural context: Perspectives on the psychology of agency, freedom, and well-being* (Vol. 1). New York: Springer.

Moller, A. C., & Deci, E. L. (2010). Interpersonal control, dehumanization, and violence: A self-determination theory perspective. *Group Processes & Intergroup Relations, 13*, 41–53.

Niemiec, C. P., & Ryan, R. M. (2013). What makes for a life well lived? Autonomy and its relation to full functioning and organismic wellness. In *The Oxford handbook of happiness* (pp. 214–226). Oxford: Oxford University Press.

Reeve, J. (2014). *Understanding motivation and emotion*. Hoboken: Wiley.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68–78.

Ryan, R. M., & Deci, E. (2004). Autonomy is no illusion: Self-determination theory and the empirical study of authenticity, awareness, and will. In J. Greenberg, S. L. Koole, & T. Pyszczynski (Eds.), *Handbook of experimental existential psychology*. New York: The Guilford Press.

Need for Belonging

▶ Need for Affiliation

Need for Closure

▶ Entry for Need for Closure

Need for Closure Scale

Arne Roets and Alain Van Hiel
Department of Developmental, Personality, and Social Psychology, Ghent University, Ghent, Belgium

Synonyms

NFC; NFCC

Definition

The Need for Closure (NFC) – defined as an individual's desire for "*an* answer on a given topic, *any* answer . . . compared to confusion and ambiguity" (Kruglanski 1990, p. 337; see also Kruglanski and Webster 1996) – varies along a continuum with a strong need to attain closure at one end and a high need to avoid closure at the other end. Although NFC may be temporarily increased by situations (e.g., noise or time pressure), people also substantially differ in their chronic level of "dispositional closure."

The Original Need for Closure Scale

To measure stable individual differences in NFC, Kruglanski developed the 42-item NFC scale (Kruglanski et al. 1993; Webster and Kruglanski 1994). The scale includes five facet scales representing various ways in which NFC expresses itself. Individuals high in dispositional NFC *prefer order* and structure while abhorring chaos and disorder in their lives. They also *prefer predictability*, desiring knowledge that is stable and reliable across circumstances. High NFC individuals further also feel compelled to reach quick decisions, reflected in their need for *decisiveness.* Moreover, they feel *discomfort with ambiguity*, experiencing unclear situations or stimuli as aversive. Finally, they are *closed-minded*, often showing clear resistance to have their knowledge challenged by inconsistent evidence or alternative opinions.

The NFC items are rated on 6-point Likert scales ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Representative items include: "I like to have a place for everything and everything in its place," "I don't like to go into a situation without knowing what I can expect," and "I dislike it when a person's statement could mean many different things." After item score reversals for about one third of the items, higher ratings reflect higher NFC scores.

The Revised Version of the Need for Closure Scale

Although intended and developed as a one-dimensional scale with five facets, psychometric

analyses by Neuberg, Judice, and West (1997) of the NFC item set revealed a deviating pattern of inter-item and item-scale correlations for the Decisiveness facet, as such indicating a two-dimensional structure. After years of debate about the dimensionality and meaning of the NFC scale, a series of studies by Roets and Van Hiel (2007) demonstrated that the original Decisiveness items tap into the ability to achieve cognitive closure rather than into the motivation or need to achieve closure. To resolve this problem, Roets and Van Hiel provided six alternative Decisiveness items measuring the intended "need for decisiveness" to replace the seven original items which were found to probe into ability rather than into the envisaged need. Subsequent analyses showed that this revised, 41-item NFC scale constitutes a one-dimensional scale that exclusively measures need – as intended by its original developers – and shows good psychometric properties (see, Roets and Van Hiel 2007).

The Brief Version of the Revised NFC Scale

In response to the frequent use in literature of abridged, "idiosyncratic" versions of the NFC scale that included only a selection of the items for space-saving reasons but without proper validation, Roets and Van Hiel (2011a) developed and validated a 15-item version of the revised NFC scale. The explicit aim of this more standardized and validated item set was to provide researchers with a reduced version of the one-dimensional NFC scale that had high internal consistency as well as a minimal loss of the content richness and the predictive power of the full scale. To this end, Roets and Van Hiel analyzed the single-dimension factor loadings of the 41 items of the revised NFC scale in a large, heterogeneous sample and selected the three items with the highest loadings for each facet scale. Hence, the 15-item version includes the items that best tap into the general NFC construct but also ensures a fair representation of all NFC facets.

Further analyses showed that the psychometric properties of the abridged NFC scale were similar to those of the revised full NFC scale and virtually identical relationships were found between both versions of the scale and relevant variables that had already been associated with NFC in the literature. An additional validation study by Crowson (2013) provided further, independent evidence for the 15-item scale as a reliable, one-dimensional, stand-alone measure of the need for closure.

Scale use

The scale has mainly been used in psychological research but also in applied fields such as political psychology, consumer behavior, and medical decision-making. If the study design permits, including the lengthier, full NFC scale is recommended, especially if NFC is the core variable of interest, since the full scale also allows for separate analyses with each of the individual facet scores in addition to the overall score. If space or time is limited, the brief 15-item version is a valid alternative measure of overall individual differences in NFC on a one-dimensional scale. The abridged scale is, however, not suitable for the assessment of the individual NFC facets (see Roets and Van Hiel 2011a).

Related Constructs

Given their similar theoretical background and the presence of some shared items, the NFC scale is positively related to the Personal Need for Structure scale (Neuberg and Newsom 1993) and the Intolerance of Ambiguity scale (Eysenck 1954) and negatively related to the Personal Fear of Invalidity scale (Thompson et al. 2001). These relationships, and the negative relation with the Need for Cognition scale (Cacioppo and Petty 1982) are, however, rather modest (i.e., $|r| < 0.30$), confirming that the scales are clearly different in terms of concept and measurement (see Kruglanski and Webster 1996; Webster and Kruglanski 1994).

The NFC scale has shown to be a strong (unique) predictor of a wide variety of interpersonal but also intra- and intergroup phenomena, including conservatism, authoritarianism, essentialism, and prejudice (see Jost et al. 2003; Roets and Van Hiel 2011b; Roets et al. 2015).

Conclusions

The Need for Closure scale measures individual differences in people's need for epistemic security, referring to their desire for swift and stable answers and knowledge as opposed to ambiguity and uncertainty. Both the full, 41- or 42-item scale and a short, 15-item version are frequently used in psychological research, primarily in the domains of social and personality psychology.

Cross-References

- ▶ Authoritarianism
- ▶ Need for Cognition Scale

References

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology, 42*, 116–131.

Crowson, M. H. (2013). Revisiting the factorial validity of the 15-item need for closure scale. *Individual Differences Research, 11*, 133–138.

Eysenck, H. J. (1954). *The psychology of politics*. New York: Praeger.

Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003). Political conservatism as motivated social cognition. *Psychological Bulletin, 129*, 339–375.

Kruglanski, A. W. (1990). Motivations for judging and knowing: Implications for causal attribution. In E. T. Higgins & R. M. Sorrentino (Eds.), *The handbook of motivation and cognition: Foundation of social behavior* (Vol. 2, pp. 333–368). New York: Guilford Press.

Kruglanski, A. W., Webster, D. M., & Klem, A. (1993). Motivated resistance and openness to persuasion in the presence or absence of prior information. *Journal of Personality and Social Psychology, 65*, 861–876.

Kruglanski, A. W., & Webster, D. M. (1996). Motivated closing of the mind: "seizing" and "freezing". *Psychological Review, 103*, 263–283.

Neuberg, S. L & Newsom, J.T. (1993). Personal need for structure: Individual differences in the desire for simpler structure. *Journal of Personality and Social Psychology, 65*, 113–131.

Neuberg, S. L., Judice, T. N., & West, S. G. (1997). What the need for closure scale measures and what it does not: Toward differentiating among related epistemic motives. *Journal of Personality and Social Psychology, 72*, 1396–1412.

Roets, A., & Van Hiel, A. (2007). Separating ability from need: Clarifying the dimensional structure of the need for closure scale. *Personality and Social Psychology Bulletin, 33*, 266–280.

Roets, A., & Van Hiel, A. (2011a). Item selection and validation of a brief, 15-item version of the need for closure scale. *Personality and Individual Differences, 50*, 90–94.

Roets, A., & Van Hiel, A. (2011b). Allport's prejudiced personality today: Need for closure as the motivated cognitive basis of prejudice. *Current Directions in Psychological Science, 26*, 349–354.

Roets, A., Kruglanski, A. W., Kossowska, M., Pierro, A., & Hong, Y.-y. (2015). The motivated gatekeeper of our minds: New directions in need for closure theory and research. *Advances in Experimental Social Psychology, 52*, 221–283.

Thompson, M. M., Naccarato, M. E., Parker, K. C. H., & Moskowitz, G. B. (2001). The Personal need for structure (PNS) and Personal fear of invalidity (PFI) scales: Historical perspectives, present applications and future directions. In G. B. Moskowitz (Ed.), *Cognitive social psychology: The Princeton symposium on the legacy and future of social cognition* (pp. 19–39). Mahwah: Erlbaum.

Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Journal of Personality and Social Psychology, 67*, 1049–1062.

Need for Closure Scale (NFCS)

- ▶ Entry for Need for Closure

Need for Cognition

Ben Bauer and Emily Stiner
Trent University Durham, Oshawa, ON, Canada

Synonyms

Typical intellectual engagement

Definition

An individual difference variable which describes a person's desire to engage in cognitively challenging tasks and effortful thinking.

Introduction

The Need for Cognition (NfC) is a psychological construct that concerns an individual's tendency and enjoyment in seeking, evaluating, and integrating multiple relevant sources of information toward making sense of their surroundings. It captures the extent to which individuals chronically engage in effortful reflection in arriving at an opinion (cognizers; high NfC) or tend to form an opinion based on cursory or superficial aspects (cogmisers; low NfC). This individual differences variable is typically measured with self-report scales. The most commonly used are the long- and short-form Need for Cognition scales (Cacioppo and Petty 1982; Cacioppo et al. 1984), although the Typical Intellectual Engagement scale has been shown to measure a similar construct (Woo et al. 2007; in von Stumm and Ackerman 2013).

Psychometric Properties of NfC Scale

The original 34-item and the short-form 18-item versions of the Need for Cognition scale have both shown high internal consistency reliability, with Cronbach's alpha often reported above 0.8 in large samples (Cacioppo et al. 1996). Good test-retest reliability and split-half reliability have also been established for the Need for Cognition scale. The scale has been shown over many studies to be a valid measure of the Need for Cognition construct and to have acceptable convergent and discriminant validity (Cacioppo et al. 1996). Small-to-no correlation has been found between the Need for Cognition scale and the Marlowe-Crowne Social Desirability scale, suggesting that respondents tend to answer truthfully, rather than in a manner that makes them seem more interested in thinking in order to impress (Cacioppo et al. 1996). It has been translated into several different languages, including Dutch, French, German, Swedish, Romanian, and Chinese, and has maintained high reliability and validity (e.g., Bors et al. 2006).

Need for Cognition was theorized as a unidimensional construct, and most factor analyses conducted on the Need for Cognition scale have supported a single underlying factor. However, some researchers have found evidence of two or more factors that relate to the directionality of the wording of items (positive vs. negative) and other methodological artifacts. Furnham and Thorne (2013) identified three highly intercorrelated factors (need for cognitive challenge, need for understanding, and enjoyment of extensive thought) in a 34-item scale reworded to all be positive, and Tanaka and colleagues (1988) also found three factors (cognitive persistence, cognitive complexity, and cognitive confidence) using the 34-item scale and a dichotomous yes/no response scale (in Cacioppo et al. 1996).

Soubelet and Salthouse (2016) investigated the applicability of the 18-item scale across the lifespan with over 5,000 respondents between ages 18 and 99. They report that this scale taps a "broad construct that could reflect motivation to seek out intellectual challenge" (p. 1) and that it is valid over the range of ages studied. Finally, numerous studies have shown that both the 18-item and original 34-item instruments are gender indiscriminate (Cacioppo et al. 1996).

Outcome Versus Process

Because the level of NfC is proportional to the typical amount of cogitation and self-awareness used in assessing a wide variety of topics rather than the outcome of these processes, it is not always possible to predict the eventual stance or opinion of an individual based on NfC. Individuals anywhere on the scale can manifest faulty judgment or biased decisions though those high (vs. low) in NfC are more likely to correct for biases should they become aware of them. In addition, framing the issue at hand in too simplistic of a manner or removing the motivation to think can result in disincentivizing high NfC individuals to think deeply or enjoy effortful thinking. Similarly, low NfC people can show high NfC characteristics when the issue is of high personal significance, is consistent with their own self-image, or when it is presented in an engaging manner (Petty et al. 2009). That said, high NfC

is associated with many positive outcomes such as more effective study habits, increased critical thinking, better academic outcomes, and resistance to misconceptions about psychology (e.g., Hughes et al. 2015; Petty et al. 2009). Note that the intercorrelations among these variables suggest multiple determinants of the outcomes, but in many cases, NfC accounts for significant variance when other effects are removed statistically. In addition, NfC has been shown to mediate and to be mediated by several of these factors (e.g., Furnham and Thorne 2013). In general, high NfC is associated with a greater consistency between belief and action and with greater confidence in decisions.

Personality Correlates

NfC has been shown to be moderately positively correlated with general intelligence as well as both fluid and crystallized intelligence and general knowledge (von Stumm and Ackerman 2013). It does not appear, however, to be related to working memory (Hill et al. 2013). Despite the robustness of the relationship between NfC and intelligence, some researchers have argued that the observed correlations with verbal intelligence are in fact merely artifacts of the mental energy required to understand and respond to the negatively worded items on the scale (e.g., Bors et al. 2006). However, the finding that NfC is positively associated with varying measures of academic performance has remained robust. Due to the nature of the available analyses, it is not possible to know whether individuals who are high in NfC are therefore more motivated to do well in school or if academic performance instead rewards and leads to increased enjoyment of cognition.

Numerous studies have also shown that NfC is positively correlated with the personality trait openness to experience (e.g., Soubelet and Salthouse 2016). Results of studies attempting to determine the relationship of NfC to other personality traits as set out in the five factor model have been mixed; however NfC does appear to be related to lower levels of neuroticism (Cacioppo et al. 1996).

Conclusion

NfC is a stable individual differences variable that assesses a person's desire to engage in effortful thinking and cognitive challenges. Although NfC only assesses desire and not aptitude, it has been associated with academic performance and both fluid and crystallized intelligence. Cognizers seek out experiences that allow them to think and process information deeply and tend to make decisions based on facts rather than on mental shortcuts, although cogmisers can also be motivated to think more effortfully given certain conditions.

Cross-References

- ▶ Big Five Inventory
- ▶ Intelligence
- ▶ Marlowe-Crowne Social Desirability Scale
- ▶ Needs
- ▶ Need for Achievement
- ▶ Need for Cognition Scale
- ▶ Openness

References

Bors, D. A., Vigneau, F., & Lalande, F. (2006). Measuring the need for cognition: Item polarity, dimensionality, and the relation with ability. *Personality and Individual Differences, 40*, 819–828. https://doi.org/10.1016/j.paid.2005.09.007.

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology, 42*(1), 116–131. https://doi.org/8080/10.1037/0022-3514.42.1.116.

Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment, 48*(3), 306–307. https://doi.org/8080/10.1207/s15327752jpa4803_13.

Cacioppo, J. T., Petty, R. E., Feinstein, J. A., & Jarvis, W. B. G. (1996). Dispositional differences in cognitive motivation: The life and times of individuals varying in need for cognition. *Psychological Bulletin, 119*(2), 197–253. https://doi.org/10.1037/0033-2909.119.2.197.

Furnham, A., & Thorne, J. D. (2013). Need for cognition: Its dimensionality and personality and intelligence correlates. *Journal of Individual Differences, 34*(4), 230–240. https://doi.org/10.1027/1614-0001/a000119.

Hill, B. D., Foster, J. D., Elliott, E. M., Talley Shelton, J., McCain, J., & Gouvier, W. D. (2013). Need for cognition is related to higher general intelligence, fluid

intelligence, and crystallized intelligence, but not working memory. *Journal of Research in Personality, 47*(1), 22–25. https://doi.org/10.1016/j.jrp.2012.11.001.

Hughes, S., Lyddy, F., Kaplan, R., Nichols, A. L., Miller, H., Saad, C. G., Dukes, K., & Lynch, A.-J. (2015). Highly prevalent but not always persistent: Undergraduate and graduate student's misconceptions about psychology. *Teaching of Psychology, 42*(1), 34–42. https://doi.org/10.1177/0098628314562677.

Petty, R. E., Briñol, P., Loersch, C., & McCaslin, M. J. (2009). The need for cognition. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 318–329). New York: Guilford Press.

Soubelet, A., & Salthouse, T. A. (2016). Does need for cognition have the same meaning at different ages? *Assessment*. https://doi.org/10.1177/1073191116636449. Advance online publication.

Tanaka, J.S., Panter, A.T., & Winborne, W. C. (1988). Dimensions of the need for cognition: Subscales and gender differences. *Multivariate Behavioral Research, 23*(1), 35–50. https://doi.org/10.1207/s15327906mbr2301_2.

von Stumm, S., & Ackerman, P. L. (2013). Investment and intellect: A review and meta-analysis. *Psychological Bulletin, 139*(4), 841–869. https://doi.org/10.1037/a0030746.

Woo, S. E., Harms, P.D. & Kuncel, N. R. (2007). Integrating personality and intelligence: typical intellectual engagement and need for cognition. *Personality and Individual Differences, 43*(6), 1635–1639. https://doi.org/10.1016/j.paid.2007.04.022.

Need for Cognition Scale

Douglas A. Bors[1] and Jamie A. Gruman[2]
[1]University of Toronto, Toronto, ON, Canada
[2]University of Guelph, Guelph, ON, Canada

Definition

The need for cognition (NFC) is a primary individual difference in individual's motivation to engage in effortful cognitive activity.

The Need for Cognition

The ability to engage in effortful cognitive activity is adaptive. Psychologists have long studied numerous situational variables that influence the extent to which individuals are motivated to engage in effortful cognitive activity (e.g., Chen et al. 1999). Psychologists are also interested in understanding individual differences in people's tendencies to engage in such activity. A primary individual difference that motivates cognitive processing is the need for cognition (NFC).

The term need for cognition was first used by Cohen et al. (1955) to refer to an individual's need to make the world understandable in coherent, meaningful, ways. In 1982 Cacioppo and Petty reinterpreted NFC as the "tendency to engage in and enjoy thinking" (p. 116). NFC is now typically defined as a "stable individual difference in the tendency to engage in and enjoy cognitively effortful activities across a wide range of domains" (Petty et al. 2009). People who are high in NFC tend to think about many things, including their own thoughts, whereas those low in NFC, because they enjoy thinking less, tend to rely more on other people and various mental shortcuts in their cognitive operations (Cacioppo et al. 1996; Petty et al. 2009). For example, Haugtvedt et al. (1992) found that after being exposed to product advertisements, the product attitudes of people with high NFC were more influenced by product quality information, whereas the attitudes of those with low NFC were more influenced by the attractiveness of the product endorsers.

There are hundreds of studies demonstrating relationships between NFC and various social-personality variables (for a summary see Cacioppo et al. 1996). The following is a selective overview. NFC has been shown to be positively associated with a number of cognitive characteristics such as attributional complexity, basing judgments on rational considerations, and seeking relevant information when decision making (Cacioppo et al. 1996). NFC is also positively associated with motivational and personality variables such as intrinsic motivation (Cacioppo et al. 1996), goal orientation (Fleischhauer et al. 2010), self-regulated learning (Cazan and Indreica 2014), openness to experience, and conscientiousness (Furnham and Thorne 2013; Sadowski and Cogburn 1997). NFC demonstrates inconsistent relationships with extroversion (Furnham and Thorne 2013).

NFC is negatively associated with the cognitive characteristics of dogmatism, cognitive simplification, and need for closure (Cacioppo et al. 1996). It is also negatively associated with motivational and personality variables such as harm avoidance (Fleischhauer et al. 2010), extrinsic motivation, (Cacioppo et al. 1996), and neuroticism (Furnham and Thorne 2013; Sadowski and Cogburn 1997). Most of these relationships are in the modest to moderate range.

Although NFC reflects cognitive motivation and not cognitive ability (Cacioppo et al. 1996), expecting some degree of association between these two constructs is reasonable. However, results of the studies on the relationship between NFC and intelligence have been mixed. Bors et al. (2006) found that NFC was modestly correlated with the Mill Hill vocabulary test. However, Stuart-Hamilton and McDonald (2001) failed to find such a relationship, and Fleischhauer et al. (2010) failed to find a relationship between NFC and crystalized intelligence. Using the WAIS, Hill et al. (2013) found significant positive correlations between NFC and both fluid and crystallized intelligence, but no association with working memory. Also, Fleischhauer et al. (2010) and Day et al. (2007) found positive relationships between NFC and fluid intelligence. However, Bors et al. (2006) found no association between NFC and fluid intelligence as measured by Raven's Advanced Progressive Matrices. In sum, the relationship between NFC and intelligence is inconclusive.

Measurement

With respect to measurement, there are two main scales to measure NFC. Cacioppo and Petty (1982) developed the original 34-item scale which was found to have adequate psychometric properties. A short-form with 18 items was subsequently developed (Cacioppo et al. 1984). Limited evidence suggests adequate test-retest reliability of NFC scales (Cacioppo et al. 1996). Factor analytic studies of the dimensionality of these scales have differed somewhat in their conclusions (Furnhman and Thorne 2013). For example, studies of the 34-item scale have tended to identify three factors (e.g., Tanaka et al. 1988). Using the 18-item scale, Davis et al. (1993) identified only two factors. Using the short form, Bors et al. (2006) found that a trait-method solution, with a single trait factor common to all items and two method factors based on item polarity, fit the data best. Furnham and Thorne (2013) modified the NFC scale by rewording the items so that no reflection was required and found support for one underlying NFC factor and three highly correlated additional factors.

It would be a mistake to believe that individuals high in NFC are invariably more objective in their reasoning and therefore less susceptible to cognitive biases. Petty et al. (2009) explain and summarize evidence demonstrating that although individuals high in NFC are more likely to correct their judgments in response to perceived biases, they are still subject to biases in judgment. However, the mechanisms underlying the bias of those high in NFC are different from those low in NFC. Individuals low in NFC show greater amounts of judgmental bias when the bias involves cognitive heuristics, whereas individuals high in NFC show greater amounts of bias when the bias involves effortful thought. This occurs as a result of the greater elaboration and attention paid to thought among those high in NFC. For example, individuals higher in NFC are more likely to invoke false memories in response to semantically related words (Graham 2007), and generate more mood-congruent thoughts in response to a mood manipulation, rendering such individuals more susceptible to the biasing effect of mood on cognition (Cacioppo et al. 1996; Petty et al. 1993).

Although the majority of research on NFC focuses on intrapersonal cognitive phenomena (Petty et al. 2009), there is research demonstrating that NFC also has effects on interpersonal, behavioral, and perceptual phenomena. For example, relative to individuals who are low in NFC, those high in NFC have been shown to seek more advice from others (Curşeu 2011), engage in less physical activity (McElroy et al. 2016), and use afterimages to assist with image discrimination (Fleischhauer et al. 2014). NFC has also been studied as a group-level phenomenon (Kearney et al. 2009).

Research has established that people demonstrate consistent individual differences in the tendency to engage in and enjoy effortful cognitive activities. This need for cognition is reliably related to a number of attitudes, traits, and behaviors. Future research is needed to better elucidate how NFC fits within the larger network of personality characteristics, and the adaptive value NFC offers those scoring high and low on the construct.

Conclusions

The need for cognition (NFC) is a primary individual difference in individual's motivation to engage in effortful cognitive activity. NFC is positively associated with numerous individual characteristics such as attributional complexity, basing judgments on rational considerations, seeking relevant information when decision making, intrinsic motivation, goal orientation, openness to experience, and conscientiousness. NFC is measured by the Need for Cognition Scale of which two versions exist a 34-item version and an 18-item version. While these scales have been used widely in research their factor structure and reliability are topics of ongoing research and have been called into question.

References

Bors, D. A., Vigneau, F., & Lalande, F. (2006). Measuring the need for cognition: Item polarity, dimensionality, and the relation with ability. *Personality and Individual Differences, 40*, 819–828.

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology, 42*, 116–131.

Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment, 48*, 306–307.

Cacioppo, J. T., Petty, R. E., Feinstein, J. A., & Jarvis, W. B. G. (1996). Dispositional differences in cognitive motivation. The life and times of individuals varying in need for cognition. *Psychological Bulletin, 119*, 197–253.

Cazan, A.-M., & Indreica, S. E. (2014). Need for cognition and approaches to learning among university students. *Procedia – Social and Behavioral Sciences, 127*, 134–138.

Chen, S., Duckworth, K., & Chaiken, S. (1999). Motivated heuristic and systematic processing. *Psychological Inquiry, 10*, 44–49.

Cohen, A. R., Stotland, E., & Wolfe, D. M. (1955). An experimental investigation of need for cognition. *Journal of Abnormal and Social Psychology, 51*, 291–294.

Curşeu, P. L. (2011). Need for cognition and active search in small student groups. *Learning and Individual Differences, 21*, 415–418.

Davis, T., Severy, L. J., Krauss, S. J., & Whitaker, J. M. (1993). Predictors of sentencing decisions: The beliefs, personality variables, and demographic factors of juvenile justice personnel. *Journal of Applied Social Psychology, 23*, 451–477.

Day, E. A., Espejo, J., Kowollik, V., Boatman, P. R., & McEntire, L. E. (2007). Modeling the links between need for cognition and the acquisition of a complex skill. *Personality and Individual Differences, 42*, 201–212.

Fleischhauer, M., Enge, S., Brocke, B., Ullrich, J., Strobel, A., & Strobel, A. (2010). Same or different? Clarifying the relationship of need for cognition to personality and intelligence. *Personality and Social Psychology Bulletin, 36*, 82–96.

Fleischhauer, M., Miller, R., Enge, S., & Albrecht, T. (2014). Need for cognition relates to low-level visual performance in a metacontrast masking paradigm. *Journal of Research in Personality, 48*, 45–50.

Furnham, A., & Thorne, J. D. (2013). Need for cognition: Its dimensionality and personality and intelligence correlates. *Journal of Individual Differences, 34*, 230–240.

Graham, L. M. (2007). Need for cognition and false memory in the Deese-Roediger-McDermott paradigm. *Personality and Individual Differences, 42*, 409–418.

Haugtvedt, C. P., Petty, R. E., & Cacioppo, J. T. (1992). Need for cognition and advertising: Understanding the role of personality variables in consumer behavior. *Journal of Consumer Psychology, 1*, 239–260.

Hill, B., Foster, J., Elliott, E., Shelton, J., McCain, J., & Gouvier, W. (2013). Need for cognition is related to higher general intelligence, fluid intelligence, and crystallized intelligence, but not working memory. *Journal of Research in Personality, 47*, 22–25.

Kearney, E., Gebert, D., & Voelpel, S. C. (2009). When and how diversity benefits teams: The importance of team members' need for cognition. *Academy of Management Journal, 52*, 581–598.

McElroy, T., Dickinson, D. L., Stroh, N., & Dickinson, C. A. (2016). The physical sacrifice of thinking: Investigating the relationship between thinking and physical activity in everyday life. *Journal of Health Psychology, 21*, 1750–1757.

Petty, R. E., Schumann, D. W., Richman, S. A., & Strathman, A. J. (1993). Positive mood and persuasion: Different roles for affect under high and low elaboration conditions. *Journal of Personality and Social Psychology, 64*, 5–20.

Petty, R. E., Briñol, P., Loersch, C., & McCaslin, M. J. (2009). The need for cognition. In M. R. Leary & R. H.

Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 318–329). New York: The Guilford Press.
Sadowski, C. J., & Cogburn, H. E. (1997). Need for cognition in the big-five factor structure. *The Journal of Psychology, 13*, 307–312.
Stuart-Hamilton, I., & McDonald, L. (2001). Do we need intelligence? Some reflections on the perceived importance of "g". *Educational Gerontology, 27*, 399–407.
Tanaka, J. S., Panter, A. T., & Winborne, W. C. (1988). Dimensions of the need for cognition: Subscales and gender differences. *Multivariate Behavioral Research, 23*, 35–50.

Need for Cognitive Closure

► Entry for Need for Closure

Need for Competence, The

Lisa Legault
Clarkson University, Potsdam, NY, USA

Synonyms

Capability; Effectiveness; Mastery; Optimal challenge

Definition

Competence is the psychological need to exert a meaningful effect on one's environment. It refers to the innate propensity to develop skill and ability, and to experience effectance in action. Competence promotes the pursuit of challenging and deeply satisfying experiences and is a criterion for psychological growth and well-being.

Introduction

When people do not feel capable and effective, their motivation plummets and they suffer ill-being. Conversely, the experience of mastery leads to feelings of personal satisfaction, vitality, interest, and well-being (Deci and Ryan 2008). This fundamental connection between competence and human thriving suggests that it is a psychological prerequisite for growth and psychological health. Indeed, human beings have an inherent tendency to develop themselves. This means that they actively strive to become effective, to master their environments, and to hone their capacities in order to reach their innate potential (Deci and Ryan 2002; Harter 1983). This inborn need for competence appears to be universal – it is essential for individuals across cultures (e.g., Vlachopoulos et al. 2013). However, while the trajectory toward competence is innate, it cannot be assumed; rather, the attainment of competence requires feedback and support from the environment. When an event in the environment increases perceived competence (e.g., positive and informative feedback), interest and engagement will be enhanced; but when an event in the environment diminishes perceived competence (e.g., demeaning criticism), interest and engagement will be hindered.

Competence and Optimal Challenge

The need for competence fuels persistence, sustained effort and attention, and the determination to improve. It is the reason people generally prefer tasks that are challenging rather than boring or easy. In other words, the need for competence drives the desire to seek out optimal challenges. When people engage in optimally difficult and complex activities, their talents and skills are stimulated at a developmentally suitable level. This produces a deeply satisfying perception of competence in the moment, which generates interest and energy for continued activity. When challenges and skills are perfectly matched, people experience a state of *flow* – a subjective experience of intense focus and concentration where action and awareness are fused, time is distorted, and a feeling of deep effectiveness and control over one's actions emerges (Csikszentmihalyi 2000). Such experiences often occur during "just-manageable" tasks – where challenges are neither too low nor too high, but rather *just equal to* skill-level.

Satisfying the Need for Competence

Given that optimally challenging experiences provide the conditions needed to experience perceived competence and flow, how can such experiences be cultivated? Because individuals are continuously and fundamentally involved in an ongoing exchange with their environment, their sense of perceived competence depends largely on the degree to which the social environment can provide competence-satisfying conditions. There are three important ways in which the social environment can help to facilitate perceived competence and flow: (1) providing structure and guidance, (2) relaying information and feedback, and (3) tolerating errors and failures (Reeve 2014).

Clear structure and detailed guidance provide people with skill-building assistance. Good structure involves goals that are clear, explicit, and understandable. Moreover, when instructions provide useful tips to improve and succeed (rather than directives that are confusing, ambiguous, or absent), people are more likely to feel competent.

Similarly, feedback is critical to competence and progress; without accurate and timely feedback, the effectiveness of action is impossible to discern. Feedback can be derived from the task itself – such as when fixing a computer (or not), or completing a crossword puzzle (or not). Alternately, feedback can come from personal comparisons to one's own past performances (e.g., either gaining or losing time on one's previous jogging pace); or from interpersonal comparisons with others (e.g., performing better or worse than others on a test). Regardless of the format, positive feedback generally indicates competence, whereas negative feedback signals incompetence. However, what is of utmost importance to satisfying the need for competence is useful and constructive information that will enable the development and elaboration of skills and capacities.

Finally, competence satisfaction is facilitated by situations and environments that offer the opportunity to make (and thus learn from) mistakes and failures. Optimally challenging tasks and situations *necessitate* the frequent occurrence of failure – it is only through these failures that talents and abilities can be improved. If individuals fear reprimand for errors and failures, they may avoid challenging and skill-building opportunities (Clifford 1990).

Conclusion

Competence is the perception of effectiveness in one's dynamic exchange with the social world. It also refers to the search for opportunities to exercise and develop one's capabilities (e.g., abilities, skills, effort capacity), that is, to experience optimal challenges. Rather than reflecting a static state of being competent or skillful at something, the need for competence is ongoing and promotes persistence and continued action.

Cross-References

- ▶ Intrinsic and Extrinsic Motivation
- ▶ Need for Autonomy, The
- ▶ Self-Determination Theory

N

References

Clifford, M. M. (1990). Students need challenge, not easy success. *Educational Leadership, 48*, 22–26.

Csikszentmihalyi, M. (2000). *Beyond boredom and anxiety*. San Francisco: Jossey-Bass.

Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research*. Rochester: University Rochester Press.

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory on human motivation, development, and health. *Canadian Psychology, 49*, 182–185.

Harter, S. (1983). Developmental perspectives on the self-system. In E. M. Hetherington (Ed.), *Handbook of child psychology, Socialization, personality and social development* (Vol. 4, 4th ed., pp. 275–386). New York: Wiley.

Reeve, J. (2014). *Understanding motivation and emotion*. Hoboken: Wiley.

Vlachopoulos, S. P., Asci, F. H., Cid, L., Ersoz, G., González-Cutre, D., Moreno-Murcia, J. A., & Moutão, J. (2013). Cross-cultural invariance of the basic psychological needs in exercise scale and need satisfaction latent mean differences among Greek, Spanish, Portuguese and Turkish samples. *Psychology of Sport and Exercise, 14*, 622–631.

Need for Interpersonal Intimacy

► Intimacy Motive

Need for Intimacy

► Need for Privacy

Need for Love and Belonging

► Intimacy Motive

Need for Power

Klara Królewiak
SWPS University of Social Sciences and Humanities, Warsaw, Poland

Synonyms

nPower; Power motivation; Power motive

Definition

The need for power is a motivational disposition to take pleasure out of having impact on others or the environment in general and to feel aversion to others' influence on oneself.

Introduction

According to McClelland (1961) the need for power (nPower) is one of three basic types of human motivation (along with the need for achievement and the need for affiliation). Power motivation can be conceptualized as two distinguishable motives: personalized (pPower) and socialized (sPower; e.g., McClelland 1970, 1975, Winter 1973). Personalized power and socialized power are convergent in the desire to have influence on others but divergent in their final consequences.

Personalized and Socialized Power

The need for power can be expressed in many different ways. Primarily it has been associated with aggressive and antisocial behaviors. Therefore, this type of nPower has a negative connotation in society and is not socially desirable motivation. However, one can also express power motives through more benevolent and prosocial actions like providing help or advice. The former is labeled as "personalized power" and the latter as "socialized power" (McClelland 1970, 1975; Winter 1973).

Personalized power is a desire for direct control or dominance for self-serving and even antisocial ends. Individuals particularly motivated by pPower both see life as a "zero-sum game" and also have a "me-against-the-world" attitude (McClelland 1975). They often pay little attention to the needs and thoughts of others. Personalized pPower has been associated with the acquisition of prestigious possessions (Winter 1973) and vertical individualism (Torelli and Shavitt 2010).

Socialized power, on the other hand, is manifested indirectly by helping others through guiding or supporting them (McAdams 1985) which is a more acceptable form of power. Individuals high in sPower have a one-with-the-world outlook (McClelland 1987). Socialized nPower is positively related to prosocial decision-making (Magee and Langner 2008) and horizontal collectivism (Torelli and Shavitt 2010).

Gender Differences in the Expression of nPower

Aggressive power expression, associated with pPower, is often described as higher in men than women. Moreover, men more frequently than women choose careers that involve leadership.

Women, on the other hand, manifest their power motive through offering unsolicited help to others. As a consequence, women high in nPower prefer occupations related to helping rather than centered on personal dominance (e.g., teachers). It can be explained by the fact that during socialization men become more oriented to personal dominance than women and women are more focused on others (e.g., McClelland 1975; Winter 1988).

Explicit and Implicit Measures of the Need for Power

As other basic motivational constructs, the power motive can operate implicitly or explicitly. The implicit and explicit needs for power are measured differently and are highly independent of each other (Köllner and Schultheiss 2014).

The implicit power motivation is not consciously accessible and must be measured indirectly, usually with an adapted form of the Thematic Apperception Test or other written responses to a motive-eliciting stimulus or situation (for instance, Picture Story Exercise – PSE). The implicit nPower usually predicts task performance.

In contrast, explicit power motivation is assessed by self-reports and is more likely to predict judgements and conscious decision-making than performance.

Individual and Biological Correlates of the Need for Power

There is evidence that the need for power is positively correlated with baseline testosterone – power-motivated individuals have higher testosterone (cf. Stanton and Schultheiss 2009). Nevertheless, the correlation is rather low, which implies that there are also other factors shaping individuals' nPower like heritability, parenting styles, and life experience (McClelland 1987). Yet, the relationship between nPower and testosterone seems to be more complex. For instance, research has shown that, when individuals engage in dominance situations, the changes in their testosterone levels depend not only on their nPower but also on whether they win or lose. Testosterone increases after a victory and decreases after a defeat and these changes are more significant in power-motivated individuals (cf. Stanton and Schultheiss 2009).

Much as the link between testosterone and the power motive in men is clear, the relationship between testosterone in women and nPower in women is inconsistent (see Stanton and Edelstein 2009 for a review). Potential explanation of this incoherence can be provided by studies on relationship between estradiol and power motive in women. Yet, there are just a few studies concerning the topic; their findings suggest that estradiol may play a similar role in women's nPower to that of testosterone in men (Stanton and Edelstein 2009; Stanton and Schultheiss 2009).

Conclusion

The need for power is a complex disposition which is related to a number of diverse behaviors, from physical or psychological aggression through gaining a reputation of an important person to, finally, providing advice or help.

Cross-References

- McClelland, David C.
- Need for Achievement
- Need for Affiliation
- Needs
- Thematic Apperception Test

References

Köllner, M. G., & Schultheiss, O. C. (2014). Meta-analytic evidence of low convergence between implicit and explicit measures of the needs for achievement, affiliation, and power. *Frontiers in Psychology, 5*, 826. https://doi.org/10.3389/fpsyg.2014.00826.

Magee, J. C., & Langner, C. (2008). How personalized and socialized power motivation facilitate antisocial and prosocial decision-making. *Journal of Research in Personality, 42*, 1547–1559.

McAdams, D. P. (1985). *Power, intimacy, and the life story: Personological inquiries into identity.* Homewood: Dorsey Press.

McClelland, D. C. (1961). *The achieving society*. Princeton: Van Nostrand.
McClelland, D. C. (1970). The two faces of power. *Journal of International Affairs, 24*, 29–47.
McClelland, D. C. (1975). *Power: The inner experience*. Nowy Jork: Wiley.
McClelland, D. C. (1987). *Human motivation*. Cambridge: Nowy Jork.
Stanton, S. J., & Edelstein, R. S. (2009). The physiology of women's power motive: Implicit power motivation is positively associated with estradiol levels in women. *Journal of Research in Personality, 43*, 1109–1113.
Stanton, S. J., & Schultheiss, O. C. (2009). The hormonal correlates of implicit power motivation. *Journal of Research in Personality, 43*, 942–949.
Torelli, C. J., & Shavitt, S. (2010). Culture and concepts of power. *Journal of Personality and Social Psychology, 99*, 703–723.
Winter, D. G. (1973). *The power motive*. Nowy Jork: Macmillan.
Winter, D. G. (1988). The power motive in women – and men. *Journal of Personality and Social Psychology, 54*, 510–519.

Need for Privacy

Sabine Trepte and Philipp K. Masur
Department of Media Psychology, University of Hohenheim, Stuttgart, Germany

Synonyms

Desire to be left alone; Need for anonymity; Need for intimacy; Need for reserve; Need for solitude; Need for withdrawal

Definition

An individual's need to selectively control the access of others to the individual self with the aim of achieving a desired level of physical or psychological privacy – in other words, a form of solitude, intimacy, anonymity, or reserve.

Introduction

People want privacy under many circumstances. In fact, when people say "I want my privacy" or claim "Privacy please!" the message behind these demands can have several meanings. In one situation, it could simply mean that the person wants to be left alone. Under other circumstances, however, an individual may want to emphasize that another person is not allowed to know about a certain type of information, or the individual may want to prevent unwanted enquiries. From time to time, people seek physical or mental conditions under which they feel free from surveillance or interference by others, or they seek conditions where they can simply remain undisturbed by stimulation. They may temporarily wish to escape from contact and interaction with other people. The need for privacy becomes particularly urgent when more fundamental needs (e.g., autonomy) are threatened and sociocultural privacy norms are violated. To understand the need for privacy, it is important to define both privacy and what contemporary psychologists mean when they refer to needs.

Theoretical Background

Concepts and theories of privacy originate from different disciplines. In the social sciences and in psychology in particular, most scholars have developed concepts that can be subsumed under the limited access approach. For example, Westin (1967) argued that "privacy is the voluntary and temporary withdrawal of a person from general society through physical or psychological means, either in a state of solitude or small-group intimacy or, when among larger groups, in a condition of anonymity or reserve" (p. 5). Altman (1975) further defined privacy as "selective control of access to the self or to one's group" (p. 18) and an interpersonal boundary-control process. People constantly evaluate whether their desired level of privacy is equal to their achieved level of privacy. Either too little or too much privacy can be unsatisfactory and may hence motivate people to achieve their desired level of privacy. Altman's (1975) theory was further advanced by Petronio (2002) who theorized that individuals follow established rules and collaboratively develop new rules to control the flow of private

information. According to Westin (1967), different states of privacy can be differentiated, namely, solitude, intimacy, anonymity, and reserve. Westin (1967) further posited that privacy is "the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others" (p. 5). Claims of privacy thus involve claims about control over information.

Burgoon (1982) differentiated four dimensions of privacy. The need for privacy thus refers to the need to control (a) the amount and content of information released about the self (informational privacy), (b) one's social relationships, interactions, and encounters (social privacy), (c) psychological inputs and outputs (e.g., stimulation and disclosure of feelings or thoughts, psychological privacy), and (d) the physical accessibility of one's body (physical privacy).

A *need* can be understood as an internal motivation that was originally thought to be inborn and universally present in all humans (Doyal and Gough 1991). Although different motivational theories exist, a need may generally be defined as the motivational force that is activated in a state of deprivation. The motivating aspect of a need is the pleasant condition that a person anticipates will be achieved through the elimination of the specific deficiency. The most influential need theories have posited a number of fundamental needs that guide human behavior (Doyal and Gough 1991).

The *need for privacy* must be understood as a secondary need because it describes the temporary desire for a condition or state in which the fulfillment of more *fundamental needs* becomes possible. Westin (1967) proposed that privacy can serve to satisfy needs for autonomy, emotional release, self-evaluation, and limited and protected communication. Privacy is hence an instrument for achieving goals as part of an individual's self-realization. For example, protected and limited communication is necessary to make and sustain meaningful relationships, which, in turn, are a precondition for satisfying social needs. Pedersen (1999; see also the "Measuring the Need for Privacy" section) later tested and refined these functions and proposed that different states of privacy allow for autonomy, confiding, rejuvenation, contemplation, and creativity. The need for privacy must hence be regarded as a need to seek a certain condition or state that, in turn, allows for the satisfaction of more fundamental needs.

Perspectives on the Need for Privacy

The Need for Privacy in the Sociocultural Context

In virtually all societies, people seek privacy from time to time. This can be demonstrated with two examples from classic anthropological studies (for more examples, see Altman 1975; Westin 1967): Even in primitive societies such as tribes from Java where physical boundaries such as doors, walls, or single households do not exist, people achieve privacy by speaking softly or by hiding their feelings even in their homes. Likewise, the Tuareg tribes of North Africa achieve a comparable psychological barrier by hiding parts of their faces with veils. Depending on their social interactions, they adjust the veils in order to reveal or conceal their faces. Each society thus creates distinct mechanisms to safeguard people's privacy. In summary, it is important to acknowledge that different cultural circumstances and norms foster different types of privacy needs.

The Need for Privacy Across the Life Span

When, what type, and how much privacy is needed changes across the life span. This process is especially influenced by the development of a sense of self and its implications for the need for autonomy, the extent and types of interactions with others (specifically within the family in early childhood), and the individual's general abilities and emotional maturity (Peter and Valkenburg 2011; Wolfe and Laufer 1974). Experiences of separation throughout the different life stages (e.g., the growing separation of a young child from his/her mother, a young adolescent's disconnectedness from his/her parents) and processes of individuation (experiences of autonomy, creativity, emotionality in conditions of solitude or reserve) affect the perception of privacy and consequently cause different circumstances to evoke the need for privacy (Buss 2001). Marshall

(1974), for example, demonstrated that the need for privacy was expressed differently by young adolescents and their parents: Whereas the students who participated in her survey expressed intimacy by disclosing private matters to friends, adults emphasized their intimacy by claiming its confidentiality.

The Need for Privacy in Online Media

Online media have imposed a number of changes in how people deal with private information (Trepte and Reinecke 2011). Users of online data share personal information with each other, but the rules of interpersonal communication are not yet as set as they are in face-to-face communication. Research on the need for privacy in online contexts has demonstrated that, in particular, individuals with a high need for privacy are less likely to use social network sites such as Facebook (Błachnio et al. 2016). Further, research has demonstrated that users who have a stronger need for privacy also more strongly believe in their right to privacy (Yao et al. 2007): Individuals claiming the need for privacy also claim that they have the rights to be left alone, to control their personal information, and to use the internet anonymously; and in turn, these users are more concerned about their online privacy (Yao et al. 2007). In other words, the psychological need for privacy may be a buffering factor against unhealthy and unsecure uses of online communication.

Measuring the Need for Privacy

The *Privacy Preference Scale* (PPS) was the first scale that was designed to measure the need for privacy (Marshall 1974). It differentiates six factors: intimacy (desire to disclose to friends or family), solitude (wish to be alone, secluded or far from others), not neighboring (orientation toward faraway friendships that can more easily be controlled than neighbors who incidentally "break" into personal space), seclusion (desire for visual and auditory seclusion of the home), anonymity (wish to be unknown in a larger city), and reserve (wish to disclose as little as possible about oneself). The final scale consists of 56 items and was developed on the basis of item and scale analyses in different samples. It was further subject to validations with privacy-oriented behaviors and personality factors.

Pedersen (1979) published the *Privacy Questionnaire (Pedersen-PQ)*, which has six dimensions very similar to those of Marshall's (1974) PPS: reserve, isolation, solitary, intimacy with family, intimacy with friends, and anonymity. Although Pedersen's (1979) privacy functions have attracted quite a bit of attention, the Pedersen-PQ was not as widely used as the other scales presented here (for an exemption, cf. Blachnio et al.'s (2016) work referred to in the above section "The need for privacy in online media").

Later, Buss (2001) created the *Privacy Questionnaire (Buss-PQ)* to measure the need for privacy. The Buss-PQ consists of three factors: self-disclosure (the desire to draw a boundary between oneself and others), concealment (fear of being surveilled in private situations), and personal space (preference for seclusion over being physically in touch with others). All of these factors are positively correlated with shyness and emotional loneliness. The Buss-PQ has been used in a number of studies, including the one by Yao et al. (2007; see the above section "The Need for Privacy in Online Media").

On the basis of the tenets of the Buss-PQ and Burgoon's (1982), four dimensions of privacy (cf. section "Theoretical background"), Trepte and Masur (2017) suggested the *Need for Privacy Questionnaire (NFP-Q)*. It consists of three factors: informational privacy (e.g., I do not want my data to be publicly accessible; I prefer to remain unknown), physical privacy (e.g., I do not like unknown people to come physically close; I do not like to sit next to an unknown person on the bus or tube), and interactional privacy (e.g., I have a hard time talking about myself; I feel awkward when others share private information about their lives). The scale was subject to item and scale analyses and was validated according to privacy knowledge and concerns (Trepte and Masur 2017).

Conclusion

The need for privacy has always been a psychological measure of utmost importance because it

manifests itself in each and every interpersonal relationship and interaction that a person has. Buss (2001) even went so far as to say that only by experiencing privacy, people can experience their true self: "If I can control what is me and not me, if I can define what is me and not me, and if I can observe the limits and scope of my control, then I have taken major steps toward understanding and defining what I am" (p. 211).

In recent years, individuals have felt that their need for privacy has been particularly challenged by online media. Here, information can easily be passed on to other individuals, and it may be archived and altered to serve the needs of others. Hence, the individual's control over the boundaries and limits of the self seems to be blurred. However, individuals still experience the need to feel private. Current research on privacy needs revolves around this dialectic and addresses the questions of how the basic and important human need for privacy will be achieved in times where interpersonal boundaries are not as clear as before.

Cross-References

- ▶ Maslow's Hierarchy of Needs
- ▶ Need for Autonomy, The
- ▶ Need to Belong
- ▶ Self-Actualization Needs
- ▶ Self-Concealment Scale
- ▶ Self-Determination Theory
- ▶ Self-Disclosure
- ▶ Self-Regulation

References

Altman, I. (1975). *The environment and social behavior: Privacy, personal space, territory, crowding*. Monterey: Brooks/Cole Publishing Company.

Błachnio, A., Przepiorka, A., Boruch, W., & Bałakier, E. (2016). Self-presentation styles, privacy, and loneliness as predictors of Facebook use in young people. *Personality and Individual Differences, 94*, 26–31. https://doi.org/10.1016/j.paid.2015.12.051.

Burgoon, M. (Ed.). (1982). *Communication yearbook 6*. Beverly Hills: Sage.

Buss, A. (2001). *Psychological dimensions of the self*. Thousand Oaks: Sage.

Doyal, L., & Gough, I. (1991). *A theory of human need*. Basingstoke: MacMillan.

Marshall, N. J. (1974). Dimensions of privacy preferences. *Multivariate Behavioral Research, 9*(3), 255–271.

Pedersen, D. M. (1979). Dimensions of privacy. *Perceptual and Motor Skills, 48*(3c), 1291–1297. https://doi.org/10.2466/pms.1979.48.3c.1291.

Pedersen, D. M. (1999). Model for types of privacy by privacy functions. *Journal of Environmental Psychology, 19*, 397–405.

Peter, J., & Valkenburg, P. M. (2011). Adolescents' online privacy: Toward a developmental perspective. In S. Trepte & L. Reinecke (Eds.), *Privacy online. Perspectives on privacy and self-disclosure in the social web* (pp. 221–234). Berlin: Springer.

Petronio, S. (2002). *Boundaries of privacy*. Albany: State University of New York Press.

Trepte, S., & Masur, P. K. (2017). *The Need for Privacy Questionnaire (NFP-Q)*. Retrieved from: https://www.uni-hohenheim.de/fileadmin/einrichtungen/psych/Dateien/Publikationen/Trepte_Masur_2017_Need_for_Privacy_Questionnaire_NFP-Q.pdf

Trepte, S., & Reinecke, L. (Eds.). (2011). *Privacy online. Perspectives on privacy and self-disclosure in the social web*. Berlin: Springer.

Westin, A. F. (1967). *Privacy and freedom*. New York: Atheneum.

Wolfe, M., & Laufer, R. (1974). The concept of privacy in childhood and adolescence. In D. H. Carson (Series Ed.) & S. T. Margulis (Vol. Ed.), *Man-environment interactions: Evaluations and applications; The state of the art in environmental design research. Privacy* (pp. 29–54). Stroudsburg: Dowden, Hutchinson & Ross.

Yao, M. Z., Rice, R. E., & Wallis, K. (2007). Predicting user concerns about online privacy. *Journal of the American Society for Information Science and Technology, 58*(5), 710–722. https://doi.org/10.1002/asi.20530.

N

Need for Reserve

▶ Need for Privacy

Need for Solitude

▶ Need for Privacy

Need for Withdrawal

▶ Need for Privacy

Need to Belong

► Social Monitoring System

Need to Belong (Baumeister and Leary)

Lukas K. Sotola and Kristine M. Kelly
Western Illinois University, Macomb, IL, USA

Synonyms

Affiliation; Social acceptance; Social inclusion

Definition

The human requirement for a number of long-term, positive relationships with other people that involve mutual affection.

Introduction

The need to belong (NTB) is the biological human need for relationships with other people (Baumeister and Leary 1995). Social connections can include friends, romantic partners, and family members. There are two components to this need: First, interactions with relational partners must be frequent and at least somewhat positive. Second, the individual must perceive that there is mutual affection in a given relationship and that it will continue for the foreseeable future. People's NTB can be *satiated*, meaning that the quantity and quality of their interpersonal connections are satisfying, reducing their motivation to seek out new relational partners.

NTB is an individual difference variable whereby some individuals have a stronger NTB than others. Those with a high NTB will need more relationships to reach satiety compared to their low-NTB counterparts. For example, one person may need only one or two close relationships to satisfy their NTB, but another person may need many more.

According to NTB theory, some relationships are subject to *substitution*, wherein one relational partner is replaced with a different person. For example, if one loses contact with a friend or breaks up with a romantic partner, the individual is likely to replace these relationships with other people.

Empirical Support

Much research since Baumeister and Leary's (1995) original formulation has supported their predictions, demonstrating the importance of acceptance to human psychology. Individuals high in NTB tend to be good at interpreting social cues as well as focusing on and remembering relevant social information (Gardner et al. 2005). Compared to their low NTB counterparts, people with a strong NTB motivation also spend more time thinking of loved ones, looking at their photographs, rereading emails from them, and engage in more parasocial relationships, such as feeling a close connection with their favorite television characters (Gardner and Knowles 2008).

Most of the studies done in this area have focused on the negative effects of a thwarted NTB, usually experienced as social rejection or ostracism. Even in simulated and often unrealistic rejection situations, individuals report intense threats to their belonging needs. For example, Zadro et al. (2004) investigated the extent to which people are distressed by being excluded or ignored by others. Results of this study showed that when participants were ostracized during a computerized ball-tossing game, they felt rejected even when they knew ahead of time that their partners in the game were not real people but digital representations programmed by the researcher. The mere exposure to exclusion cues (e.g., the word "ignored" flashed on a computer screen) was associated with less positive self-appraisals than exposure to acceptance (e.g., "welcomed") and aversive control (e.g., "pain") cues (Sommer and Baumeister 2002). These results are particularly interesting, given that the

participants were not actually excluded but rather exposed to words that implied exclusion. Furthermore, these words appeared so fast that the participants did not have enough time to consciously process them. Thus, various types of exclusionary experiences have been shown to play a considerable role in threatening belonging needs.

Baumeister and Leary (1995) argued that as an important, biological human need, the NTB should affect three broad areas: cognition, behavior, and emotion. Indeed, studies have shown that an unsatisfied NTB has effects on cognition, such as enhanced recall of past social events and more accurate perceptions of emotional faces (Gardner et al. 2005). Thus, when the NTB is not met, it affects the way people think about the social world in ways that will facilitate the acquisition of social connections. Other experiments suggest that people show both negative behavioral reactions toward people who reject them and more positive behavioral reactions to new potential relationship partners following rejection by someone else (Leary and Kelly 2009).

Research on emotional reactions to rejection has been mixed. Some data suggest that there is no difference between the emotional states of those who were rejected versus those who were not, while other studies suggest a negative emotional reaction following rejection, including sadness, embarrassment, and hurt feelings (see Leary and Kelly 2009, for a review). Despite these varied findings, it is clear that threats to individuals' NTB affects the way they think, act, and feel, moving them toward other people and making them more aware of what is going on with their social situation and interpersonal connections.

Because the NTB is so important, it may not be surprising that threats to its fulfillment are associated with a physical alarm system. Rejection is experienced as *painful* and is an important risk factor for physical and mental illnesses. Indeed, the feeling of being rejected has even been linked to the same brain areas as feeling physical pain. Neuroscience research suggests that the dorsal anterior cingulate cortex and the anterior insula are brain regions responsible for both the emotional response to physical pain – such as that experienced from injuries – and social pain – such as that experienced following rejection (Eisenberger 2012). It seems that broken hearts can feel as painful as broken bones. Social pain can also be alleviated with medication the same way as physical pain is treated. DeWall et al. (2010) showed that ingesting acetaminophen reduced both emotional distress and neural brain activity in the dorsal anterior cingulate cortex and the anterior insula after social rejection. Recent research indicates that social rejection causes the brain to release opioids, natural painkillers which reduce the emotional and physical pain (Hsu et al. 2013). Thus, it seems that there are natural brain chemicals working to ease the pain of rejection. Taken as a whole, the results of these studies demonstrate that threats to the NTB are both psychologically and physically painful, suggesting that the NTB is so pervasive that the value of being included must be far-reaching.

Measuring Individual Differences in the Need to Belong

A Need to Belong Scale (Leary et al. 2013) has been developed to assess individual differences in people's NTB. This measure has shown good reliability and construct validity and has been widely used in research investigating various aspects of belongingness. Individuals scoring high in NTB are especially anxious about acceptance and belonging. As a result, these concerns lead them to pursue a large number of relationships, strive to maintain their existing relationships, and worry about how they are perceived to others. Thus, the NTB includes characteristics that are both positive (e.g., desire for affiliation) and negative (e.g., worry and anxiety), and Leary et al. reported on large number of studies to provide evidence that the Need to Belong Scale taps into both the positive and negative aspects of the NTB. The positive, approach-oriented facets can be seen in the pattern of correlations between Need to Belong Scale scores and affiliation motivation, sociability, agreeableness, and valuing interpersonal relationships. On the other hand, Need to Belong Scale scores are also correlated with traits like fear of criticism, neuroticism, and

anxious attachment, suggesting that social connections may be desired to avoid negative affect.

Conclusion

The need to belong, the fundamental human need for a number of social relationships that last for a long time and involve mutual concern, has garnered a wealth of empirical support over the past two decades. Overall, the research shows that people are propelled to cultivate social bonds with others and react strongly when their sense of belonging is not satisfied. Reactions to an unsatisfied need to belong include emotional, cognitive, behavioral, physical, and psychological, and all of these responses motivate people to behave in ways that will facilitate their interpersonal acceptance and maintain their existing social relationships.

Cross-References

- ▶ Love and Belongingness Needs
- ▶ Need for Affiliation
- ▶ Ostracism
- ▶ Rejection

References

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*(3), 497–529.

DeWall, C. N., MacDonald, G., Webster, G. D., Masten, C. L., Baumeister, R. F., Powell, C., et al. (2010). Acetaminophen reduces social pain: Behavioral and neural evidence. *Psychological Science, 21*, 931–937.

Eisenberger, N. I. (2012). Broken hearts and broken bones: A neural perspective on the similarities between social and physical pain. *Current Directions in Psychological Science, 21*(1), 42–47.

Gardner, W. L., & Knowles, M. L. (2008). Love makes you real: Favorite television characters are perceived as "real" in a social facilitation paradigm. *Social Cognition, 26*, 156–168.

Gardner, W. L., Pickett, C. L., Jefferis, V., & Knowles, M. (2005). On the outside looking in: Loneliness and social monitoring. *Personality and Social Psychology Bulletin, 31*(11), 1549–1560.

Hsu, D. T., Sanford, B. J., Meyers, K. K., Love, T. M., Hazlett, K. E., Wang, H., et al. (2013). Response of the mu-opioid system to social rejection and acceptance. *Molecular Psychiatry, 18*, 1211–1217.

Leary, M. R., & Kelly, K. M. (2009). Belonging motivation. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of individual differences in social behavior*. New York: Guilford.

Leary, M. R., Kelly, K. M., Cottrell, C. A., & Schreindorfer, L. S. (2013). Construct validity of the need to belong scale: Mapping the nomological network. *Journal of Personality Assessment, 95*(6), 610–624.

Sommer, K. L., & Baumeister, R. F. (2002). Self-evaluation, persistence, and performance following implicit rejection: The role of trait self-esteem. *Personality and Social Psychology Bulletin, 28*, 926–938.

Zadro, L., Williams, K. D., & Richardson, R. (2004). How low can you go? Ostracism by a computer is sufficient to lower self-reported levels of belonging, control, self-esteem, and meaningful existence. *Journal of Experimental Social Psychology, 40*, 560–567.

Needs

Fabrizio Bracco
University of Genoa, Genoa, Italy

Synonyms

Drives; Motives

Definition

Needs are innate psychological nutriments that are essential for ongoing psychological growth, integrity, and well-being (Deci and Ryan 2000, p. 229).

Introduction

As with many other concepts in the history of psychology, the definition of needs has been controversial, multifaceted, and even ambiguous. Definitions, theoretical models, and methodological approaches to psychological needs can vary according to some characteristics such as: (i) the goal (survive or thrive); (ii) the source (genetic or

learned); (iii) the level of analysis (biological, individual, or social); (iv) the conceptual structure (hierarchical or independent); and (v) the number of needs.

Concerning the *goal* of human needs, some theories focus on the essential requirements for survival (physiological needs and protection), which often have priority over other forms of behavior, are more relevant in our early life, and have many aspects in common with other animals. In this perspective, the physiological needs arise whenever the homeostasis is unbalanced and the goal of the organism is to regain the equilibrium. Modern theories of psychological needs propose models where the goals stretch beyond the mere physical survival and extend to exploring and controlling the environment, social relationships, and self-esteem. Most of all, these needs do not lead to reactive and protective behavior, but to proactive, explorative, and growth-oriented behavior (Deci and Ryan 2000). According to this perspective, humans are not passively reacting to homeostasis perturbation; instead they are actively engaged in activities that stimulate their interest.

Partly related to the survival versus well-being goal orientation, another characteristic of theories concerns the *source* of the drive: whether it is genetically coded and innate (Deci and Ryan 2000), or learned (Murray 1938). The focus on innate drives interprets needs as a necessary force that shapes human behavior toward effective functioning and flourishing. If the person does not meet the proper environmental inputs to satisfy these innate needs, her survival will be threatened or (for well-being oriented models) she will not reach a proper level of psychological health. On the other hand, the focus on learned needs stresses the social and cultural influence on the quality, degree, and order in which needs are satisfied.

Needs theories can vary according to the *level of analysis*, since we can frame needs ranging from the biological, to the individual, to the social group level. Some theories mainly focus on one of these levels, while others take into account the whole range. The biological level accounts for basic physiological needs (food, water, temperature regulation, oxygen) and psychological needs (fight-or-flight response, conditioning, and basic learning). The individual level is the focus of theories that interpret needs as a fundamental aspect of individual functioning, and that can be understood also in the absence of social interactions (e.g., self-esteem). At the social level, on the other hand, needs are interpreted as individual processes that depend and are oriented toward the social environment; at this level, the social group is essential for such needs to operate (e.g., belonging, attachment, etc.).

Taking into account the *conceptual structure* of models about psychological needs, the relationship among needs can vary to a wide extent. The most famous hierarchical model is Maslow's (1943) pyramid of needs. In it, needs are organized along five levels, ranging from physiological needs to self-actualization. A different form of hierarchy can be seen in models with a root need structure. An example of such a model is the Terror Management Theory (Pyszczynski, Greenberg and Solomon 1997), where self-preservation is the root need from which other needs stem, such as the biological motives, the expansion desire, and the symbolic-defensive need to distract or comfort from the mortality salience. Finally, we have structures where the needs are listed as a set of independent factors. One of the most relevant theories is the Self-Determination Theory (SDT) proposed by Deci and Ryan (2000), where autonomy, competence, and relatedness are seen as the three main needs necessary for thriving and each of them is important for the accomplishment of mental health and well-being.

Another aspect that strongly differentiates theories is the *number* of needs they take into account. They range from one (e.g., attachment) to at least twenty (Murray 1938). The number depends on the structural model of the theory, and on the level of detail it aims to reach.

Baumeister and Leary (1995) propose an interesting contribution to conclude if a construct is a fundamental human need. A fundamental motivation should:

1. Readily produce effects under all but adverse conditions: a fundamental motivation should function in a wide variety of circumstances.

2. Have affective consequences: basic motivation is built on the elicitation of hedonic consequences concerning a situation or a course of actions.
3. Direct cognitive processing: motivation affects the evaluation of subjective importance of a situation.
4. Lead to ill effects when thwarted: when a need is neglected, its effects will be beyond the temporary distress and should lead to pathology (medical, psychological, or behavioral).
5. Elicit goal-oriented behavior designed to satisfy it: when a need is satisfied, the behavior that led to this state will cease (satiation), and when a situation does not satisfy a need anymore, the behavior will be oriented toward something else (substitution).
6. Be universal in the sense of applying to all people: basic needs transcend cultural and historical boundaries.
7. Not be derivative of other motives: basic needs show a clear evolutionary pattern, imply physiological mechanisms that are broadly universal and innate.
8. Affect a broad variety of behaviors: the fundamental needs can influence a broad and diverse set of behaviors.
9. Have implications that go beyond immediate psychological functioning: fundamental needs show influence on a wide range of human activity, their effects go beyond the personal well-being and can be traced in historical, economic, or social phenomena.

Development of the Concept

The concept of need has been widely adopted in the history of psychology to describe the content of motivation and the source, energy, and direction of behavior. Two traditions can be traced in the investigation of the concept. One was more focused on explaining behavior as the result of basic drives that push toward the satisfaction of physiological needs. When the drive states are reduced, learning occurs, linking the satisfactory behavior to the drive decrease (Hull 1943). The same dynamics is at the core of the behaviorist approach to needs, represented as a set of innate drives which are the ground for secondary drives that are learned via simple conditioning principles. An alternative approach to human needs focused on kinds of behavior that cannot be explained in terms of homeostatic processes, like play, exploration, and intrinsic motivation. The most relevant representative of this approach was Murray (1938). He listed more than 20 needs that could be categorized in clusters such as: dominance, achievement, sensual enjoyment, affiliation, nurture, self-regulation, safety, order, and understanding (Pittman and Zeigler 2007).

This distinction between needs as homeostasis and needs as protection and growth slowly faded after the advent of the cognitivist paradigm, when the concept of need was partly replaced by the notion of goal and the focus shifted from the content of the goal to the process itself.

Current Trends

Several theories and models have been proposed (for a review, see Pittman and Zeigler 2007). Here we present three theories as an example of the wide range of approaches framed according to the criteria listed in the first paragraph.

Maslow Revisited

The hierarchical model proposed by Maslow (1943) had an enormous impact on psychology and its derivate applications in social contexts, organizations, research on personality, psychopathology, etc. Notwithstanding its fame, the model has often been considered for its generic communicative value, rather than for its theoretical soundness and empirical evidence. Kenrick et al. (2010) have proposed an attempt to renovate the Maslow's concept within the frame of evolutionary theory. The authors tried to explicitly address one of the main issues of Maslow's model: i.e., the incoherence between the idea of a hierarchy and the observation of violations in this order in many human behaviors (e.g., where self-actualization ideals can be strong enough to thwart survival needs). Kenrick et al. (2010) propose a model

with three hierarchical organizations that can be independent: the developmental order (the sequence with which needs occur during the ontogenesis); the cognitive priority (the preference for some needs over others, independently from their hierarchy); and the evolutionary function (from survival to parenting). The model presents a set of superimposed concentric triangles, from the largest to the smallest, in this order: immediate physiological needs, self-protection, affection, self-esteem, mate acquisition, mate retention, and parenting. Rather than being a pyramid, the model presents the later developing goal systems as overlapping with the earlier systems, meaning that they can always be activated, once developed, if relevant environmental cues are present.

Terror Management Theory

According to the Terror Management Theory (Pyszczynski et al. 1997), the human root need is self-preservation or survival. This need is threatened by the evidence of mortality and this can create an existential crisis, probably an exclusive characteristic of human beings, since we are aware of our decay. Upon the self-preservation need, three sets of motives develop: direct motives (need for food, water, etc.); defensive motives to protect ourselves from the fear of death (e.g., pursuit of self-esteem); and self-expansive motives (growth, exploration, etc.). Human motivation and behavior can be framed within this tension between expansion and protection.

Self-Determination Theory

More than 30 years of research has provided consistent evidence to the Self-Determination Theory (SDT) by Deci and Ryan (2000). The authors claim that our motives are driven by three basic innate needs: autonomy, competence, and relatedness. All three needs are independent and have to be satisfied to provide optimal functioning, no matter the order of satisfaction. The need for autonomy is the expression of self-regulation, since human beings need to engage in activities where they explore and manifest their agency. The need for competence is satisfied when we have an effective interaction with the environment and we perceive the pleasure of achieving a good result. The need for relatedness is satisfied when we feel the connection, protection, and appreciation of others, from caregivers to the community. The basic postulate of this theory is that "humans are active, growth-oriented organisms who are naturally inclined toward integration of their psychic elements into a unified sense of self and integration of themselves into larger social structures" (Deci and Ryan 2000, p. 229). Just as a plant needs nutrients from its soil, we need ambient support in order for relatedness, autonomy, and competence to flourish. When thwarted by negative conditions, we could develop alternative, defensive reactions such as self-focusing, social withdrawal, or even antisocial activities.

Psychological Needs and Well-Being

Bringing further evidence to the SDT, Tay and Diener (2011), with a study involving 123 countries, support the hypothesis of the universality of needs and their substantial independence from each other in the effects on subjective well-being. They also observe that needs tend to be achieved in a certain order, even though the order variation does not affect the overall well-being. Humans can find happiness working on the needs over which they have more control. The socioeconomic environment plays a great role in fulfilling basic safety needs, while individual factors are determinant for the achievement of psychosocial needs.

In a similar study, Sheldon et al. (2001) compared ten candidate needs for their relative contribution to life satisfaction in both western and eastern countries. As predicted by SDT, autonomy, relatedness, and competence, together with self-esteem, were highly associated with event-related affect. Self-actualization, physical thriving, popularity, and money were rated as less important.

Conclusions

This recent evidence should provide useful and fertile stimuli for authorities and social planners to

nurture the roots of our well-being and promote our growth. As already stated by Maslow (1943), needs are like vitamins: they are all important for our health and we need them in a proper balance. We cannot indulge in one to counterbalance the lack of another. But, most importantly, we need them all.

Cross-References

- Achievement (Need for)
- Attachment Theory
- Deficiency Motive
- Desire
- Drive Theory
- Entry for Need for Closure
- Esteem Needs
- Growth Needs
- Motives
- Need for Achievement
- Need for Affiliation
- Need for Autonomy, The
- Need for Cognition
- Need for Competence, The
- Self-Actualization Needs
- Self-Esteem and Belongingness
- Self-Esteem and Security
- Social Goals
- Terror Management Theory

References

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497–529.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268.

Hull, C. L. (1943). *Principles of behavior: An introduction to behavior theory.* New York: Appleton-Century-Crofts.

Kenrick, D. T., Griskevicius, V., Neuberg, S. L., & Schaller, M. (2010). Renovating the pramid of needs: Contemporary extensions built upon ancient foundations. *Psycholgical Sciences, 5*(3), 293–314.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*, 370–396.

Murray, H. A. (1938). *Explorations in personality.* New York: Oxford University Press.

Pittman, T. S., & Zeigler, K. R. (2007). Basic human needs. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social psychology. Handbook of basic principles*. New York: Guilford Press.

Pyszczynski, T., Greenberg, J., & Solomon, S. (1997). Why do we need what we need? A terror management perspective on the roots of human social motivation. *Psychological Inquiry, 8*, 1–20.

Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology, 80*(2), 325–339.

Tay, L., & Diener, E. (2011). Needs and subjective well-being around the world. *Journal of Personality and Social Psychology, 101*(2), 354–365.

Neff, Kristin D.

Kristin D. Neff
Department of Educational Psychology, The University of Texas at Austin, Austin, TX, USA

Kristin D. Neff is an Associate Professor in the Educational Psychology Department of the University of Texas at Austin. She is a developmental psychologist who studies the mental health benefits of self-compassion. Neff is also featured in the bestselling book and award-winning documentary *The Horse Boy*, which chronicles her family's journey to Mongolia where they trekked on horseback to find healing for her autistic son.

Early Life and Educational Background

Neff studied communications as an undergraduate at the University of California at Los Angeles (B.A., 1988). She did her graduate work at University of California at Berkeley (Ph.D., 1997), studying moral development with Dr. Elliot Turiel. Her dissertation research was conducted in Mysore, India, where she examined children's, adolescents', and adults' moral reasoning about interpersonal conflict situations. She then spent 2 years of postdoctoral study with Dr. Susan Harter at Denver University, studying issues of

authenticity and self-concept development. During Kristin's last year of graduate school in 1997, she became interested in Buddhism and has been practicing meditation in the Insight Meditation tradition ever since.

Professional Career

Neff's current position at the University of Texas at Austin started in 1999, and she was promoted to Associate Professor in 2006. She serves as an Associate Editor for the journal *Mindfulness* and is on the editorial board of *Self and Identity*. She is president of the Board for the Center for Mindful Self-Compassion and also serves as an Advisory Board Member for the Consciousness, Mindfulness, Compassion International Association, the University of California at San Diego Mindfulness-Based Training Institute, the Compassionate Mind Foundation, and the Foundation for Self Leadership.

Research Interests

While doing her postdoctoral work, Neff decided to conduct research on self-compassion, a central construct in Buddhist psychology and one that had not yet been examined empirically. She was the first to operationally define and measure self-compassion, publishing one paper presenting the construct and another presenting the Self-Compassion Scale in 2003. She has since authored over 40 academic articles and book chapters on the topic of self-compassion. As of June 2016, Google Scholar reported almost 7,500 citations to Dr. Neff's scholarly publications, with an overall h-index of 29.

In addition to her academic work, Kristin is author of the bestselling trade book titled *Self-Compassion*: *The Proven Power of Being Kind to Yourself* released by William Morrow in 2011. The book has since been translated into over 14 languages. Kristin's work has received extensive media coverage, including the *New York Times*, *MSNBC*, *National Public Radio*, *Scientific American*, and *Psychology Today*. In conjunction with her colleague, Dr. Christopher Germer, she has developed an empirically supported 8-week training program called Mindful Self-Compassion (see www.CenterforMSC.org) and offers workshops on self-compassion worldwide. Information on self-compassion – including videos, guided meditations, exercises, research articles, and the Self-Compassion Scale – is available at www.self-compassion.org.

Selected Bibliography

Neff, K. D. (2003a). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity, 2*, 85–102.

Neff, K. D. (2003b). Development and validation of a scale to measure self-compassion. *Self and Identity, 2*, 223–250.

Neff, K. D., & Germer, C. K. (2013). A pilot study and randomized controlled trial of the mindful self-compassion program. *Journal of Clinical Psychology, 69*(1), 28–44.

Neff, K. D., & Vonk, R. (2009). Self-compassion versus global self-esteem: Two different ways of relating to oneself. *Journal of Personality, 77*, 23–50.

Neff, K. D., Kirkpatrick, K., & Rude, S. S. (2007). Self-compassion and its link to adaptive psychological functioning. *Journal of Research in Personality, 41*, 139–154.

Negative Affect

Cornelia Wrzus[1] and Gloria Luong[2]
[1]Psychological Institute, Johannes Gutenberg University Mainz, Mainz, Germany
[2]Colorado State University, Fort Collins, CO, USA

Synonyms

Unpleasant affect

Definition

Negative affect generally describes different momentary affective phenomena of unpleasant

valence varying in object-relatedness and temporal resolution: from briefly fluctuating emotions after specific events to long-lasting moods without a clear cause. At the same time, people differ reliably and rather stably in their inclination to experience momentary negative affect. This entry examines negative affect from the personality perspective, i.e., as relatively enduring differences between individuals to experience various types of negative affect. Another topic entry in this *Encyclopedia of Personality and Individual Differences* focuses on positive affect.

Introduction: Trait-State Distinction

The latent state-trait theory (LST theory, Steyer et al. 1999) formalizes the distinction between momentary affective experiences that last seconds to a few minutes or hours (i.e., states) and relatively stable differences between people, usually regarding the average intensity and/or frequency to experience negative affect (i.e., traits). LST theory assumes that individuals' traits systematically affect their momentary psychological states together with situational influences and personality-situation interactions. Repeated state assessments allow distinguishing trait and state (and interactional) variance components in state experiences through LST analysis (Edmondson et al. 2013). Several empirical articles confirm the usefulness of LST theory and analyses for negative affect and affect in general (Edmondson et al. 2013; Eid and Diener 1999).

Over time and between individuals, negative affect states vary in their intensity and frequency (Eid and Diener 1999). As outlined in the LST theory, negative affect is theoretically (Carver 2001) and empirically (see next sections) closely linked to unpleasant situations that elicit negative affect. Trait negative affect, and neuroticism in general, predicts whether and how strong the affective reaction to the situation occurs (Suls and Martin 2005).

In addition to intensity and frequency, negative affect states differ in the level of arousal; for example, *depressed* possesses a relatively low arousal level and *angry* possesses a relatively high arousal level (Carver 2001). High arousal negative affect can be distinguished further into fight-or-flight responses (e.g., *angry* or *anxious*). These three different negative affective states have corresponding phenomena on the trait level, explained next.

Depressivity

Depressivity refers to individual differences in subclinical levels of symptoms typically associated with depression: dysphoria, listlessness, loss of interest, and reduced activity. More pronounced depressivity predicts higher average negative affect and more pronounced affective reactivity in daily life (i.e., increases in negative affect after unpleasant events and decreases in negative affect after pleasant events, Nezlek and Plesko 2003).

Greater affective reactivity to events suggests that depressivity is also related to greater affect variability or instability. Many studies assess intraindividual variability using the within-person standard deviation of negative affect across multiple measurement occasions (Eid and Diener 1999). Other indicators take the temporal dynamics of variation in negative affect into account and tested them in clinical samples (e.g., mean squared successive differences MSSD; Jahng et al. 2008). Finally, depressivity as a trait not only predicts negative affect in daily life, but negative affect and affective reactivity in daily life also predict future depressivity and depressive disorder (Charles et al. 2013).

Anxiety

Anxiety as a personality characteristic describes the lasting tendency to feel nervous, fearful, and worried (Edmondson et al. 2013). Although anxiety and depressivity are often co-occurring, anxiety differs from depressivity because the underlying negative affective states possess a higher level of arousal, potentially facilitating

avoidance tendencies (i.e., flight responses; Carver 2001). The state-trait anxiety inventory, STAI, measures state and trait components of anxiety and finds wide usage in the clinical context because it reliably measures heightened levels of anxiety relevant for different clinical disorders (e.g., Oei et al. 1990).

Since self-reports possess limitations concerning answering biases and observability of reported feelings and behavior, recent research focuses on measuring anxiety indirectly, for example, with implicit tests (Egloff and Schmukle 2002). The studies showed that explicit and implicit measures hardly overlap and that implicitly measured anxiety can predict behavioral indicators of anxiety and performance decrements during a threatening situation more strongly than explicit anxiety, for example, measured with the STAI.

Anger

Anger describes feelings of negative valence and heightened arousal, which can fulfill the function of eliciting approach behavior to overcome an obstacle, for example, engage in fight behavior during a conflict (Carver 2001). As such, anger differs from anxiety as further negative, high arousal state regarding the behavioral consequences (i.e., fight or flight). Trait anger, or hostility, describes the individual differences in the frequency and intensity to feel anger (Edmondson et al. 2013). Aggressiveness partly overlaps with hostility or anger, but focuses more strongly on different kinds of aggressive behavior (e.g., physical vs. verbal, proactive vs. reactive), its antecedents and consequences (Krahé 2013).

Recent studies showed that individual differences in trait anger moderate the response to provoking situations or stimuli during both the perception and the reaction to the event. For example, people higher in trait anger perceived neutral faces more strongly as angry (Penton-Voak et al. 2013) and were faster in approaching angry faces on computer screens (Veenstra et al. 2016) compared to people lower in trait anger.

Associations with Big Five Traits

The previous sections addressed how specific personality characteristics relate to distinct negative affective experiences. The Big Five trait *neuroticism* relates to negative affect in general, whereas small to negligible associations with the other Big Five traits exist. With greater neuroticism, individuals report in daily life and in controlled laboratory situations more intense negative affect, more frequent negative affect, greater increases in negative affect after unpleasant situations (Suls and Martin 2005), and, presumably partly as a result of the previous phenomena, greater negative affect variability (Eid and Diener 1999).

Associations between generalized self-representations of neuroticism, as measured with questionnaires, and repeated momentary affective states are far from trivial because they validate the basic assumption of LST outlined in the beginning: Affective traits, such as neuroticism, systematically affect individuals' momentary affective experiences together with situational influences and personality-situation interactions. In addition, self-reports of generalized affect experiences do not represent simple aggregates of experienced affect because generalized reports may be influenced through under- and over-estimation of the frequency and/or intensity of negative affect (Robinson and Clore 2002). Thus, neuroticism can be seen as an overarching personality trait linked to various kinds of negative affect. If facets of traits are distinguished, depression, anxiety, and angry hostility represent subscales of neuroticism.

Conclusion

Negative affect comprises of various aspects, including depressivity, anxiety, and anger, which share the unpleasant valence but differ in arousal levels and approach vs. avoidance tendencies (i.e., fight-or-flight responses). Moreover, consistent links between negative affect and the Big Five trait neuroticism exist. In conclusion, this entry shows that from a personality perspective

negative affect represents rather stable individual differences in the intensity, frequency, and variability of experiencing various negative affective states.

Cross-References

- ▶ Aggression
- ▶ Negative Affectivity
- ▶ Neuroticism
- ▶ Positive Affect

References

Carver, C. S. (2001). Affect and the functional bases of behavior: On the dimensional structure of affective experience. *Personality & Social Psychology Review, 5*, 345–356.

Charles, S. T., Piazza, J. R., Mogle, J., Sliwinski, M. J., & Almeida, D. M. (2013). The wear and tear of daily stressors on mental health. *Psychological Science, 24*, 733–741. https://doi.org/10.1177/0956797612462222.

Edmondson, D., Shaffer, J. A., Chaplin, W. F., Burg, M. M., Stone, A. A., & Schwartz, J. E. (2013). Trait anxiety and trait anger measured by ecological momentary assessment and their correspondence with traditional trait questionnaires. *Journal of Research in Personality, 47*, 843–852. https://doi.org/10.1016/j.jrp.2013.08.005.

Egloff, B., & Schmukle, S. C. (2002). Predictive validity of an implicit association test for assessing anxiety. *Journal of Personality and Social Psychology, 83*, 1441–1455. https://doi.org/10.1037/0022-3514.83.6.1441.

Eid, M., & Diener, E. (1999). Intraindividual variability in affect: Reliability, validity, and personality correlates. *Journal of Personality and Social Psychology, 76*, 662–676.

Jahng, S., Wood, P. K., & Trull, T. J. (2008). Analysis of affective instability in ecological momentary assessment: Indices using successive difference and group comparison via multilevel modeling. *Psychological Methods, 13*, 354–375.

Krahé, B. (2013). *The social psychology of aggression*. East Sussex: Psychology Press.

Nezlek, J. B., & Plesko, R. M. (2003). Affect- and self-based models of relationships between daily events and daily well-being. *Personality and Social Psychology Bulletin, 29*, 584–596.

Oei, T. P. S., Evans, L., & Crook, G. M. (1990). Utility and validity of the STAI with anxiety disorder patients. *British Journal of Clinical Psychology, 29*, 429–432. https://doi.org/10.1111/j.2044-8260.1990.tb00906.x.

Penton-Voak, I. S., Thomas, J., Gage, S. H., McMurran, M., McDonald, S., & Munafò, M. R. (2013). Increasing recognition of happiness in ambiguous facial expressions reduces anger and aggressive behavior. *Psychological Science, 24*, 688–697. https://doi.org/10.1177/0956797612459657.

Robinson, M. D., & Clore, G. L. (2002). Belief and feeling: Evidence for an accessibility model of emotional self-report. *Psychological Bulletin, 128*, 934–960.

Steyer, R., Schmitt, M., & Eid, M. (1999). Latent state–trait theory and research in personality and individual differences. *European Journal of Personality, 13*, 389–408.

Suls, J., & Martin, R. (2005). The daily life of the garden-variety neurotic: Reactivity, stressor exposure, mood spillover, and maladaptive coping. *Journal of Personality, 73*, 1485–1509. https://doi.org/10.1111/j.1467-6494.2005.00356.x.

Veenstra, L., Schneider, I. K., Bushman, B. J., & Koole, S. L. (2016). Drawn to danger: Trait anger predicts automatic approach behaviour to angry faces. *Cognition and Emotion*, p. 1–7. https://doi.org/10.1080/02699931.2016.1150256.

Negative Affectivity

Daniel J. Paulus[1] and Michael J. Zvolensky[1,2]
[1]Department of Psychology, University of Houston, Houston, TX, USA
[2]Department of Behavioral Science, The University of Texas MD Anderson Cancer Center, Houston, TX, USA

Synonyms

Negative affect; Negative mood; Neuroticism; Stress; Temperament

Definition

The disposition to experience aversive emotional states (Watson and Clark 1984).

Introduction

Negative affectivity is a stable and inherited disposition to experience nonspecific distress or unpleasant emotions (Clark et al. 1994). It is

considered by some to be synonymous with the personality factor of neuroticism, which corresponds to individuals' tendency to experience negative affect states (Costa and McCrae 1980; Watson et al. 1988a). Watson and Clark (1984) proposed that negative affectivity encompasses a range of constructs including trait anxiety, neuroticism, ego strength, and maladjustment, among others. Negative affectivity is considered a general risk factor for a range of health and mental health problems, which frequently co-occur. For example, someone experiencing one negative mood state (e.g., sadness) is likely to report greater levels of other negative mood states such as fear or anger (Watson and Naragon-Gainey 2010). This entry will briefly introduce research centered on negative affectivity as it relates to mental health problems. We conclude with a discussion of future directions for the study of negative affectivity.

Structure and Measurement of Negative Affectivity

One of the most widely used measures of negative affectivity is the positive and negative affect schedule (PANAS; Watson et al. 1988a). The PANAS is a 20-item self-report measure including two subscales – positive and negative affectivity, respectively. Each item on the PANAS includes an emotion (e.g., upset, ashamed) and is rated as to how the individual feels in general on a Likert scale and the ten negative affectivity items are summed together. Importantly, positive and negative affectivity were designed to be independent of one another (i.e., such that low negative affectivity does not necessarily indicate high positive affectivity) rather than opposite ends of an affective continuum (Watson et al. 1988a). In fact convergent lines of work support the independence of the positive and negative affectivity subscales (Rush and Hofer 2014). The PANAS has demonstrated good psychometric properties over a range of populations and developmental age ranges. For example, it has been shown to yield consistency across various demographic factors (Crawford and Henry 2004). Moreover, the PANAS been found to demonstrate psychometrically sound properties among specific racial/ethnic groups (e.g., African Americans; Merz et al. 2013) and has been translated and used successfully in numerous languages and populations (e.g., Latinos in primary care; Zvolensky et al. 2016).

Although primarily used among adults and general samples, the PANAS has been tested among older adult populations as well (Kercher 1992). Further, the PANAS has also been modified and validated for use among children (PANAS-C; Laurent et al. 1999; Wilson et al. 1998) demonstrating good reliability of items, strong correlations with measures of related constructs (i.e., neuroticism), and weak/nonsignificant correlations with measures of theoretically opposing constructs (i.e., positive affectivity). Among children and adolescents, the measure may tap into more specific negative moods (i.e., fear/distress or anxiety/depression), whereas for older ages it assesses more general negative affectivity. It is possible that this is a measurement issue of the PANAS-C or that the construct of negative affectivity develops over childhood/adolescence and becomes more stable over time. Accompanying the PANAS-C is also the parent-report PANAS-C (PANAS-C-P; Ebesutani et al. 2011), which has been empirically validated and provides converging evidence for the child self-report.

Stability

Negative affectivity is relatively stable over time (Watson et al. 1988a), with research showing stability in self-reported negative affectivity for periods of 2 months to 7 years (Watson et al. 1988a; Watson and Walker 1996). As such, those with high negative affectivity are likely to report more negative mood states over time. As alluded to earlier with regard to measurement, negative affectivity has been documented in samples across the life span. In one longitudinal study of children from 4th to 11th grade, modeling of self-report measures found a moderately stable temperamental factor of negative affectivity

(Lonigan et al. 2003), supporting negative affectivity as a temperamental factor among youth.

Despite this overall stability, there is some degree variability in negative affectivity, deemed to be "modest" overall (Watson 2000). For example, an ecological momentary assessment study of negative affectivity found that there was variability in negative affectivity (Merz and Roesch 2011). In this study, factors such as stress were found to impact variability negative affectivity over time. Thus, while negative affectivity is generally consistent over time, there are within-person fluctuations, which can be impacted by environmental and state-level factors.

Research on aging has found a nonlinear relationship with negative affectivity and age, such that negative affectivity increases over time into adulthood (e.g., 30s) followed by a slow decline into older adulthood (e.g., 70s) and a subsequent increase thereafter (Teachman 2006). Further, within-person ratings of negative affectivity have been shown to be more variable among younger adults relative to older adults, potentially indicating increased stability over time (Röcke et al. 2009). This approach has been supported by other works among children/adolescents finding that negative affectivity may be more differentiated at younger ages (Allan et al. 2015). Taken together, negative affectivity is *relatively* stable with individuals reporting overall greater levels of negative mood across situations, but there is important variation both within the individual and over time that can offer meaningful information. More work is needed to identify factors impacting change of negative affectivity over time.

Negative Affectivity and Psychological Disorders

Negative affectivity is conceptualized as a "general" risk factor for psychopathology. As a trait, negative affectivity is considered a broad predisposition to experience negative emotions such as anxiety, fear, and sadness (Watson et al. 1988b). Indeed, negative affectivity is associated with a range of psychopathology, including eating disorders (Cook et al. 2014; Stice 2002), substance use disorders (Cook et al. 2014), schizophrenia-spectrum disorders (Blanchard et al. 1998), personality disorders (Zeigler-Hill and Abraham 2006), and a variety of health concerns (Watson and Naragon-Gainey 2014). Additionally, negative affectivity is theorized to play an etiological role accounting for the overlap in negative emotional disorders of anxiety and depression (Clark and Watson 1991). Further, negative affect was identified as one of five "core elements" of personality along with detachment, antagonism, disinhibition, and psychoticism (Krueger et al. 2012), emphasizing the role of negative affectivity not only in personality *disorders* but also personality at a broader level. Notably, negative affectivity is theorized to be a preexisting temperamental disposition, occurring prior to the onset of specific pathology. Prospective studies have found negative affectivity to predict later onset of a range of problems including mental health, hypertension, and substance abuse (Craske et al. 2001; Jonas and Lando 2000; Measelle et al. 2006; Pine et al. 1998). Overall, available works suggest negative affectivity is a consistent marker of distress across a range of presenting problems and appears to play an etiological role in their onset.

Despite the body of work demonstrating strong relations between negative affectivity and various forms of distress, research has consistently found that not all negative affectivity associations are equal (Kotov et al. 2010; Mineka et al. 1998; Paulus et al. 2015; Watson 2009). That is, although negative affectivity is a general distress marker common to various disorders, the degree to which negative affectivity impacts specific problems is not of the same magnitude. Of all the problems linked to negative affectivity, some of the strongest evidence is for links of negative affectivity to anxiety and depressive disorders (dubbed "negative affect syndrome"; Barlow et al. 2004; for review, see Norton and Paulus 2015). Yet, negative affectivity has been found to relate more strongly to depression directly relative to other problems, such as panic disorder (Paulus et al. 2015). These findings are consistent with integrative models of affective vulnerability suggesting that negative affectivity by itself is not

likely to lead to clinical disorders. Rather, negative affectivity may interact with and/or operate through a number of more specific psychological factors or environmental experiences to then confer risk for specific types of conditions (Barlow 2004; Chorpita and Barlow 1998). Indeed, negative affectivity is considered by many to be a higher-order trait variable associated with various forms of negative emotions and distress (Keogh and Reidy 2000), explaining only a portion of the expression of specific problems, such as anxiety and depression (Simms et al. 2008). Barlow's (2004) triple vulnerability model of anxiety and depression outlined the importance of genetic contributions, general psychological risk factors (such as negative affectivity) and disorder-specific, or even semi-specific (Taylor 1998) or transdiagnostic (i.e., relating to more than one diagnostic category; Norton and Paulus 2015), factors in the development of psychopathology. This work highlights the importance of identifying mechanisms by which negative affectivity transmits risk to certain problems. In addition to mechanisms, there may be certain factors that exacerbate risk. As such, some have proposed that lower levels of positive affectivity in conjunction with high levels of negative affectivity may confer specific risk for certain disorders (e.g., depression, social anxiety, and schizophrenia-spectrum disorders; Watson and Naragon-Gainey 2010).

In line with this work, several hierarchical models of negative affectivity have been developed, with emphasis on anxiety, depression, and their disorders. One research group (Norton and Mehta 2007; Norton et al. 2005; Paulus et al. 2015; Sexton et al. 2003) has investigated "semi-specific" or "mid-level" transdiagnostic factors of anxiety sensitivity (i.e., fear of arousal-related sensations) and intolerance of uncertainty (i.e., fear of the unknown), which may explain how the "higher-order" or general risk factor of negative affectivity manifests into specific disorders (e.g., depression, panic disorder, obsessive compulsive disorder). Interestingly, findings of these hierarchical models are consistent with a two-factor model of anxiety/depressive disorders consisting of anxious-misery and fear (e.g., Krueger 1999; Krueger and Markon 2006; Prenoveau et al. 2010; Slade and Watson 2006; Watson 2005; Watson et al. 2008; Wright et al. 2013) with anxiety sensitivity linking more strongly to fear disorders (e.g., panic disorder) and intolerance of uncertainty linking more strongly to anxious-misery disorders (e.g., generalized anxiety disorder). Models such as these are encouraging but will need to be expanded to explore a wider range of psychological problems. Future work will need to further develop these hierarchical models to identify specific pathways by which negative affectivity may manifest into anxiety/depression as well as other forms of psychopathology. As such, it will be important to expand current models to include multiple transdiagnostic "mid-level" factors such as emotion regulation and distress tolerance, as well as diagnosis-specific factors that may explain how negative affectivity operates in unique problem domains.

Clinical Impact of Negative Affectivity

Building off of the extensive work identifying negative affectivity, treatment developers have been working toward translating the psychopathological model of negative affectivity into psychological interventions. One prominent example includes the Unified Protocol for Emotional Disorders (Barlow et al. 2011), which is a treatment developed for anxiety and depressive diagnoses (including post-traumatic stress disorder and obsessive compulsive disorder). This treatment was built off of Barlow et al. (2004) notion of anxiety and depression as negative affect syndromes and suggestions that negative affectivity, while relatively stable, may be malleable (Brown 2007). As such, reduction of negative affectivity is one of the primary aims of the treatment, accomplished via focus on affective processing. Initial clinical outcome data found that the treatment was effective in reducing negative affectivity after 8–15 one-hour sessions (Ellard et al. 2010), findings evident in a subsequent larger randomized trial with 67% of individuals ending up in the "normative range" of negative affectivity following treatment (Farchione et al.

2012). Building from these findings, others have evaluated negative affectivity as a mediator of treatment outcome in transdiagnostic treatment (Talkovsky and Norton 2014). Talkovsky and Norton (2014) found that reductions in negative affectivity over the course of treatment accounted for the reduction in anxiety outcomes, demonstrating that change in negative affectivity may be a primary mechanism of action in treatment. Importantly, other competing mechanisms (anxiety sensitivity and intolerance of uncertainty) were also tested as mechanisms of change and did not account for outcomes. Future work will need to evaluate whether such focus on negative affectivity in treatment is effective for other outcomes and problems.

Conclusion

Overall, negative affectivity is a broad risk factor for a range of mental health problems. Research suggests that it is malleable and responsive to psychosocial intervention and that reductions in negative affectivity are associated with reductions in specific presenting symptoms. Future work will need to examine interventions in a wider range of problems as well as to examine the longevity of reduction via long-term outcomes. Such approaches will require large, diverse samples, and longitudinal designs.

Cross-References

- ▶ Negative Affect
- ▶ Neuroticism
- ▶ Positive and Negative Affect Schedule (PANAS)
- ▶ Trait Anxiety
- ▶ Type D Personality

References

Allan, N. P., Lonigan, C. J., & Phillips, B. M. (2015). Examining the factor structure and structural invariance of the PANAS across children, adolescents, and young adults. *Journal of Personality Assessment, 97*(6), 616–625. http://doi.org/10.1080/00223891.2015.1038388.

Barlow, D. H. (2004). *Anxiety and its disorders: The nature and treatment of anxiety and panic*. New York: Guilford Press.

Barlow, D. H., Allen, L. B., & Choate, M. L. (2004). Toward a unified treatment for emotional disorders. *Behavior Therapy, 35*(2), 205–230. http://doi.org/10.1016/S0005-7894(04)80036-4.

Barlow, D. H., Farchione, T. J., Fairholme, C. P., Ellard, K. K., Boisseau, C. L., Allen, L. B., & Ehrenreich-May, J. T. (2011). *Unified protocol for transdiagnostic treatment of emotional disorders: Therapist guide*. New York: Oxford University Press.

Blanchard, J. J., Mueser, K. T., & Bellack, A. S. (1998). Anhedonia, positive and negative affect, and social functioning in schizophrenia. *Schizophrenia Bulletin, 24*(3), 413–424.

Brown, T. A. (2007). Temporal course and structural relationships among dimensions of temperament and DSM-IV anxiety and mood disorder constructs. *Journal of Abnormal Psychology, 116*(2), 313.

Chorpita, B. F., & Barlow, D. H. (1998). The development of anxiety: The role of control in the early environment. *Psychological Bulletin, 124*(1), 3–21. http://doi.org/10.1037/0033-2909.124.1.3.

Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology, 100*(3), 316–336. http://doi.org/10.1037/0021-843X.100.3.316.

Clark, L. A., Watson, D., & Mineka, S. (1994). Temperament, personality, and the mood and anxiety disorders. *Journal of Abnormal Psychology, 103*(1), 103–116. http://doi.org/10.1037/0021-843X.103.1.103.

Cook, B. J., Wonderlich, S. A., & Lavender, J. M. (2014). The role of negative affect in eating disorders and substance use disorders. In T. D. Brewerton & A. B. Dennis (Eds.), *Eating disorders, addictions and substance use disorders* (pp. 363–378). Berlin: Springer. Retrieved from http://link.springer.com/chapter/10.1007/978-3-642-45378-6_16.

Costa, P. T., & McCrae, R. R. (1980). Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people. *Journal of Personality and Social Psychology, 38*(4), 668–678. http://doi.org/10.1037/0022-3514.38.4.668.

Craske, M. G., Poulton, R., Tsao, J. C., & Plotkin, D. (2001). Paths to panic disorder/agoraphobia: An exploratory analysis from age 3 to 21 in an unselected birth cohort. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*(5), 556–563. http://doi.org/10.1097/00004583-200105000-00015.

Crawford, J. R., & Henry, J. D. (2004). The positive and negative affect schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 43*(3), 245–265. http://doi.org/10.1348/0144665031752934.

Ebesutani, C., Okamura, K., Higa-McMillan, C., & Chorpita, B. F. (2011). A psychometric analysis of the positive and negative affect schedule for children–parent version in a school sample. *Psychological Assessment, 23*(2), 406–416. http://doi.org/10.1037/a0022057.

Ellard, K. K., Fairholme, C. P., Boisseau, C. L., Farchione, T. J., & Barlow, D. H. (2010). Unified protocol for the transdiagnostic treatment of emotional disorders: Protocol development and initial outcome data. *Cognitive and Behavioral Practice, 17*(1), 88–101. http://doi.org/10.1016/j.cbpra.2009.06.002.

Farchione, T. J., Fairholme, C. P., Ellard, K. K., Boisseau, C. L., Thompson-Hollands, J., Carl, J. R., et al. (2012). Unified protocol for transdiagnostic treatment of emotional disorders: A randomized controlled trial. *Behavior Therapy, 43*(3), 666–678. http://doi.org/10.1016/j.beth.2012.01.001.

Jonas, B. S., & Lando, J. F. (2000). Negative affect as a prospective risk factor for hypertension. *Psychosomatic Medicine, 62*(2), 188–196. http://doi.org/10.1097/00006842-200003000-00006.

Keogh, E., & Reidy, J. (2000). Exploring the factor structure of the Mood and Anxiety Symptom Questionnaire (MASQ). *Journal of Personality Assessment, 74*(1), 106–125. http://doi.org/10.1207/S15327752JPA7401 08.

Kercher, K. (1992). Assessing subjective well-being in the old-old the PANAS as a measure of orthogonal dimensions of positive and negative affect. *Research on Aging, 14*(2), 131–168. http://doi.org/10.1177/0164027592142001.

Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking "big" personality traits to anxiety, depressive, and substance use disorders: A meta-analysis. *Psychological Bulletin, 136*(5), 768–821. http://doi.org/10.1037/a0020327.

Krueger, R. F. (1999). The structure of common mental disorders. *Archives of General Psychiatry, 56*(10), 921–926. http://doi.org/10.1001/archpsyc.56.10.921.

Krueger, R. F., & Markon, K. E. (2006). Reinterpreting comorbidity: A model-based approach to understanding and classifying psychopathology. *Annual Review of Clinical Psychology, 2*, 111–133. http://doi.org/10.1146/annurev.clinpsy.2.022305.095213.

Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine, 42*(9), 1879–1890. http://doi.org/10.1017/S0033291711002674.

Laurent, J., Catanzaro, S. J., Joiner Jr., T. E., Rudolph, K. D., Potter, K. I., Lambert, S., … Gathright, T. (1999). A measure of positive and negative affect for children: Scale development and preliminary validation. *Psychological Assessment*, *11*(3), 326–338. http://doi.org/10.1037/1040-3590.11.3.326.

Lonigan, C. J., Phillips, B. M., & Hooe, E. S. (2003). Relations of positive and negative affectivity to anxiety and depression in children: Evidence from a latent variable longitudinal study. *Journal of Consulting and Clinical Psychology, 71*(3), 465–481. http://doi.org/10.1037/0022-006X.71.3.465.

Measelle, J. R., Stice, E., & Springer, D. W. (2006). A prospective test of the negative affect model of substance abuse: Moderating effects of social support. *Psychology of Addictive Behaviors, 20*(3), 225–233. http://doi.org/10.1037/0893-164X.20.3.225.

Merz, E. L., & Roesch, S. C. (2011). Modeling trait and state variation using multilevel factor analysis with PANAS daily diary data. *Journal of Research in Personality, 45*(1), 2–9. http://doi.org/10.1016/j.jrp.2010.11.003.

Merz, E. L., Malcarne, V. L., Roesch, S. C., Ko, C. M., Emerson, M., Roma, V. G., & Sadler, G. R. (2013). Psychometric properties of positive and negative affect schedule (PANAS) original and short forms in an African American community sample. *Journal of Affective Disorders, 151*(3), 942–949. http://doi.org/10.1016/j.jad.2013.08.011.

Mineka, S., Watson, D., & Clark, L. A. (1998). Comorbidity of anxiety and unipolar mood disorders. *Annual Review of Psychology, 49*(1), 377–412. http://doi.org/10.1146/annurev.psych.49.1.377.

Norton, P. J., & Mehta, P. D. (2007). Hierarchical model of vulnerabilities for emotional disorders. *Cognitive Behaviour Therapy, 36*(4), 240–254. http://doi.org/10.1080/16506070701628065.

Norton, P. J., & Paulus, D. J. (2015). Toward a unified treatment for emotional disorders: Update on the science and practice. *Behavior Therapy* (Advance online publication). http://doi.org/10.1016/j.beth.2015.07.002.

Norton, P. J., Sexton, K. A., Walker, J. R., & Norton, G. (2005). Hierarchical model of vulnerabilities for anxiety: Replication and extension with a clinical sample. *Cognitive Behaviour Therapy, 34*(1), 50–63. http://doi.org/10.1080/16506070410005401.

Paulus, D. J., Talkovsky, A. M., Heggeness, L. F., & Norton, P. J. (2015). Beyond negative affectivity: A hierarchical model of global and transdiagnostic vulnerabilities for emotional disorders. *Cognitive Behaviour Therapy, 44*(5), 389–405. http://doi.org/10.1080/16506073.2015.1017529.

Pine, D. S., Cohen, P., Gurley, D., Brook, J., & Ma, Y. (1998). The risk for early-adulthood anxiety and depressive disorders in adolescents with anxiety and depressive disorders. *Archives of General Psychiatry, 55*(1), 56–64. http://doi.org/10.1001/archpsyc.55.1.56.

Prenoveau, J. M., Zinbarg, R. E., Craske, M. G., Mineka, S., Griffith, J. W., & Epstein, A. M. (2010). Testing a hierarchical model of anxiety and depression in adolescents: A tri-level model. *Journal of Anxiety Disorders, 24*(3), 334–344. http://doi.org/10.1016/j.janxdis.2010.01.006.

Röcke, C., Li, S.-C., & Smith, J. (2009). Intraindividual variability in positive and negative affect over 45 days: Do older adults fluctuate less than young adults? *Psychology and Aging, 24*(4), 863.

Rush, J., & Hofer, S. M. (2014). Differences in within- and between-person factor structure of positive and negative affect: Analysis of two intensive measurement studies using multilevel structural equation modeling. *Psychological Assessment, 26*(2), 462–473. http://doi.org/10.1037/a0035666.

Sexton, K. A., Norton, P. J., Walker, J. R., & Norton, G. R. (2003). Hierarchical model of generalized and specific vulnerabilities in anxiety. *Cognitive Behaviour Therapy, 32*(2), 82–94. http://doi.org/10.1080/16506070302321.

Simms, L. J., Grös, D. F., Watson, D., & O'Hara, M. W. (2008). Parsing the general and specific components of depression and anxiety with bifactor modeling. *Depression and Anxiety, 25*(7), E34–E46. http://doi.org/10.1002/da.20432.

Slade, T., & Watson, D. (2006). The structure of common DSM-IV and ICD-10 mental disorders in the Australian general population. *Psychological Medicine, 36*(11), 1593–1600. http://doi.org/10.1017/S0033291706008452.

Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin, 128*(5), 825–848. http://doi.org/10.1037/0033-2909.128.5.825.

Talkovsky, A. M., & Norton, P. J. (2014). Mediators of transdiagnostic group cognitive behavior therapy. *Journal of Anxiety Disorders, 28*(8), 919–924. http://doi.org/10.1016/j.janxdis.2014.09.017.

Taylor, S. (1998). The hierarchic structure of fears. *Behaviour Research and Therapy, 36*(2), 205–214. http://doi.org/10.1016/S0005-7967(98)00012-6.

Teachman, B. A. (2006). Aging and negative affect: The rise and fall and rise of anxiety and depression symptoms. *Psychology and Aging, 21*(1), 201–207. http://doi.org/10.1037/0882-7974.21.1.201.

Watson, D. (2000). *Mood and temperament* (Vol. xi). New York: Guilford Press.

Watson, D. (2005). Rethinking the mood and anxiety disorders: A quantitative hierarchical model for DSM-V. *Journal of Abnormal Psychology, 114*(4), 522–536. http://doi.org/10.1037/0021-843X.114.4.522.

Watson, D. (2009). Differentiating the mood and anxiety disorders: A quadripartite model. *Annual Review of Clinical Psychology, 5*, 221–247.

Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin, 96*(3), 465–490. http://doi.org/10.1037/0033-2909.96.3.465.

Watson, D., & Walker, L. M. (1996). The long-term stability and predictive validity of trait measures of affect. *Journal of Personality and Social Psychology, 70*(3), 567–577. http://doi.org/10.1037/0022-3514.70.3.567.

Watson, D., & Naragon-Gainey, K. (2010). On the specificity of positive emotional dysfunction in psychopathology: Evidence from the mood and anxiety disorders and schizophrenia/schizotypy. *Clinical Psychology Review, 30*(7), 839–848. http://doi.org/10.1016/j.cpr.2009.11.002.

Watson, D., & Naragon-Gainey, K. (2014). Personality, emotions, and the emotional disorders. *Clinical Psychological Science, 2*(4), 422–442. http://doi.org/10.1177/2167702614536162.

Watson, D., Clark, L. A., & Tellegen, A. (1988a). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063–1070. http://doi.org/10.1037/0022-3514.54.6.1063.

Watson, D., Clark, L. A., & Carey, G. (1988b). Positive and negative affectivity and their relation to anxiety and depressive disorders. *Journal of Abnormal Psychology, 97*(3), 346 .http://doi.org/10.1037/0021-843X.97.3.346

Watson, D., O'Hara, M. W., & Stuart, S. (2008). Hierarchical structures of affect and psychopathology and their implications for the classification of emotional disorders. *Depression and Anxiety, 25*(4), 282–288. http://doi.org/10.1002/da.20496.

Wilson, K., Gullone, E., & Moss, S. (1998). The youth version of the positive and negative affect schedule: A psychometric validation. *Behaviour Change, 15*(3), 187–193. http://doi.org/10.1017/S0813483900003077.

Wright, A. G. C., Krueger, R. F., Hobbs, M. J., Markon, K. E., Eaton, N. R., & Slade, T. (2013). The structure of psychopathology: Toward an expanded quantitative empirical model. *Journal of Abnormal Psychology, 122*(1), 281–294. http://doi.org/10.1037/a0030133.

Zeigler-Hill, V., & Abraham, J. (2006). Borderline personality features: Instability of self-esteem and affect. *Journal of Social and Clinical Psychology, 25*(6), 668–687. http://doi.org/10.1521/jscp.2006.25.6.668.

Zvolensky, M. J., Paulus, D. J., Bakhshaie, J., Garza, M., Ochoa-Perez, M., Medvedeva, A., . . . Schmidt, N. B. (2016). Interactive effect of negative affectivity and anxiety sensitivity in terms of mental health among Latinos in primary care. *Psychiatry Research, 243*, 35–42. http://doi.org/10.1016/j.psychres.2016.06.006.

Negative Appraisals

Laure Freydefont
University of Zurich, Zurich, Switzerland

Definition

Negative appraisals refer to the process through which people evaluate or appreciate a particular negative encounter in the environment that is relevant to his or her well-being.

Appraisal Theories and the Origin of Negative Appraisals

Although the term of appraisal has been commonly used in the literature for several decades (e.g., Arnold 1960), the controversy regarding the structure and the function of appraisal remains a concern. The present entry will first describe the emergence of the term "negative appraisal" in the literature and propose a clear definition of "negative appraisals."

Lazarus and Folkman (1984) defined the concept of appraisal as "a process through which the person evaluates whether a particular encounter with the environment is relevant to his or her well-being." They distinguished between two types of appraisal: a primary appraisal and a secondary appraisal. In a primary appraisal, people evaluate whether they have anything at stake in the encounter or the potential benefits for well-being according to factors such as their own personality, values, and commitment. In secondary appraisal, people evaluate the opportunities to prevent harm or to improve the prospects for experiencing a benefit. Thus, various coping strategies (e.g., changing the situation, accepting it, seeking more information, or holding back from acting impulsively) can be used. After the individual finishes appraising the valence of the event, the second phase begins which consists of appraising their ability to cope with the event. In this general sense, appraisal can be considered to be a cognitive evaluation of different variables or events composing a situation.

Among the numerous theories concerning appraisal, most of them assume that emotions come from evaluations of events (Lazarus 1991; Scherer 2001; Smith and Ellsworth 1985) rather than the other way around (see Clore and Ortony 2001). As people are continually evaluating events from the environment, emotions should result from patterns of evaluation known as appraisal structures (Silvia 2005). According to numerous authors, cognitive appraisal does not require consciousness and control (Roseman and Smith 2001). These appraisal theories define appraisal as the process of detecting and assessing the significance of the environment in order to improve well-being (Moors et al. 2013) and do not make distinction between negative and positive appraisal.

However, based on Lazarus' stress model, Lawton et al. (1989) defined the term "caregiving appraisal" as a large category including cognitive appraisal, affective appraisal, and reappraisal of a potential stressor encountered in the environment and the efficacy of one's coping efforts. In this context, caring was defined as "the affective component of one's commitment to the welfare of another" and caregiving being defined as "the behavioural expression of this commitment" (Pearlin et al. 1990). Therefore, Lawton and collaborators (1989) conceptualized caregiving satisfaction as representing the constructs of positive and negative appraisal.

Negative Appraisals

"Negative appraisals" is a less common term used in the literature. Based on Lawton and colleagues' research, Pruchno et al. (1995) presented a theoretical model for the understanding of family members' well-being living in multigenerational households. This model includes "negative appraisals" as a variable influencing well-being of caregivers and care-receivers among their own family. Harwood et al. (2000) reported a study investigating the influence of the predictors of satisfaction and burden, conceptualized as positive and negative caregiving appraisals among caregivers (Lawton et al. 1989). The authors considered negative appraisals as the evaluation of the negative influence of caregivers on patient's health. In the same line of research, Toohey et al. (2016) use the term negative appraisals as the perceptions of stigma, of losses connected to caregiving.

Moreover, Brown and Jones (2010) used the term negative appraisal in the context of evaluation of the level of pain. In their study, the authors referred to negative appraisal as the negative evaluation of the unpleasantness of the painful stimuli. According to this recent research, "negative appraisal" seems to be characterized as an evaluation or estimation of a negative event or

stimulation. Finally, the term "negative appraisals" is also found in research on post-traumatic stress disorder (PTSD; Ehlers and Clark 2000; Zuj et al. 2017). In this context, the authors refer to "negative appraisals" as the negative evaluation relating to the trauma and its sequelae. Here also, the use of "negative appraisals" is based on the idea that individuals negatively appreciate an event or a situation.

To conclude, negative appraisals is a recent term which appeared in the psychological literature during the past few decades (Lawton et al. 1989). Taking into account the different uses of the term appraisal in the scientific literature and more recent research, the term "negative appraisals" could be defined as the process through which people evaluate or appreciate a particular negative encounter in the environment that is relevant to his or her well-being.

Cross-References

- ▶ Appraisal Theory of Emotion
- ▶ Self-Appraisals

References

Arnold, M. B. (1960). *Emotion and personality (2 vols)*. New York: Columbia University Press.

Brown, C. A., & Jones, A. K. P. (2010). Meditation experience predicts less negative appraisal of pain: Electrophysiological evidence for the involvement of anticipatory neural responses. *Pain, 150*, 428–438. https://doi.org/10.1016/j.pain.2010.04.017.

Clore, G. L., & Ortony, A. (2001). Appraisal theories how cognition shapes affect into emotion. In M. Lewis, J. A. Haviland-Jones, & L. Feldman Barret (Eds.), *Handbook of emotions* (3rd ed., pp. 628–642). New York: the Guilford Press.

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behavior Research and Therapy, 38*, 319–345. https://doi.org/10.1016/j.jad.2017.04.016.

Harwood, D. G., Barker, W. W., Owny, R. L., Bravo, M., Aguero, H., & Duara, R. (2000). Predictors of positive and negative appraisal among Cuban American caregivers of Alzheimer's disease patients. *International Journal of Geriatric Psychiatry, 15*, 481–487. https://doi.org/10.1002/1099-1166(200006)15:6<481::AID-GPS984>3.0.CO;2-J.

Lawton, M. P., Kleban, M. H., & Moss, M. (1989). Measuring caregiving appraisal. *Journal of Gerontology: Psychological Sciences, 44*, 61–71 https://academic.oup.com/geronj/article-abstract/44/3/P61/595300/Measuring-Caregiving-Appraisal.

Lazarus, R. S. (1991). *Emotion and adaptation*. New York: Oxford University Press.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal and coping*. New York: Springer.

Moors, A., Ellsworth, P. C., Scherer, K. R., & Frijda, N. H. (2013). Appraisal theories of emotion: State of the art and future development. *Emotion Review, 5*, 119–124. https://doi.org/10.1177/1754073912468165.

Pearlin, L. I., Mullan, J. T., Semple, S. J., & Skaff, M. M. (1990). Caregiving and the stress process: An overview of concepts and their measures. *Gerontologist, 30*, 583–594 https://academic.oup.com/gerontologist/article-abstract/30/5/583/564941/Caregiving-and-the-Stress-Process-An-Overview.

Pruchno, P. A., Peters, N. D., & Burant, C. J. (1995). Mental health of co-resident family caregivers: Examination of a two-factor model. *Journal of Gerontology: Psychological Sciences, 50B*, 247–256. https://doi.org/10.1093/geronb/50B.5.P247.

Roseman, I. J., & Smith, C. A. (2001). Appraisal theory: Overview, assumptions, varieties, controversies. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 3–19). New York: Oxford University Press.

Scherer, K. R. (2001). Appraisal considered as a process of multi-level sequential checking. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 92–120). New York and Oxford: Oxford University Press.

Silvia, P. J. (2005). What is interesting? Exploring the appraisal structure of interest. *Emotion, 5*, 89–102. https://doi.org/10.1037/1528-3542.5.1.89.

Smith, C. A., & Ellsworth, P. C. (1985). Patterns of cognitive appraisal in emotion. *Journal of Personality and Social Psychology, 43*, 813–838. https://doi.org/10.1037/0022-3514.48.4.813.

Toohey, M. J., Muralidharan, A., Medoff, D., Lucksted, A., & Dixon, L. (2016). Caregiver positive and negative appraisals. Effects of the national alliance on mental illness family-to-family intervention. *The Journal of Nervous and Mental Disease, 204*, 156–159. https://doi.org/10.1097/NMD.0000000000000447.

Zuj, D. V., Palmer, M. A., Gray, K. E., Hsu, C. M. K., Nicholson, E. L., Mahli, G. S., Bryant, R. A., & Felmingham, K. L. (2017). Negative appraisals and fear extinction are independently related to PTSD symptoms. *Journal of Affective Disorders, 217*, 246–251. https://doi.org/10.1016/j.jad.2017.04.016.

Negative Assortative Mating

- ▶ Assortative Mating Model

Negative Attitude Toward Others

► Prejudice

Negative Attributional Style

► Attributional Styles

Negative Beliefs

► Depressive Schemata

Negative Emotional Accounts

► Negative Emotional Narratives

Negative Emotional Narratives

Antonietta Curci
University of Bari Aldo Moro, Bari, Italy

Synonyms

Negative emotional accounts; Negative emotional retelling; Negative emotional stories

Definition

Negative emotional narratives are a type of retelling that individuals produce after having experienced a negative emotional episode. They might have either a written or oral form and always presuppose an addressee, real or symbolic (i.e., a diary), to whom the content is exposed.

Following a negative event, individuals narrate what they have experienced along with expressing their emotional feelings and referring personal evaluations and associated meanings. If follows that negative emotional narratives do not simply correspond to objective reproductions of unpleasant facts; instead they are personal reconstructions of memory contents intertwined into the individual's life story.

Contents and Structure of Negative Emotional Narratives

Negative narratives are influenced by the perceived impact of the original emotional experience. The contents and structure of these accounts reflect the memory processes activated in encoding and retelling of a negative event. Narratives concerning highly intense and traumatic experiences are poorly organized and fragmented, accompanied by recollections of sensorial/perceptual/emotional details (Crespo and Fernández-Lansac 2016). When individuals are faced with traumatic episodes, a sensory/visuospatial encoding of their experience prevails, and this leads to a preferential, although poorly organized, storage of sensorial/perceptual/emotional material (Brewin et al. 2010). As a consequence, narrative reports concerning these episodes abound with sensorial/perceptual/emotional details. A different line of research, focusing on autobiographical memory, has shown that richness of sensory details and temporal coherence characterize narrative accounts of very integrated representations in the autobiographical knowledge base, which go under the suggestive label of *Flashbulb memories* (Curci and Conway 2013).

With respect to their structure, negative emotional narratives represent a form of cognitive elaboration of the experience. The higher the impact of a negative episode upon the individual's life and symbolic systems, the more cognitive work is required to reduce the subjective imbalance created by the original experience and its consequences. Negative events introduce a sort of discrepancy in the course of ordinary life, so that individuals strive to reduce this discrepancy

and make predictable outcomes from unwanted exceptions. Narratives represent a tool for reducing this discrepancy and making sense of upsetting experiences (Bruner 1990). Through storytelling, private conversations, and mental ruminations, individuals build narrative accounts of their experiences, which then become increasingly integrated into an acceptable symbolic system. Achieving narrative coherence mirrors the individual's effort to make sense of what happened. A coherent narrative thus encompasses orienting and contextual elements, referential information concerning personal involvement in the event, and evaluative components (Reese et al. 2011). Clinical studies have indeed shown that a successful treatment of traumatic experiences involves a decrease in fragmentation and an increase in the organization of related narratives (Foa and Rothbaum 1998).

Functions and Benefits of Negative Emotional Narratives

Literature on social sharing of emotions has provided evidence on the different functions accomplished by negative narratives (Rimé 2009). Through private conversations with significant others, individuals elaborate on their emotional memories in order to reduce the distress associated with them. Social sharing of emotions develops along a continuum from mundane emotional experiences to traumatic accidents, in social interactions with real people or fictional interlocutors, such as in the cases of an artistic production, a literary piece, or a private diary. The process of sharing ensues from any negative emotion, including shame and guilt, which are the least acceptable forms of emotional reactivity from a social point of view, and it is not influenced by individual differences (i.e., sex, age, race, education, etc.). A very basic function of social sharing is to rehearse significant experiences, thus contributing to memory consolidation. Rimé also distinguished between socio-affective and cognitive functions of sharing emotions. As to the affective functions, studies have shown that, in narrating personal negative experiences, individuals seek and obtain social support, mitigate the sense of loneliness, stimulate attachment behavior, and enhance threatened self-esteem. Sharing negative emotions elicits empathy in others, stimulates bonding in a social environment, and strengthens social ties, thus prompting benefits at both an individual and collective level. With regard to cognitive functions, in narrating their experiences individuals achieve cognitive articulation of related mental representations, accommodate models and schemes of the world, diminish the persistence of distressing memory elements (i.e., unpleasant bodily signals related with the emotional state, ambiguous exteroceptive and interoceptive stimulations), and rearrange the hierarchy of goals overturned by the upsetting event. Finally, emotional retelling tends to propagate, in that recipients of emotional disclosures engage in turn in a secondary or even tertiary social sharing. Emotional narratives become then the way through which emotional knowledge spreads out across social environments.

The Writing Paradigm

The investigation of the functions and benefits of narrating emotional experiences has received a great impact from the studies of James W. Pennebaker, from the University of Texas at Austin. In hundreds of articles and several books, Pennebaker and his followers have shown that the disclosure of personal emotional events is associated with later health benefits as assessed by physician visits, reported symptoms, immunological functions, as well as with many other indices of subjective well-being. The method adopted consists in fostering disclosure by asking participants to write down about past emotional events. The first studies were ran on college students and adopted experimental or quasi-experimental approaches. Over the years, the so-called writing paradigm has been extended to more naturalistic contexts such as computer-mediated communication, social media, school, and workplaces and applied to special samples of prison inmates, alcohol consumers, war veterans, etc.

Pennebaker has also set up computerized tools, known as Linguistic Inquiry and Word Count (LIWC), useful to screen texts concerning negative and traumatic experiences to find the linguistic correlates of psychological processes concerning attentional focus, emotional states, social relationships, thinking styles, and individual differences (Tausczik and Pennebaker 2010). The output of the analysis is an index of word use within a large set of linguistic (e.g., first-person singular pronouns, conjunctions), psychological (e.g., anger, insight), and topical (e.g., work, money) categories. The idea underlying this approach is that putting an emotional episode into words leads to recovery from the related emotional distress. Studies by Pennebaker constitute the foundation of the writing therapy, which has been proven to help victims and survivals of traumas to achieve psychophysical health benefits and improve the quality of their life following distressing experiences. Consistent with this line of work, researchers have shown that narrative methodology can help individuals to achieve a posttraumatic growth, by restructuring their identity in a positive self-representation that goes beyond the threats of past life adversities (Pals and McAdams 2004).

The Collective Dimension

Negative emotional narratives can be investigated from both an individual and a social perspective. Given its relational nature, the act of narrating contributes to consolidating the link between the personal life course and the familiar, social, and cultural contexts in which the individual is imbedded. Studies on social processes in elaboration of historical traumas have demonstrated that narratives strengthen the sense of belonging to social groups, thus contributing to the formation of the individual's personal and social identity and shaping the collective identity of social groups (Pennebaker et al. 2013). In this sense, negative emotional retelling does not simply represent an individual process, but it also reflects the needs, motives, and objectives of social groups and constitutes the first step toward the construction of shared representations of the historical past.

Cross-References

- ▶ Cognitive-Affective Processing System
- ▶ Disclosure Reciprocity
- ▶ Emotional Affectivity
- ▶ Emotional Intensity
- ▶ Emotion Regulation
- ▶ Linguistic Approach
- ▶ Negative Affectivity
- ▶ Negative Appraisals
- ▶ Negative Events
- ▶ Posttraumatic Growth
- ▶ Post-Traumatic Stress Disorder
- ▶ Received Support
- ▶ Rumination
- ▶ Social Support Processes
- ▶ Trauma

References

Brewin, C. R., Gregory, J. D., Lipton, M., & Burgess, N. (2010). Intrusive images in psychological disorders: Characteristics, neural mechanisms, and treatment implications. *Psychological Review, 117*, 210–232.

Bruner, J. (1990). *Acts of meaning*. Cambridge, MA: Harvard University Press.

Crespo, M., & Fernández-Lansac, V. (2016). Memory and narrative of traumatic events: A literature review. *Psychological Trauma: Theory, Research, Practice, and Policy, 8*, 149–156.

Curci, A., & Conway, M. A. (2013). Playing the flashbulb memory game: A comment on Cubelli and Della Sala. *Cortex, 49*, 352–355.

Foa, E. B., & Rothbaum, B. O. (1998). *Treating the trauma of rape*. New York: Guilford Publications.

Pals, J. L., & McAdams, D. P. (2004). The transformed self: A narrative understanding of posttraumatic growth. *Psychological Inquiry, 15*, 65–69.

Pennebaker, J. W., Paez, D., & Rimé, B. (2013). *Collective memory of political events: Social psychological perspectives*. Mahwah: Psychology Press.

Reese, E., Haden, C. A., Baker-Ward, L., Bauer, P., Fivush, R., & Ornstein, P. A. (2011). Coherence of personal narratives across the lifespan: A multidimensional model and coding method. *Journal of Cognition and Development, 12*, 424–462.

Rimé, B. (2009). Emotion elicits the social sharing of emotion: Theory and empirical review. *Emotion Review, 1*, 60–85.

Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology, 29*, 24–54.

Negative Emotional Retelling

► Negative Emotional Narratives

Negative Emotional Stories

► Negative Emotional Narratives

Negative Emotionality

► Neuroticism

Negative Events

Erica B. Slotter
Department of Psychological and Brain Sciences, Villanova University, Villanova, PA, USA

Synonyms

Acute stressors; Negative life events; Social role losses

Definition

Negative events refer to any occurrence in a person's life that had changed their life for the worse – either objectively or in their subjective perception. Negative events frequently encompass experiences that would be considered major life events, including financial hardship, job loss, divorce, and bereavement, and are often considered to be prototypical examples of acute stressors. Many negative events also encompass a person losing a valued social role from their sense of identity, such as when someone going through a divorce loses the social role of "spouse."

Introduction

Throughout their lives, people experience a wide variety of impactful life events. From graduating high school, to changing jobs, to getting married, to having children, or getting divorced, we all go through transitions that fundamentally alter who we are. Although some transitions, such as getting married or starting a career, are positive in nature, these transitions also include negative events such as the loss of a job or a valued relationship. Unfortunately, these negative experiences often adversely affect individuals. Such life events can predict heightened feelings of anxiety, depression, and general distress (e.g., Jetten et al. 2002). The central goal of the present entry is to discuss how negative events in people's lives influence their well-being, in particular through the mechanism of identity change and confusion.

Negative Events

Negative events will occur in the lives of almost all people. From losing a job, to serious illness, to getting a divorce, and to bereavement over the loss of a loved one, almost every adult human being will encounter hardship and failure in their lifetime. Understanding the impact that these events have on us is a crucial task for psychologists due to the potent risks that these negative events present for both psychological and physical well-being. However, beyond understanding what negative outcomes are associated with negative life events, we must also understand why these events are so impactful. The present entry explores how negative life events are related to well-being and proposes that one mechanism that drives this association are the changes to people's identity that are often brought about by negative life events.

Negative Events and Well-Being. It is perhaps unsurprising that negative events can profound influence people's psychological and physical well-being. Major life events, including both positive and negative ones, can predict increases in people's levels of stress, general

emotional distress, and subclinical levels of anxiety and depression (e.g., Jetten et al. 2002). These effects can be exacerbated to the extent that the life event in question is perceived by the person experiencing it to be a negative event (Slotter and Walsh in press). For example, the loss of a romantic relationship predicts elevated levels of emotional distress and depressive symptomology (e.g., Slotter et al. 2010) and even negative physical health outcomes such as increased mortality risk and suppressed immune function (e.g., Kiecolt-Glaser and Newton 2001).

Of course there are many moderators of the impact that negative events have on well-being that are beyond the scope of the present entry. There are also several different mechanisms that researchers have argued for as the pathways by which negative events generate distress. However, one mechanism linking negative events to well-being outcomes, specifically psychological well-being outcomes, that has only recently begun to be explored and is the focus of the current entry is the impact that negative events often have on people's identity.

Negative Events and Identity. People's identity, often called their self-concept, is a cognitive structure, much like a schema, that is developed through people's self-reflections as well as their experiences out in the world. The content of a person's identity consists of the myriad attributes, aspirations, views, values, beliefs, attitudes, social roles, and even possessions that they identify as being "me," or "mine," (e.g., McConnell 2011). Identity can be both consistent over time and contextually malleable, with some aspects fairly stable and others more prone to change across time and situation (e.g., McConnell 2011). Crucially, identity is largely socially created and defined; people's self-views largely are dynamic reflections of their social worlds and relationships.

People reflect on both the content of their identity and its consistency across time, and this assessment determines their self-concept clarity. A construct called self-concept clarity encompasses people's subjective sense that their overall identities are clear, cohesive, and consistent over time (e.g., Campbell et al. 2003). Although related, the individual characteristics and other content contained in the self-concept are both conceptually and empirically distinct from people's holistic, metacognitive judgments of self-concept clarity. Higher self-concept clarity is associated with personality traits, such as less neuroticism and greater agreeableness, as well as a host of positive well-being outcomes (e.g., Campbell et al. 2003). Although often viewed as a fairly stable, trait-like characteristic, research has demonstrated that a variety of situational factors can alter self-concept clarity, including negative events (e.g., Slotter et al. 2010).

Negative events can be central catalysts of changes in self-concept content and clarity, often because these events represent major life transitions that change the social roles that we fulfill, such as losing a job or getting a divorce. With regard to the content of people's identity, negative events that encompass losing social roles can result in self-concept constriction, wherein people lose attributes or characteristics from their identity that they previously possessed (e.g., Mattingly et al. 2014). For example, if a person's romantic relationship ends, they lose not only the companionship associated with that relationship but also the myriad ways that that relationship helped to shape who they are. They lose the social role of being a romantic partner (Light and Visser 2013), and can even jettison other characteristics that they embodied specifically within the relationship (Slotter et al. 2014), resulting in a self-concept that is quite literally smaller, or encompasses fewer attributes (e.g., McIntyre et al. 2014; Slotter et al. 2010).

The changes that people experience in the content of their identity after a negative event contribute to reductions in their self-concept clarity (e.g., Slotter and Walsh in press; Slotter et al. 2010, 2014), with greater identity change predicting less identity clarity. Indeed, recent work has established that losing important social roles, which as previously stated often coincides with negative life events such as divorce, predicts elevated feelings of identity confusion, or reduced self-concept clarity, to a greater extent than

gaining new social roles, which often coincide with positive events such as marriage (Light and Visser 2013; Slotter and Walsh in press). This reduction in self-concept clarity is especially pronounced when people associate low levels of positive emotions with the event (Slotter and Walsh in press).

Negative events can have important implications for people's identity clarity over time as well. For example, the loss of a romantic relationship predicts reduced self-concept clarity among college students at the time of the breakup itself but also over the course of the following 3 months. (e.g., Slotter et al. 2010). Similar effects have been established in divorcing adults (Sbarra and Borelli 2013).

Negative Events and Well-Being Through an Identity Change Mechanism. The importance of understanding negative events that influence people's identity comes from the association between identity change and clarity and well-being outcomes. We already know that negative events predict negative well-being outcomes for many individuals, but one potential mechanism for this effect that has only recently begun to be explored is the impact that negative events have on people's selves – especially their self-concept clarity. As discussed in the previous section, the content of people's identity is altered and often constricted in the wake of negative life events, and this is related to them feeling uncertain about who they are or experiencing low self-concept clarity (e.g., Slotter et al. 2010; Slotter and Walsh in press). Additionally, self-concept clarity at the trait level is generally associated with positive personal and relational outcomes (e.g., Campbell et al. 2003).

Beyond this individual difference association with positive outcomes, self-concept clarity also is related to people's adjustment in the wake of negative life events. After a negative life event, in particular one that involved the loss of a valued social role, the decrements in self-concept clarity that people tend to experience are related to poorer psychological functioning. Specifically, among college student who had just experienced the breakup of a romantic relationship, the reductions in self-concept clarity that followed contributed uniquely to the amount of depressive symptomology that they reported (Slotter et al. 2010). Greater reductions in self-concept clarity in the months following the dissolution of the dating relationship predicted higher levels of subclinical depressive symptomology, even when accounting for other factors that might contribute to participants' distress, including feelings of rejection, feelings of surprise, and who initiated the breakup. Among divorcing adults, a less clear sense of identity also predicted high levels of subclinical depressive symptomology 3 month later (Sbarra and Borelli 2013). Thus, the reductions in identity clarity that people tend to experience in the wake of negative events, relationship dissolution in the present example, are intimately tied with their psychological experiences and adjustment.

Conclusion

Taken together, negative events can profoundly impact people. Experiencing a negative life event, such as the loss of a valued social role, is associated with decrements in both psychological and physiological functioning. Although many different pathways have been proposed to account for this connection, one mechanism that research has only recently started to explore deals with the influence of negative events on people's perceptions of their identities. Overall, negative events, specifically those that involve the loss of social roles, predict changes in people's self-concepts. People report that their identity is in a state of flux and oftentimes feels constricted, or reduced, after these negative experiences. Furthermore, people often report that they feel confused about who they are after a negative event; a reduction in their self-concept clarity. This reduction in identity clarity has been shown to uniquely account for a portion of the psychological distress and the disruptions in psychological functioning that people experience in the wake of negative events. Thus, the changes to people's identity that occur when they experience unpleasant life circumstances, especially with regard to the clarity with which they define themselves, are important to

understand as they serve as one pathway through which people are impacted by the negative events that occur in their lives.

Cross-References

- ▶ Assessment of Situational Influences
- ▶ Life-Story Model of Identity
- ▶ Negative Appraisals
- ▶ Personality and Divorce
- ▶ Self-Concept Clarity

References

Campbell, J. D., Assanand, S., & Di Paula, A. (2003). The structure of the self-concept and its relation to psychological adjustment. *Journal of Personality, 71*(1), 115–140.

Jetten, J., O'Brien, A., & Trindall, N. (2002). Changing identity: Predicting adjustment to organizational restructure as a function of subgroup and superordinate identification. *British Journal of Social Psychology, 41*(2), 281–297.

Kiecolt-Glaser, J. K., & Newton, T. L. (2001). Marriage and health: His and hers. *Psychological Bulletin, 127*(4), 472.

Light, A. E., & Visser, P. S. (2013). The ins and outs of the self: Contrasting role exits and role entries as predictors of self-concept clarity. *Self and Identity, 12*(3), 291–306.

McConnell, A. R. (2011). The multiple self-aspects framework: Self-concept representation and its implications. *Personality and Social Psychology Review, 15*(1), 3–27.

McIntyre, K. P., Mattingly, B. A., & Lewandowski, G. W. (2014). "You make me a better/worse person": A two-dimensional model of relationship self-change. *Personal Relationships, 21*(1), 176–190.

Sbarra, D. A., & Borelli, J. L. (2013). Heart rate variability moderates the association between attachment avoidance and self-concept reorganization following marital separation. *International Journal of Psychophysiology, 88*, 253–260.

Slotter, E.B., & Walsh, C. (in press). All life events are not experienced equally: The associations between self-change and emotional reactions predicting self-concept clarity in the wake of role transitions. *Self and Identity.*

Slotter, E. B., Gardner, W. L., & Finkel, E. J. (2010). Who am I without you? The influence of romantic breakup on the self-concept. *Personality and Social Psychology Bulletin, 36*(2), 147–160.

Slotter, E. B., Emery, L. F., & Luchies, L. B. (2014). Me after you: Partner influence and individual effort predict rejection of self-aspects and self-concept clarity after relationship dissolution. *Personality and Social Psychology Bulletin, 40*(7), 831–844.

Negative Expectations

▶ Pessimism

Negative Life Events

▶ Negative Events

Negative Mood

▶ Negative Affectivity

Negative Punishment

▶ Punishment

Negative Thinking

▶ Pessimism

Negatively Related to Conscientiousness

▶ Procrastination

Negativity Bias

▶ Loss Aversion

Neglect

▶ Child Abuse and Neglect

Neglect/Overburdening Childhood Situations

Sarah Moses
Adler University, Chicago, IL, USA

Synonyms

Abandonment; Abuse

Definition

Neglect is the failure to provide necessities to a child, including affection, and can occur via abandonment of a child, as well as when a parent is physically present yet fails to provide. An overburdening childhood situation is a concept that Alfred Adler, founder of Adlerian psychology or Individual psychology, used to describe situations in which children are exposed to severe stressors and difficult situations in their childhood. Adler included neglect under the broader umbrella of overburdening childhood situations.

Introduction

Alfred Adler, the founder of Adlerian psychology or Individual psychology, included "children who suffer from neglect, abuse, or being hated and unwanted," pampered children, and children with severe organ inferiorities, under the category of overburdening childhood situations (Griffith and Powers 2007, p. 77). Prior to his discussion of overburdening childhood situations, as early as 1908, Adler talked about the need for affection, which preceded the broader concept of social interest, a central tenet of Adlerian theory (Ansbacher and Ansbacher 1956). This entry will begin with a discussion of the need for affection as the precedent to social interest, followed by Adler's examples of overburdening childhood situations, and will conclude with an explanation of Adler's view on the relationship between overburdening childhood situations and social interest.

The Need for Affection

In 1908, Alfred Adler wrote about the need for affection (original German *zärtlichkeitsbedürfnis*) stating that "the strength of the affectional tendencies, the psychological apparatus which the child can bring into play to achieve satisfaction, and the way in which he bears lack of satisfaction represent an essential part of the child's character" (Ansbacher and Ansbacher 1956, p. 39–40). Adler pointed out the tendency children have "to cuddle up, always remain close to loved persons, and want to be taken into bed with them" (p. 40) and explained that this initial need for affection broadens to include friendships and "social feelings" (p. 40). As Adler developed his theory further, the need for affection evolved to form one of the most central tenets of Adler's theory, social interest (original German *gemeinschaftsgefühl*). Although the concept of *gemeinschaftsgefühl* does not have a perfect translation from German into English, some have translated the word as community feeling, social interest, or perhaps more accurately as a combination of the two. Community feeling is an affect (Watts 2012) in which an individual feels a connection and sense of belonging to others, or empathy (Carlson and Englar-Carlson 2017). When an individual feels disconnected, he or she may become focused inward and stuck without movement, in a discouraged state of isolation. This state of being stuck and focused inward is in contrast to social interest, which is action oriented (Watts 2012) and has been defined by some as "participation in the common good" (Carlson and Englar-Carlson 2017). Social interest is viewed as a potential one is born with that must be developed (Manaster and Corsini 1982) and is viewed by many as indicative of mental health.

Overburdening Childhood Situations and Social Interest

Alfred Adler, as he described overburdening situations in his writings, provided the examples of neglect, pampered children, and organ inferiorities. According to Adler, a neglected child, or a child that is hated and unwanted, is a child who has "found society cold to him and will expect it

always to be cold" and "never quite found a trustworthy other person" (Ansbacher and Ansbacher 1956, p. 371). Pampered children are children who get whatever they want, when they want it, without needing to give anything in return and therefore never learn the value in cooperating with others. Adler stated, regarding a pampered child, "he has lost his independence and does not know that he can do things for himself" (p. 369). Adler described children who were born with "imperfect organs" or who suffered from a childhood disease as children that may have attention focused on their illness or on "their own sensations," at the expense of interest in others, and may feel inadequate or inferior due to ridicule by others (p. 368).

Children are innately driven toward others. Those who experience overburdening childhood situations such as these, however, may not have developed their social interest and may feel a heightened sense of inferiority. Adler commented that "to be human means to feel inferior" (p. 115) and these feelings of inferiority serve as motivators to overcome obstacles and move toward growth. Many Adlerians refer to this as movement from a felt minus to a felt plus, and this is present in both adults and children. Children however, who naturally have feelings of inferiority because they are smaller and dependent, are likely to find overburdening childhood situations as evidence of their inferior status, solidifying their belief (Manaster and Corsini 1982). According to Adler, "the growing infant takes into account all the impressions he receives, those from his own body and those from the external environment, and under their influence creatively forms his opinion of himself and the world, together with his idea of his individual goal of success" (Ansbacher and Ansbacher 1956, p. 366). This deeply engrained sense of inferiority is likely to lead to a lack of "social interest, courage, and self confidence" (p. 118) and may set the conditions for what Adler called the "neurotic disposition" (p. 366).

Conclusion

Overburdening childhood situations may lead to a heightened sense of inferiority and later life challenges as illustrated in Adler's example of a "boy who felt neglected when he noticed that his mother showed affection only to his younger brother, and therefore wandered through life searching for warmth and affection he had missed in earliest childhood" (Adler 2011, p. 43). It is important to note that Adler did not believe that this outcome was inevitable. Adler recognized that children who were neglected in childhood must have received some form of care or they would not have survived as infants; therefore, Adler cautioned against thinking of these children as "pure types," destined to a life of isolation (Ansbacher and Ansbacher 1956, p. 371). Although Adler placed great emphasis on the social context, Adler stated that our environments only provide a probability, but do not determine our situation. Individuals "are self-determined by the meaning" they give to their situations (Adler 1980, p. 14). Rather than an overburdening situation being a guarantee of difficulties, Adler believed that overburdened children were faced with a higher probability of developing styles of life, "the instructions for how to belong" (Carlson and Englar-Carlson 2017, p. 142) or convictions about self, others, and the world, with an underdeveloped social interest.

Cross-References

- Child Abuse and Neglect
- Individual Psychology (Adler)
- Organ Inferiority
- Pampering/Spoiling
- Parental Influence on Personality Development (Adler)
- Style of Life

References

Adler, A. (1980). In A. Porter (Ed.), *What life should mean to you*. New York : Perigee/G/P. Putnam. (Original work published 1931).

Adler, A. (2011). *Understanding human nature*. Oxford: One World Publications. (Original work published 1927).

Ansbacher, H. L., & Ansbacher, R. R. (Eds.). (1956). *The individual psychology of Alfred Adler: A systematic presentation in selection from his writings*. New York: Harper Torchbooks.

Carlson, J., & Englar-Carlson, M. (2017). *Adlerian psychotherapy*. Washington, DC: American Psychological Association.

Griffith, J., & Powers, R. L. (2007). *The lexicon of Adlerian psychology: 106 terms associated with the individual psychology of Alfred Adler*. Port Townsend: Adlerian Psychology Associates, Ltd.

Manaster, G. J., & Corsini, R. J. (1982). *Individual psychology: Theory and practice*. Chicago: Adler School of Professional Psychology.

Watts, R. (2012). On the origin of striving for superiority and social interest. In J. Carlson & M. Maniacci (Eds.), *Alfred Adler revisited* (pp. 41–46). New York: Routledge, Taylor & Francis.

NEO Inventories

John E. Kurtz
Department of Psychology, Villanova University, Villanova, PA, USA

Definition/Introduction/Main Text

The NEO Inventories refer to a set of structured psychological tests designed to assess the five-factor model of basic personality traits (FFM; Digman 1990; Goldberg 1990). Full-length and abbreviated versions are available for obtaining self-reports and informant ratings of the FFM traits. These instruments are published by Psychological Assessment Resources, Inc. in Lutz, Florida (www.parinc.com). The main dimensions of the FFM are measured by domain scores, and these domains break down into more specific subscales called facets. The original NEO Inventory (Costa and McCrae 1985) included six facet scales for three of the five domains (Neuroticism, Extraversion, Openness to Experience). The first revision (NEO-PI-R, Costa and McCrae 1992) added six facet scales for both the Agreeableness and Conscientiousness domains. A 60-item abbreviated version called the NEO-Five Factor Inventory (NEO-FFI) was included in the first revision which measures the five domains with 12-item scales. The second and most recent revision of instrument (McCrae and Costa 2010) has produced full-length (NEO-PI-3) and short versions (NEO-FFI-3) that can be used in self-report (Form S) or informant rating (Form R) formats. In addition to improvements in the psychometric properties of the test, the second revision made item replacements to reduce the reading requirements and enhance clarity. Thus, the NEO-PI-3 and NEO-FFI-3 can be used with respondents age 12 or older. A new normative sample employs responses from 635 adults for Form S to 649 adults for Form R for use with respondents aged 21 years or older. An adolescent normative sample was introduced based on responses of 500 adolescents (Form S) and 465 adolescents (Form R) for use with respondents aged 12–20 years.

The full-length versions of the NEO-PI-3 and NEO-PI-R contain 240 items, organized into five domains. Each domain is comprised of six facet scales of eight items. The facet scales of the Neuroticism domain are labeled Anxiety, Angry Hostility, Depression, Self-Consciousness, Impulsiveness, and Vulnerability. The facet scales of the Extraversion domain are labeled Warmth, Gregariousness, Assertiveness, Activity, Excitement-Seeking, and Positive Emotions. The facet scales of the Openness domain are labeled Fantasy, Aesthetics, Feelings, Actions, Ideas, and Values. The facet scales of the Agreeableness domain are labeled Trust, Straightforwardness, Altruism, Compliance, Modesty, and Tender-Mindedness. The facet scales of the Conscientiousness domain are labeled Competence, Order, Dutifulness, Achievement Striving, Self-Discipline and Deliberation. The domains and facet scales can be scored by hand or by using a software program that also generates an interpretive report.

The NEO Inventories have evolved across four decades of empirical research on the structure and stability of individual differences in adulthood. Accordingly, test validity is well established from longitudinal, cross-observer, genetic, and convergent and discriminant correlations with other relevant criteria. The domain and facet scales have been translated into more than 50 languages and dialects, and the test manual provides information for 24 published translations (McCrae and Costa 2010). One of the few criticisms of the NEO Inventories has been the absence of validity scales to check for

dissimulation or random responding. Although studies have demonstrated that such scales may be unnecessary in research contexts due to the infrequency of distorted responding (e.g., Kurtz and Parrish 2001; Piedmont et al. 2000), the impact of response biases is likely greater in assessment contexts with strong incentives for positive or negative self-presentation. Nonetheless, the NEO Inventories should prove to be useful assessment tools in a variety of applied settings, such as business organizations, counseling centers, and primary care practices. Research on the links between the FFM and personality disorders (Costa and Widiger 2002) suggests particular utility of the NEO Inventories for the assessment of psychopathology and enhanced understanding of problems in living.

References

Costa, P. T., & McCrae, R. R. (1985). *The NEO personality inventory manual*. Odessa: Psychological Assessment Resources.

Costa, P. T., & McCrae, R. R. (1992). *NEO PI-R professional manual*. Odessa: Psychological Assessment Resources.

Costa, P. T., & Widiger, T. A. (Eds.). (2002). *Personality disorders and the five-factor model of personality* (2nd ed.). Washington, DC: American Psychological Association.

Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual Review of Psychology, 41*, 417–440.

Goldberg, L. R. (1990). An alternative "description of personality": The big-five factor structure. *Journal of Personality and Social Psychology, 59*, 1216–1229.

Kurtz, J. E., & Parrish, C. L. (2001). Semantic response consistency and protocol validity in structured personality assessment: The case of the NEO-PI-R. *Journal of Personality Assessment, 76*, 315–332.

McCrae, R. R., & Costa, P. T. (2010). *NEO inventories professional manual*. Lutz: Psychological Assessment Resources.

Piedmont, R. L., McCrae, R. R., Riemann, R., & Angleitner, A. (2000). On the invalidity of validity scales: Evidence from self-reports and observer ratings in volunteer samples. *Journal of Personality and Social Psychology, 78*, 582–593.

Neo-Adlerians

► Neo-Freudians

Neodissociation Theory

Pamela Sadler[1] and Erik Woody[2]
[1]Department of Psychology, Wilfrid Laurier University, Waterloo, ON, Canada
[2]Department of Psychology, University of Waterloo, Waterloo, ON, Canada

Definition

Based on Janet's classic notion of dissociation, Hilgard (1977) proposed a *neodissociation theory* of hypnosis, the core concept of which was the division of consciousness into parallel, coexisting streams. Stemming from this theory, there are currently multiple alternative accounts of how dissociation may explain hypnotic phenomena.

Introduction

The concept of *désagrégration*, or *dissociation*, originated with Janet (1907), in his attempt to describe and explain various phenomena that appear to have a suggestive basis, such as hypnosis and some mental disorders. He proposed that a set of mental contents can become split off, or disassociated, from other mental processes and thus separated from awareness and voluntary control. Moreover, these dissociated contents may then be activated, outside of awareness, through suggestion.

Developing these ideas, Hilgard (1977) hypothesized that in hypnosis, an *amnesia-like barrier* can block some mental activity from the conscious access it would otherwise have. He also hypothesized that, with appropriate hypnotic suggestions, a *hidden observer* can be elicited, able to report the mental activity otherwise walled off from awareness in hypnosis.

Hierarchy of Cognitive Control Mechanisms

However, as part of his neodissociation theoretical framework, Hilgard also proposed other

hypotheses, less closely derived from Janet, about mechanisms underlying hypnosis. The basis for these hypotheses was a hierarchical model of cognitive control mechanisms, with the lower level consisting of many coexisting control subsystems and the higher level consisting of an executive system that governs the activity of the subsystems.

Hilgard hypothesized that hypnosis works by altering the function of this executive system in various ways. First, by weakening the executive role in planning and initiating new behavior, hypnosis would open the subsystems to more direct access through suggestion. Second, by weakening the executive role in monitoring activity in subsystems of control, hypnosis would minimize awareness of control over mental operations, leading to hypnotic responses being experienced as involuntary, occurring outside the person's will. Third, by weakening the executive role in providing feedback through monitoring to guide lower subsystems of control, hypnosis would interfere with the ability to distinguish imaginings from real events, leading to phenomena such as hypnotic hallucinations.

Bowers (1992) was an influential later proponent of neodissociation theory. By focusing on the explanation of involuntariness in hypnosis, he revealed an important inconsistency in Hilgard's views. The amnestic-barrier mechanism implies that a hypnotic response is enacted voluntarily in the usual way, but the perception of this self-agency is blocked from awareness. In this case, the experience of involuntariness would be an illusion, because the underlying control of behavior is unaffected. However, the altered-control mechanism implies that a hypnotic suggestion may relatively directly activate a subsystem of control, bypassing the normal executive initiative. In this case, the experience of involuntariness would reflect a genuine change in the underlying control of behavior, not an illusion.

In view of this inconsistency, Bowers argued that neodissociation theory actually consists of two distinct sub-theories of hypnosis: a theory of *dissociated experience* and a theory of *dissociated control*. According to the dissociated-experience account, hypnosis blocks self-perception of the volition involved in enacting suggestions. Thus, executive control would be operative in the usual way, but the individual would be unaware of the effort he or she actually expended to carry out a suggestion. In contrast, according to the dissociated-control account, in hypnosis subsystems of control tend to become dissociated from the executive system, bypassing its processes of volition and effortful control. Thus, executive effort in enacting suggestions would actually be low, which the individual would perceive accurately.

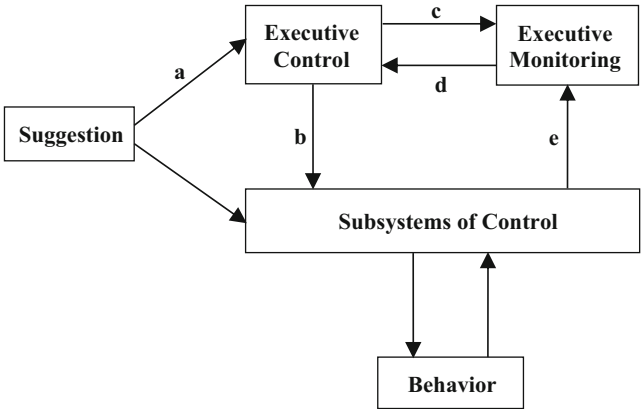
On the basis of various empirical findings, Bowers eventually proposed that dissociated control is the principal dissociative mechanism underlying hypnosis (Woody and Bowers 1994). However, other important theorists influenced by Hilgard, such as Kihlstrom (1992), have favored dissociated experience as the main mechanism in hypnosis.

Critique and Integrated Model

In an important critique of neodissociation theories, Kirsch and Lynn (1998) drew attention to what they viewed as the troubling inconsistencies between the different versions, such as dissociated experience and dissociated control. They were particularly critical of Hilgard's special mechanisms of the amnesic barrier and the hidden observer, which seemed to them to be little more than elusive analogies.

In response to this critique, Woody and Sadler (1998) advanced a model that avoided these special mechanisms and integrated the different theoretical positions about dissociation by interpreting them within dual-systems theories of action, as proposed by cognitive neuroscientists (e.g., Norman and Shallice 1986). In these dual-systems theories, two complementary systems manage the initiation and control of behavior. A higher, centralized executive system principally handles volitional, effortfully controlled acts, whereas a lower, diverse decentralized system mainly handles more stimulus-driven, routine acts.

Figure 1 provides a diagrammatic representation of the integrative model of hypnotic



Neodissociation Theory, Fig. 1 An integrative model of dissociation theories of hypnosis. A theory of *dissociated experience* involves the weakening of path *c* and possibly of path *e*. A theory of *dissociated control* involves the weakening of path *b* and possibly of path *a*. A theory of *second-order dissociated control* involves the weakening of path *d*. Reprinted from Woody and Sadler (2008, p. 90, Fig. 4.2). Reproduced by permission of Oxford University Press: https://global.oup.com/academic/rights/permissions/autperm/

dissociation based on dual systems (Woody and Sadler 2008). The higher, executive level is comprised of the modules of executive control and executive monitoring, and the lower level is comprised of diverse subsystems of control. According to dual-systems theories, the subsystems of control manage the selection and tracking of behavior, but the executive modules add a second level of control, associated with the experience of volition, that modulates the subsystems to fine-tune their function. A major feedback loop by which executive oversight of action occurs runs from executive control, to subsystems of control, to executive monitoring, and back to executive control. Within this loop, there is another important feedback loop between executive control and executive monitoring, by which information about intentions and goals is passed from executive control to executive monitoring and information about activity in the subsystems of control is passed via executive monitoring to executive control.

Dissociation theories of hypnosis may be interpreted as implying alterations in the function of these feedback loops. First, *dissociated experience* may involve the weakening of the path labeled *c*, the functional connection from executive control to executive monitoring, and possibly of the path labeled *e*, from subsystems of control to the executive monitor. In this way, the executive monitor would be walled off, or dissociated, from information about the self-mediated nature of ongoing behavior, which therefore would be poorly represented in awareness.

Second, *dissociated control* may involve the weakening of the path labeled *b*, the functional connection from executive control to the subsystems of control, and possibly of the path labeled *a*, from the suggestion to executive control. In this way, executive control would be relatively walled off, or dissociated, from the activation of behavior, and hypnotic suggestions could more directly activate lower subsystems of control, minimizing processes of volition and effortful control.

Third, another type of dissociated control, termed *second-order dissociated control*, may involve the path labeled *d*, from executive monitoring to executive control. Based on ideas from Hilgard, Jamieson and colleagues (e.g., Jamieson and Woody 2007) advanced the hypothesis that in hypnosis the executive monitor may provide weaker corrective feedback for fine-tuning executive control. This type of dissociation would involve weakened control of control, a second-order level of cognitive control.

Thus, the integrative model distinguishes among three subtypes of neodissociation theory,

while showing how they fit together conceptually. Although future research may favor one of these dissociative mechanisms over the others, it is also possible that hypnosis may involve a flexible mixture of multiple processes, depending on underlying individual differences and the type of suggestions offered.

Conclusion

To a considerable extent, neodissociation theories of hypnosis were developed to explain the differences between people who score as highly hypnotizable on standardized hypnosis scales versus those who score as low hypnotizable. Hence, underlying individual differences are an essential component of these theories. The prevailing assumption has been that people who score in the midrange on hypnosis scales are responding to suggestions using the same underlying processes as those high in hypnotizability, but to a lesser extent. However, alternatively it is possible that differences could be in kind, rather than degree, with dissociative processes characterizing how people who are particularly high in hypnotizability respond to hypnotic suggestions and other, non-dissociative processes possibly providing a better account of the responses of those in the midrange to low range.

In addition to explaining response to hypnosis, individual differences in proneness to dissociative phenomena may also underlie other, non-hypnotic phenomena. Indeed, Janet originally proposed that hypnosis and dissociative disorders are attributable to the same awareness-attenuating underlying mechanism. The hypothesis that high responsiveness to hypnosis and proneness to some types of mental disorders share a common trait-like core is currently an important topic of research (e.g., Terhune and Cardeña 2015).

Finally, as the process model in Fig. 1 suggests, neodissociation theories serve as an important source of hypotheses about the possible neural bases underling hypnosis and other dissociative phenomena. Such neural models of hypnosis are another very active current area of research (e.g., Jamieson and Woody 2007).

References

Bowers, K. S. (1992). Imagination and dissociation in hypnotic responding. *International Journal of Clinical and Experimental Hypnosis, 40*, 253–275.

Hilgard, E. R. (1977). *Divided consciousness: Multiple controls in human thought and action*. New York: Wiley.

Jamieson, G. A., & Woody, E. Z. (2007). Dissociated control as a paradigm for cognitive-neuroscience research and theorising in hypnosis. In G. A. Jamieson (Ed.), *Hypnosis and conscious states: The cognitive-neuroscience perspective* (pp. 111–129). Oxford: Oxford University Press.

Janet, P. (1907). *The major symptoms of hysteria*. New York: Macmillan.

Kihlstrom, J. F. (1992). Hypnosis: A sesquicentennial essay. *International Journal of Clinical and Experimental Hypnosis, 50*, 301–314.

Kirsch, I., & Lynn, S. J. (1998). Dissociation theories of hypnosis. *Psychological Bulletin, 123*, 100–115.

Norman, D. A., & Shallice, T. (1986). Attention to action: Willed and automatic control of behavior. In R. J. Davidson, G. E. Schwartz, & D. Shapiro (Eds.), *Consciousness and self-regulation* (Vol. 4, pp. 1–18). New York: Plenum Press.

Terhune, D. B., & Cardeña, E. (2015). Dissociative subtypes in posttraumatic stress disorders and hypnosis: Neurocognitive parallels and clinical implications. *Current Directions in Psychological Science, 24*, 452–457.

Woody, E. Z., & Bowers, K. S. (1994). A frontal assault on dissociated control. In S. J. Lynn & J. W. Rhue (Eds.), *Dissociation: Clinical and theoretical perspectives* (pp. 52–79). New York: Guilford Press.

Woody, E., & Sadler, P. (1998). On reintegrating dissociated theories: Comment on Kirsch and Lynn (1998). *Psychological Bulletin, 123*, 192–197.

Woody, E. Z., & Sadler, P. (2008). Dissociation theories of hypnosis. In M. Nash & A. J. Barnier (Eds.), *Oxford handbook of hypnosis: Theory, research and practice* (pp. 81–110). Oxford, UK: Oxford University Press.

Neo-Freudians

Tim Marsh
Department of Psychology, New York University-Sydney, Sydney, Australia

Synonyms

Neo-Adlerians; Neo-psychoanalysts; Post-Freudians

Definition

The term "Neo-Freudian" is routinely used in subtly different ways by those intimately familiar with the minutia of psychoanalysis (often used to group together one specific academic lineage) than by general commenters on the history of psychology (who use the term broadly to describe any dissenting heirs to Freud's work).

When speaking in the broad sense, a "Neo-Freudian" is any theorist or psychoanalyst whose initial education or work was grounded in Sigmund Freud's theory, but which later made a conspicuous departure from the Freudian model, most commonly in the form of resisting the purported role of infant psychosexuality or in expanding the role of social and cultural factors in the formation of personality. By this definition, many of the most famous Neo-Freudians were students and contemporaries of Freud, who departed his company on grounds of theoretical dissent, such as Alfred Adler and Carl Jung.

When speaking in the narrow sense, the "Neo-Freudians" were a tradition of mostly American psychiatrists and psychologists in mid-twentieth century, many of whom based their work in some aspects of Freud's original theories, but continued in Adler's direction of variously expanding, updating, or replacing biologically innate elements of Freud's theories with social or cultural influences. By this definition, theorists such as Karen Horney and Harry Stack Sullivan are some of the quintessential Neo-Freudians.

Introduction

Few schools of thought can claim to have exerted as broad an influence on the history of psychology as Sigmund Freud's psychodynamic theories and associated techniques of psychotherapy (Stevens 1989). While an unbroken intellectual tradition, dating back to Freud's original Vienna institute, has maintained and applied the unaltered central tenets of Freudian psychoanalytic therapy to this day (Pick 2015), much of Freud's influence on psychology can be found among the splinter traditions that took key psychodynamic insights in different directions. Even more so than those movements within psychology that defined themselves in part as reactions to perceived shortcomings in Freud's approach (Stevens 1989), several areas within clinical and personality psychology can trace a direct intellectual lineage back to Freud as their unambiguous common ancestor.

Some traditions elected to cast themselves as alternative schools of psychoanalytic thought, organized around geographical hubs distant from Vienna, such as the British psychoanalysts Christopher Bollas, Adam Phillips, and Donald Winnicott (Brown 1964). Others extracted specific psychodynamic concepts, and sought to expand their application within particular domains of human experience, as was the case with Heinz Kohut, Melanie Klein, and Otto Kernberg, with their cumulative development of what has come to be called Objects Relations Theory (Greenberg and Mitchell 1983), a model of caregiving relationships that acted as a conceptual predecessor of Bowlby's later theories of attachment (Shaver and Mikulincer 2008). Others still built upon the core psychodynamic distinctions of Id, Ego, and Superego to forge new theories concerning the reactive development of personality, a tradition now referred to as Ego Psychology, influenced largely by the contributions of Heinz Hartmann and David Rapaport (Malcolm 1982), who in turn were building upon the expanded conception of defense mechanisms developed by Anna Freud (Padel 1987). All of these traditions can be seen as offshoots of Freud's theories, what some writers have called post-Freudian schools of thought (Brown 1964), defined largely by the repurposing of Freudian concepts to a new, usually broader task.

In contrast, some conceptual descendants of Freudian Psychodynamics are noteworthy for not merely repurposing Freud's theories, but for openly contesting some elements of the accepted Freudian models in favor of alternative concepts of their own devising. These dissenting theorists, or at least a noteworthy subset of them, are today collectively referred to as the Neo-Freudians (Brown 1964). Though some of the aforementioned figures are considered Neo-Freudians by some, the term represents less of a singular, coherent intellectual movement, and more of a

retroactively useful grouping of theorists who dissented from the Freudian canon for similar reasons (Birnbach 1961).

Who Counts as a Neo-Freudian?

In *A Critical Dictionary of Psychoanalysis*, Rycroft collectively refers to the Neo-Freudians as "American writers who attempted to restate Freudian theory in sociological terms and to eliminate its connections with biology" (Rycroft 1968, p.60). However glib a summary this definition is of the diverse of origins, motives, and perspectives of the various Neo-Freudian theorists, it nonetheless summarizes the broad themes commonly associated with the Neo-Freudians. Merely dissenting from Freud's specific beliefs and theoretical positions is not enough to be considered a Neo-Freudian, nor is being one of the many influential psychoanalysts of the early twentieth century who were either native to or immigrated to the United States of America. Rather, the uniting feature most heavily relied upon to categorize the Neo-Freudians was the character of their dissent from Freud's views, particularly with regards to the role of social and cultural factors in shaping personality (Birnbach 1961).

Contrary to the clear motive stated in Rycroft's definition, the most prominent Neo-Freudians could not reasonably be interpreted as seeking to "eliminate" the connections to biology present in Freud's theories, but rather, to distance their own theories from Freud's particular conception of instinctual drives as intimately related to infant sexuality (Kurzweil 1989). Most of the theorists now thought of as Neo-Freudians who were close contemporaries of Sigmund Freud debated this conception of instinctual drives with him directly, seeing it as an overinterpretation of what they saw as a broader phenomenon biologically grounding psychological motives (Birnbach 1961). The degree and precise character of these challenges varies from theorist to theorist, but the broad trend could be characterized as an attempted move away from an alienating and deterministic conception of our innate psychological endowments, while instead offering greater explanatory weight to matters of social experience and interpersonal conflict (Frosh 1999). The assertions of Freud's radically embodied libidinal drives in children were seen as far from matters of certainty, and served as by far the most common point of departure that Neo-Freudian theorists sought to reimagine in terms of socialization (Brown 1964).

Beyond this largely shared avenue of dissent from the Freudian orthodoxy, a subset of Neo-Freudian writers and therapists shared overt institutional ties, mostly involving centers of psychiatric training such as the William Alanson White Institute in New York, founded in part by influential Neo-Freudian thinkers in 1946 (Frosh 1999). American institutions of this sort represent the closest that Neo-Freudianism has come, as a whole, to perpetuating itself as an earnest intellectual tradition, as they represent lineages of teaching and inspiration often leading back to figures like Alfred Adler, by way of Harry Stack Sullivan or Erich Fromm (Birnbach 1961). They are, however, the exception and not the rule, as the most prominent of Neo-Freudian thinkers generally offer sufficiently unique theoretical perspectives that their only substantial overlaps with each other are the unmodified inheritance of Freud's original theories. This difficulty in pinning down a stable shared character for all theorists labeled as Neo-Freudians is largely responsible for the disagreements between historians of psychology as to who should or should not be included in the category (Brown 1964). The term itself takes on a different meaning if one is attempting to cast the Neo-Freudians as a distinct tradition (as in Rycroft's definition, 1968), or as a diverse cluster of writers and analysts grouped together solely by the character of their dissent from Freud's views (as in Kurzweil 1989).

For the purposes of this brief article, individual attention will be paid primarily to the four most prominent theorists who are regarded as Neo-Freudians, in that they notably splintered from Freud's teachings in order to pursue theories more centered around social influences on personality: Alfred Adler, Karen Horney, Carl Jung, and Erik Erikson. Prior to this, however, this article will quickly touch on several key figures who are also commonly regarded as Neo-Freudians and who, while less distinctly

influential than the proceeding four, have helped shape the face of Neo-Freudianism as it is now remembered, namely, Erich Fromm, Otto Rank, and Henry Stack Sullivan.

Peripheral Neo-Freudians

Erich Fromm

Erich Fromm was a German-born theorist who, while trained as a psychoanalyst and heavily influenced by Freud, was also heavily influenced by the works of Karl Marx (Fromm 1980). Fromm was a prominent member of the Frankfurt School, where he reimagined the psychodynamic conception of anxiety as being explicitly generated by the social conditions of modernity, a notion that was influential in the development of the more modern psychological and political concept of "alienation" (Friedman 2013). Fromm postulated that many attempt to cope with this anxiety by "escaping freedom," a maladaptive psychological process that could take on one of four key "orientations" (akin to defense mechanisms): The Receptive Orientation, The Exploitative Orientation, The Hoarding Orientation, and the Marketing Orientation (Fromm 1980). Under favorable social conditions, thought to require Communalistic Humanitarian Socialism, Fromm postulated it was possible to convert any of these orientations into a fifth, Productive Orientation, but that social pressures largely stalled this prospect in peoples' lives. Fromm was a close contemporary with other Neo-Freudians Harry Stack Sullivan and Karen Horney, and served alongside Sullivan as one of the founders of the William Alanson White Institute (Birnbach 1961).

Otto Rank

Otto Rank was an Austrian-born psychotherapist who was a close associate of Freud's for some 20 years (James 1985). After leaving Austria, he focused his career primarily on lecturing in France and the United States, but continued to write his own Neo-Freudian contributions to psychoanalytic theory, focused largely on the nature of the therapeutic relationship, and how he believed it could foster both the learning of adaptive behavior patterns and the targeted "unlearning" of behaviors that sustained neuroses (Kramer 1995). He also departed from Freud's account of neuroses as being grounded in repressed impulses, and instead viewed them as failures of creativity in conceiving of one's own ideal behaviors based on social experience (James 1985). His theories also cast a larger social role for the key conflicts of life, which Rank characterized as "separations," a concept he closely tied to his model of "unlearning" undesirable behaviors of dependence. This work was highly influential of the later emerging field of Existential Psychotherapy, largely through the impact his American lectures had on Rollo May (James 1985).

Harry Stack Sullivan

Harry Stack Sullivan was a key figure in American psychoanalysis, particularly among the traditions that sought to depart from or build upon the Freudian orthodoxy (Mullahy 1952). While not as influential as his colleague, Karen Horney, Sullivan made many personal contributions to the American attempts to integrate insights of social psychology into psychodynamics. Notably, Sullivan's accounts of personality relied upon a relational concept he referred to as a "dynamism," which was analogous to what a habit or trait represents in many other theories, but was postulated to not exist within an individual person, but rather between a person and a recurring situation they find themselves in (Mullahy 1952). Through concepts such as the dynamism, Sullivan, more so than many other Neo-Freudians, sought to undermine the central position of instincts and drives in psychodynamic thought, instead insisting upon the inescapably "culture-ridden" nature of every aspect of personality (Sullivan 1972). To this end, Sullivan also revised the Freudian conception of the self-image, insisting instead on "personifications," mental representations that function in a manner akin to stereotypes, but generally held by one person about a specific other person or themselves (e.g., personifications of one's mother may include Good Mother, Bad Mother, Seductive Mother, or Overprotective Mother) (Mullahy 1952). As with his colleague Karen Horney, and to a lesser extent Erich Fromm, Sullivan has been identified as a

theorist whose engagement with Freudian theory appear to be largely shaped by the earlier dissenting words of Alfred Adler, prompting some commenters (Birnbach 1961) to suggest that Sullivan and Horney may be better regarded as "Neo-Adlerians," as opposed to Neo-Freudians in full.

Alfred Adler

Although, like Jung, he never came to settle permanently in the United States, Alfred Adler is generally the most agreed upon member of the Neo-Freudians, regardless of which criteria one is employing (Birnbach 1961). Adler was among the first of Freud's major followers to declare his public dissent from Freud's views, parting from Freud's circles in 1911 (Fiebert 1997). As would prove a recurring theme among later dissenters, Adler disagreed with Freud's particular interpretation of innate instinctual drives as embodied infant sexual desire, a position that writers such as Frosh (1999) attribute at least partially to political considerations for how distasteful the concept appeared to laypeople. This disagreement did not constitute an indictment of the significance of childhood to personality development, or indeed to the existence of innate motivational states, as Adler's subsequent theories still rely extensively on both of these aspects of psychoanalysis (Fiebert 1997).

In adjusting his views away from those of Freud, Adler sought to place a greater emphasis on what he called "Social Interest," the notion that in addition to their selfish, libidinal desires for gratification, that the human mind also possesses a fundamental yearning to see others thrive, driving us to advance social welfare (Adler 1958). This more optimistic view of human nature, in contrast to Freud's relatively tragic view, was reflected in multiple aspects of Adler's theories, including the presumed unknowability of our own minds. In Adler's models, the conceptual equivalent of Freud's unconscious drives were various "goals" that, while generally unconscious, were in principle far more knowable and plausible to consciously engage with than much of Freud's Id (Fiebert 1997). Students of Adler's theories disagree over the intended metaphysical status of these "goals," but many interpret them as possessing a teleological quality that ties in closely with Adler's emphasis on striving, as contrasted with the private avarice of the Freudian unconscious (Adler 1958).

In framing his own notions of the human propensity for development and self-improvement, Adler regarded "Striving for Superiority" as a fundamental yearning in human psychology, wherein each individual seeks to overcome the limitations they see within themselves (Adler 1958). This concept appears to be grounded, at least in part, within Adler's own autobiographical history, having reportedly struggled with both illness and injuries himself in childhood (Fiebert 1997). This personal striving operates in relation to Adler's most famous theoretical contribution to modern psychology, the concept of the "Inferiority Complex," one's semiconsciously maintained catalogue of both real and imagined personal deficiencies, the intensity and character of which serves as the ultimate motivation for one's Striving for Superiority (Adler 1958). In Adler's terminology, the habitual mode of striving one develops in childhood and maintains throughout their life is referred to as their "Style of Life" or simple "Life Style," which is taken to be one of the most defining characteristics of individual personality. While he expressed a distaste for personality typologies, he did offer tentative expressions of Life Styles that could be broadly observed: the Getting/Leaning, the Avoiding, the Ruling/Dominant, and the Socially Useful (Adler 1958). Adler was also one of the first theorists to suggest that socialization differences relating to birth order may have substantial influence on how these Styles express (Fiebert 1997).

As part of the expanded role of social experience in his theories, Adler also identified what he believed to be the three fundamental tasks of social life: Occupational Tasks (pertaining to one's career), Societal Tasks (pertaining to friendships and camaraderie), and Love Tasks (ideally finding an intimate partner for a long-term relationship). The necessity in cooperation in each of these tasks underscored Adler's central emphasis on interpersonal care and concern with the welfare of others (Fiebert 1997). Owing to his insistence on considering the whole individual

rather than a piecemeal conception of personality, Adler's intellectual tradition was often referred to as "Individual Psychology" (Birnbach 1961).

Karen Horney

Despite not overtly objecting to the emphasis Freud placed on infant sexuality to the same degree as many other Neo-Freudians, Karen Horney famously challenges many aspects of Freud's model of psychosexual development on the grounds that they represented presumed differences of value between the genders that appeared to be inferences grounded in Freud's personal antifemale biases (Quinn 1987). Specifically, Horney viewed psychosexual concepts such as "Penis Envy," a young girl's presumed self-evident acknowledgement that boys are in the better sexual position and wishing she had a penis herself, as sexist "biological fallacies" that could only seem self-evident to a man (Horney 1959). To this end, Horney offered the famous rejoinder that from her perspective, a far stronger argument could be made that boys should feel obvious inadequacy when confronted with the capacities of the female body to host and birth new life, going so far as to imply that young boys ought to then experience "Womb Envy" (Horney 1967). Her role in challenging these gendered assertions, in addition to her lauded position as one of the first women ever trained to be a Freudian psychoanalyst, prompt some writers to christen her a founder of the nascent area of Feminist Psychology (Quinn 1987).

As was the case with Adler before her, Horney's main alterations to classical Freudian psychodynamic theory largely revolved around expanding the role of social experience and social influences, in part to fill the explanatory gaps left by those elements of Freud's theories she deemed untenable. For example, Horney drew specific attention to the proposed issue of Penis Envy, suggesting that envy-like patterns of anxiety that appear unique to girls are more likely to draw from their exposure to the greater social privileges afforded to boys and men, relative to girls and women, thus replacing Freud's biological and reductive explanation with one drawn from inequalities in socialization (Horney 1959). Beyond her reinterpretations of gendered phenomena, Horney also advanced a social conflict-based reinterpretation of the role anxiety plays in psychological life, suggesting that social experiences of isolation and helplessness in a seemingly hostile world produce a basic sense of generalized anxiety that individuals must cope with, in contrast to the drive-specific anxieties outlined by Freud (Quinn 1987). Since this conception of basic anxiety is entirely social in nature, Horney proposed that the coherent coping strategies must be social as well, and thus defined three social coping styles that individuals may adopt in childhood, strongly shaping their subsequent personality (Horney 1959):

1. "Moving Toward Others," wherein individuals accept the anxiety of their situation and become dependent on others
2. "Moving Against Others," resorting to aggression as a means of resisting the situation, potentially directing that aggression towards others who can be subverted or exploited for personal gain
3. "Moving Away From Others," wherein individuals reduce their social anxieties by becoming isolated and withdrawing from others, often appearing in one's personality as an exaggerated need for independence, self-sufficiency, or privacy

In a manner similar to, though arguably more pronounced than, Adler's optimistic theories of personal striving, the social dimensions of Horney's theories are distinctly optimistic and life-affirming in a manner that sharply contrasts the tormented human nature of Freud's theories (Horney 1959). In this regard, Horney was also in agreement with Jung, suggesting that since positive change is possible through introspection and auditing one's neuroses, the main goal of psychoanalysis should be to help individuals become globally healthier selves, rather than exhaustively exploring patterns of childhood dysfunction (Horney 1959). These particular life-affirming elements of Horney's theories and writings served to influence later generations of psychologists who were concerned with improving lives and

self-actualization. Most notably, Horney had a substantial influence on Carl Rogers, the founder of what is today most commonly called Humanistic Psychology or Person-Centred Psychotherapy, during his younger years when he was training as a psychoanalyst (Quinn 1987).

Carl Jung

Arguably the most widely known of Freud's friends and protégés who eventually parted ways with his psychoanalytic approach, Carl Jung is sometimes excluded from lists of Neo-Freudian theorists that focus heavily on the American intellectual tradition associated with Adler, Horney, and Sullivan (Brown 1964; Kerr 1993). His classification as a Neo-Freudian hinges largely on the thematic parallels between his dissents from Freud's views and those of other theorists who sought a larger role for social influences in psychodynamic thinking (Birnbach 1961). In 1912, less than a year after Adler's public break from Freud's tradition, social friction between Jung and Freud finally resulted in Jung openly disagreeing with Freud's conception of the unconscious in his subsequent American lecture series, later published as *The Theory of Psychoanalysis* (Jung 2012). Much like both Adler and Horney, Jung resisted Freud's particular framing of libido as unfolding childhood sexuality, believing that while libidinal drives of a sort do exist, that they do not hold the central and deterministic influence on personality development that Freud attributed to them (Hayman 1999). True to the overarching pattern of Neo-Freudian dissent, there were specific domains of social influence that Jung believed Freud's theory fundamentally neglected or mischaracterized, though some social phenomena were of unique interest to Jung, most notably religious experience and one's relationship to mythology, which Jung believed Freud's approach wrongfully trivialized (Jung 1971).

The most striking conceptual difference between Jung's theories and those of Freud, or for that matter between Jung and his fellow Neo-Freudians, is Jung's approach to the unconscious. Like all heirs to Freud's psychodynamic insights, Jung believed in a personal unconscious mind, the largely unknown or unknowable greater share of an individual's mind, from which an individual's rudimentary impulses and unacknowledged thoughts arise, and whose secrets may at times be partially accessed through efforts of association, therapeutic guidance, or the analysis of dreams (Kerr 1993). To Jung, however, an individual's Personal Unconscious is not an isolated intrapersonal phenomenon, but rather is connected to (or perhaps part of) a larger shared conceptual space that acts as a repository of the crucial reoccurring desires, thoughts, memories, and themes of all of humanity, past, and present, what Jung called the "Collective Unconscious" (Jung 1960). The postulated existence of the Collective Unconscious endowed Jung's psychoanalytic theories with a unique channel for social influence and shared experience, since in his view we were capable of not only learning social information from others, but we could also recognize in the behavior of others particular expressions of ideas we all draw from the Collective Unconscious (Jung 1960). While many regard the Collective Unconscious as an inherently mystical or supernatural concept, particularly since Jung was extensively interested in shared mythologies and the transmission of religious symbols, it is essential to note that Jung's views were largely pantheistic, identifying spiritual experience as an aspect of general experience, rather than explicitly committing to a metaphysics that postulated separate supernatural forces (Hayman 1999). Jung did not concern himself with the mechanisms of the Collective Unconscious, considering the concept to be compatible with explanations as diverse as unconscious telepathy, a species-memory hidden within our biology, or simply shared patterns in our biological inheritance owing to the lost details of evolution (Jung 1960). The primary manifestation of the Collective Unconscious, in Jung's view, were in what he described as "Archetypes," recurring concepts, themes, and narratives that he observed independently repeating themselves, both in the geographically distant cultures of the world but also in the particular life struggles of those he interviewed (Jung 1960).

In contrast to Freud's emphasis on coping with the innately flawed nature of human mental life, Jung demonstrated a similar optimism to many

other Neo-Freudian thinkers, and saw among the Archetypes he studies an overarching tendency towards personal transformation, which he called "Individuation," a process honoring both the conscious and unconscious mind that he took to be the spiritual core of all major religious traditions (Jung 1960). While Freud's view led him to be skeptical of religious experience and its purported benefits, Jung regarded much of religious practice as a set of social tools that have emerged to guide Individuation in different cultural settings (Kerr 1993). This view naturally informed Jung's opinions on how best to apply psychotherapy to those struggling to find meaning in their lives, and has proven highly influential to some schools of thought in the psychology of religion, particularly with regards to taking personal inspiration from the narratives of religious texts (Hayman 1999).

Jung's greater appreciation of social influences, both inclusive of and independent of the proposed role of the Collective Unconscious, also shaped this views on various coping strategies, particularly in social domains. To this end, Jung developed the concept of what he called the "Persona," a figurative mask that we performatively assume in order to superficially match the expectations we sense our social context demands of us (Jung 1983). Each Persona, while often sharing Archetypical characteristics, is unique, since Jung characterized a Persona as being a protective compromise between the standards demanded by society and one's hidden "True Self" (Jung 1983). The concept collected and simplified many elements of interpersonal tension that Freud addressed as defense mechanisms, since the adaptive function of the Persona was to hide from others, and in part oneself, those aspects of our True Self that we know would be judged harshly or rejected, which Jung sometimes referred to as the "Shadow" (Jung 1971). In addition to the influence of one's Persona and concealed Shadow on their personality, Jung's theories of personality (the foundation of the tradition called Analytical Psychology) also adopted a functional approach to how the psyche organizes its experience of the world. Jung subcategorized psychological experience into four basic functions: Sensation, Intuition, Thinking, and Feeling (Jung 1971). Within each of these functional domains, Jung specified that each person will manifest one of two possible dispositional temperaments, or Personality Types, which labeled as Extraversion, a predominant concern with the features of the outside world and social interactions, and Introversion, a predominant concern with one's own mental activity and the maintenance of internal states (Jung 1971). While these terms have come to be highly popular and influential in trait approaches to personality, it bears mentioning that contemporary continuum models of Introversion-Extraversion are conceptually far-removed from Jung's own usage (Hayman 1999).

Erik Erikson

Like Jung, Erik Erikson is sometimes not regarded as a Neo-Freudian, owing to a combination of his distance from the key American institutions of the movement and his own great prominence for his unique theories and contributions as a developmental theorist (Welchman 2000), but like Jung, the direction and character of his dissent from the main Freudian tradition make his relevance clear. Unlike many of the other Neo-Freudians, Erikson's relation to the Freudian psychodynamic tradition came mostly through Anna Freud, Sigmund Freud's youngest daughter and fellow psychoanalyst and personality theorist, who had personally performed psychoanalysis on Erikson (Welchman 2000). Having approached the Freudian community mostly during the final decade of Freud's life, at Anna Freud's suggestion, Erikson obtained his full diploma from the Vienna Psychoanalytic Institute in 1933, though he also completed studies in Montessori education, reflecting that Erikson's primary interests lay with the processes of childhood development more so than a desire to practice psychotherapy on adults (Welchman 2000). With the coming of World War II, Erikson and his family emigrated from Germany to the USA, where he began work as child psychologist and to expand his theories of development and identity beyond Freud's teachings (Welchman 2000). Like other Neo-Freudians before him the central thrust of Erikson's disagreements with the

Freudian tradition centered on the role childhood sexuality played in development, with Erikson particularly rejecting Freud's insistence that key elements of personality and identity become fixed by childhood psychosexual experience and remain stable for much of the rest of an individual's life (Erikson 1997).

Erikson saw a larger role for social forces in development, appreciating Freud's overall model of formative conflicts and their resolutions, but instead suggesting that these defining conflicts were generally social by nature, and that rather than occurring in lock-step with physical developmental milestones leading up to puberty, that individuals continued to face formative social conflict for most of their lifespan (Erikson 1997). In focusing on the development of the self as relative to and in reaction to social and environmental influences, Erikson's early personality work was concerned mainly with what he called "Ego Identity," an individual's sense that there are aspects of themselves that are preserved and continuous across the various changes of development, and which forms the basis for one's enduring meaning in the lives of others (Erikson 1979). Erikson's Ego Identity work was highly influential to the burgeoning Ego Psychology, mentioned above as being largely championed by figures like Heinz Hartmann and David Rapaport (Malcolm 1982). In his broader developmental theories, Erikson typically regards the central conflict of any given life stage as potentially exerting and enormous influence on one's Ego Identity, or how one maintains personal definition in the face of wildly shifting social roles and relationships (Erikson 1979).

By far, Erikson's most influential contribution to psychology at large has been his theory of life-long psychosocial personality development (Erikson 1997). Erikson initially based his theory in the stages of Freud's psychosexual theory of personality development, but came to extract most of the distinctly embodied and instinctual components, instead reinterpreting each stage purely in terms of the central social conflict whose resolution will shape the individual's Ego Identity (Erikson 1979). Much like Freud's approach, each stage holds the potential for being resolved in both adaptive and maladaptive ways that will subsequently shape one's personality in profound ways, though unlike Freud's, Erikson's stages are framed more distinctly as "tasks" that must be negotiated successfully in order to continue healthy, typical development (Erikson 1997). Erikson proposed eight stages in total, distributed broadly across the lifespan:

1. Hope – Basic Trust versus Basic Mistrust	0–18 months
2. Will – Autonomy versus Shame	1–3 years
3. Purpose – Initiative versus Guilt	3–6 years
4. Competence – Industry versus Inferiority	6–11 years
5. Fidelity – Identity versus Role Confusion	12–18 years
6. Love – Intimacy versus Isolation	18–35 years
7. Care – Generativity versus Stagnation	35–64 years
8. Wisdom – Ego Integrity versus Despair	65 years and onward

Of the many possible trajectories of personality development one might take under Erikson's theories the concepts that have gained the most traction and influence in the contemporary West are his notion of an "Identity Crisis," resulting from failure to maintain Ego Identity through adolescence, and the value of the Generativity versus Stagnation theory in explaining the folk concept of a "mid-life crisis" (Erikson 1997). While Erikson's great contributions are often regarded as their own branch of developmental psychosocial theory, the structure of his stages and the potential neuroses said to accompany failures to preserve one's identity show the tell-tale signs of Erikson's extensive Freudian roots.

Conclusion

Whether one is employing a broader or narrower definition of the term, the uniting theme among all theorists who are classed as Neo-Freudians is an aim to expand Freud's original theories with some greater consideration of social or cultural influence. While this desire has been derided by some (see Rycroft 1968) as motivated by a perhaps unscientific aversion to the less palatable workings of biology, the sheer diversity of Neo-Freudian approaches may suggest that some

social arenas were conspicuously underdeveloped in Freud's writings, at least relative to the growth seen in the social sciences by mid- and late twentieth century.

Cross-References

- Analytical Theory (Jung)
- Anima/Animus
- Archetypes
- Basic Anxiety (Horney)
- Collective Unconscious
- Drive Theory
- Individual Psychology (Adler)
- Instincts and Tension Reduction
- Interpersonal Theory of Psychiatry (Sullivan)
- Moving Against People
- Moving Away from People
- Moving Toward People
- Neurosis
- Persona (Jung)
- Personal Unconscious
- Psychoanalysis
- Psychodynamic Perspective
- Psychosexual Stages of Development (Freud)
- Psychosocial Stages of Development (Erikson)
- Shadow
- Striving for Superiority

References

Adler, A. (1958). *Social interest: A challenge to mankind*. New York: Capricorn.

Birnbach, M. (1961). *Neo-Freudian social philosophy*. Stanford: Stanford University Press.

Brown, J. A. C. (1964). *Freud and the post-Freudians*. Harmondsworth: Penguin.

Erikson, E. H. (1979). *Dimensions of a new identity: The Jefferson lectures in the humanities*. New York: W. W. Norton.

Erikson, E. H. (1997). *The life cycle completed. extended version with new chapters on the ninth stage of development by Joan H. Erikson*. New York: W. W. Norton.

Fiebert, M. S. (1997). In and out of Freud's shadow: A chronology of Adler's relationship with Freud. *Individual Psychology, 53*(3), 241–269.

Friedman, L. J. (2013). *The lives of Erich Fromm: Love's prophet*. New York: Columbia University Press.

Fromm, E. (1980). *Beyond the chains of illusion: My encounter with Marx & Freud*. London: Sphere Books.

Frosh, S. (1999). *The politics of psychoanalysis: An introduction to Freudian and post-Freudian theory*. New York: New York University Press.

Greenberg, J., & Mitchell, S. (1983). *Object relations in psychoanalytic theory*. Cambridge, MA: Harvard University Press.

Hayman, R. (1999). *A life of Jung*. New York: W. W. Norton.

Horney, K. (1959). *Neurosis and human growth*. New York: Norton.

Horney, K. (1967). In H. Kelman (Ed.), *Feminine psychology*. New York: W. W. Norton.

James, L. E. (1985). *Acts of will: The life and work of Otto Rank*. New York: Free Press.

Jung, C.G. (1960). Psychology and Religion. In H. Read (Ed.), *The collected works of C.G. Jung* (trans: R. F. C. Hull.). Princeton: Princeton University Press.

Jung, C. G. (1971). Psychological types. In W. McGuire (Ed.), *The collected works of C. G. Jung* (Vol. 6, Bollinger series XX). Princeton: Princeton University Press.

Jung, C.G. (1983). The development of personality (trans: R. F. C. Hull,). In A. Storr (Ed.), *The essential Jung* (pp. 191–209). Princeton: Princeton University Press.

Jung, C. G. (2012). *Jung contra Freud: The 1912 New York lectures on the theory of psychoanalysis*. Princeton: Princeton University Press.

Kerr, J. (1993). *A most dangerous method: The story of Jung, Freud, and Sabina Spielrein*. New York: Knopf.

Kramer, R. (1995). The birth of client-centered therapy: Carl Rogers, Otto Rank, and 'The Beyond'. *Journal of Humanistic Psychology, 35*, 54–110.

Kurzweil, E. (1989). *The Freudians: A comparative perspective*. New Haven: Yale University Press.

Malcolm, J. (1982). *Psychoanalysis: The impossible profession*. London: Picador.

Mullahy, P. (1952). *The contributions of Harry Stack Sullivan: A symposium on interpersonal theory in psychiatry and social science*. New York: Hermitage House.

Padel, J. H. (1987). Freudianism: later developments. In R. L. Gregory (Ed.), *The Oxford companion to the mind*. New York: Oxford University Press.

Pick, D. (2015). *Psychoanalysis: A very short introduction*. New York: Oxford University Press.

Quinn, S. (1987). *Mind of her own: The life of Karen Horney*. New York: Summit Books.

Rycroft, C. (1968). *A critical dictionary of psychoanalysis*. London: Thomas Nelson.

Shaver, P. R., & Mikulincer, M. (2008). Augmenting the sense of security in romantic, leader-follower, therapeutic, and group relations: A relational model of personality change. In J. P. Forgas & J. Fitness (Eds.), *Social relationships: Cognitive, affective, and motivational processes* (pp. 55–73). New York: Psychology Press.

Stevens, R. (1989). *Freud and psychoanalysis*. Milton Keynes: Open University Press.

Sullivan, H. S. (1972). *Personal psychopathology*. New York: W.W. Norton.

Welchman, K. (2000). *Erik Erikson: His life, work, and significance*. Philadelphia: Open University Press.

Neo-psychoanalysts

► Neo-Freudians

Neria, Yuval

Yuval Neria
Columbia University Medical Center, New York, NY, USA

Yuval Neria PhD is Professor of Medical Psychology at Columbia University, Departments of Psychiatry and Epidemiology, and Director of Trauma and PTSD at the New York State Psychiatric Institute (NYSPI). Dr. Neria's research has been focused on the mental health consequences of exposure to extreme traumatic events among high-risk populations including war veterans, disaster survivors, and patients with severe mental illness. He has been particularly interested in the role of personality traits, environmental factors, and neural signatures in the development and maintenance of psychiatric conditions including posttraumatic stress disorder, depression, generalized anxiety, bipolar illness, and borderline personality disorder. In addition, Neria has been involved in developing and testing novel, neuroscience-informed treatments for PTSD and in identifying biomarkers of PTSD and treatment outcome for patients with PTSD. Dr. Neria's research studies were funded by the National Institute of Mental Health (NIMH), NARSAD, and private foundations since 2002. Currently, his lab is using functional magnetic resonance imaging (fMRI) and a number of novel paradigms to identify brain and behavioral markers of deficient fear conditioning and extinction learning in PTSD and to probe for the first time biomarkers of clinical improvement in response to PTSD treatments. Dr. Neria has authored more than 170 articles and book chapters and edited 4 books.

Early Life and Educational Background

Dr. Neria grew up in Israel and at the age of 18 joined the Israeli army and subsequently participated in the 1973 Yom Kippur War and the 1982 Lebanon War. He was injured in the Yom Kippur War and at the age of 22 was awarded the Medal of Valor, the highest decoration for combat bravery in Israel. Neria's political views and body of work were deeply influenced by his war experiences. Dr. Neria graduated philosophy and political science from Hebrew University in Jerusalem and completed his PhD in psychology at the University of Haifa, Israel. Following his doctorate studies, he received the Alon Award from Tel Aviv University and was on its faculty until his recruitment to Columbia University, Departments of Psychiatry and Epidemiology (2002).

Research Interests

1. **The long-term emotional consequences of extreme exposure to trauma**. To identify the long-term emotional consequences of extreme exposure to trauma, Dr. Neria conducted the largest study to date among Israeli prisoners of wars almost two decades after release from captivity. Findings indicate that the consequences of war captivity are more severe than those of war trauma, and they are wide ranging and disabling even decades after the trauma.
2. **The role of trauma exposure in first-onset psychosis**. While working with Dr. Evelyn Bromet, a psychiatric epidemiologist at Stony Brook University (1999–2000), Dr. Neria has analyzed data collected as part of NIMH studies (Bromet, PI) among patients with first-onset psychosis, demonstrating that exposure to trauma has the potential to increase risk of not only PTSD but also schizophrenia, depression, and bipolar illness.
3. **The role of personality traits in trauma-related psychopathology**. Focusing on various samples of people exposed to extreme trauma, Dr. Neria and his colleagues were

able to demonstrate the key role personality plays in developing and maintenance trauma-related psychopathology.

4. **The effect of 9/11 attacks on low-income primary care population in New York City**. In a longitudinal RO1 study funded by NIMH, Dr. Neria followed a large cohort of low income primarily immigrant cohort 1 and 4 years after 9/11 attacks. The findings have shown a particular risk in this population for a host of disorders including PTSD, depression, bipolar illness, GAD, functional impairment, and suicidal ideation.
5. **Neural signature of trauma and biomarkers of PTSD**. Funded by NIMH, Dr. Neria has led two RO1 studies aiming to identify the neural signature of trauma and biomarkers for diagnosis and treatment response in PTSD. Since most tools to date are based on self-report, these studies, applying a range of neuroimaging and genetic methods, have the potential to significantly contribute to our understanding of the trauma-related neural impairments, the neurobiology of PTSD, and its treatment.

Selected Bibliography

Besser, A., & Neria, Y. (2010). The effects of insecure attachment orientations and perceived social support on posttraumatic stress and depressive symptoms among civilians exposed to the 2009 Israel-Gaza war: A follow-up cross-lagged panel design study. *Journal of Research in Personality, 44*, 335–341. https://doi.org/10.1016/j.jrp.2010.03.004.

Besser, A., Neria, Y., & Haynes, M. (2009). Adult attachment, perceived stress, and PTSD among civilians exposed to ongoing terrorist attacks in southern Israel. *Journal of Personality and Individual Differences, 47*, 851–857. https://doi.org/10.1016/j.paid.2009.07.003.

Besser, A., Zeigler-Hill, V., Pincus, A. L., & Neria, Y. (2013). Pathological narcissism and acute anxiety symptoms: A study of Israeli civilians exposed to war trauma. *Psyhciatry, 6*, 381–397. https://doi.org/10.1521/psyc.2013.76.4.381.

Helpman, L., Papini, S., Chhetry, B. T., Shvil, E., Rubin, M., Sullivan, G. M., Markowitz, J. C., Mann, J. J., & Neria, Y. (2016). PTSD remission after prolonged exposure treatment is associated with anterior cingulate cortex thinning and volume reduction. *Depression and Anxiety, 33*(5), 384–391. https://doi.org/10.1002/da.22471.

Neria, Y., & Shultz, J. M. (2012). Mental health effects of hurricane sandy: Characteristics, potential aftermath, and response. *JAMA, 308*(24), 2571–2572. https://doi.org/10.1001/jama.2012.110700. PMID: 23160987.

Neria, Y., Solomon, Z., & Dekel, R. (1998). An eighteen-year follow up of Israeli prisoners of war and combat veterans. *The Journal of Nervous and Mental Disease, 186*, 174–182. PMID: 9521353.

Neria, Y., Solomon, Z., Ginzburg, K., Dekel, R., Enoch, D., & Ohry, A. (2000a). Posttraumatic residues of captivity: A follow-up of Israeli ex-prisoners of war. *Journal of Clinical Psychiatry, 61*, 39–46. PMID: 10695645.

Neria, Y., Solomon, Z., Ginzburg, K., & Dekel, R. (2000b). Sensation seeking, wartime performance, and long-term adjustment among Israeli war veterans. *Personality and Individual Differences, 29*, 921–932. https://doi.org/10.1016/S0191-8869(99)00243-3.

Neria, Y., Guttman-Steinmetz, S., Koenen, K., Levinovsky, L., Zakin, G., & Dekel, R. (2001). Do attachment and hardiness relate to each other and to mental health in real life stress? *Journal of Social and Personal Relationships, 18*, 844–858. https://doi.org/10.1177/0265407501186006.

Neria, Y., Bromet, E. J., Sievers, S., Lavelle, J., & Fochtmann, L. J. (2002). Trauma exposure and posttraumatic stress disorder in psychosis: Findings from a first-admission cohort. *Journal of Consulting and Clinical Psychology, 70*, 246–251. https://doi.org/10.1037/0022-006X.70.1.246. PMID: 11860051.

Neria, Y., Bromet, E. J., Carlson, G. A., & Naz, B. (2005). Assaultive trauma and illness course in psychotic bipolar disorder: Findings from the Suffolk county mental health project. *Acta Psychiatrica Scandinavica, 11*, 380–383. https://doi.org/10.1111/j.1600-0447.2005.00530.x. PMID: 15819732.

Neria, Y., Gross, R., Olfson, M., Gameroff, M., Wickramaratne, P., Das, A., Pilowsky, D., Feder, A., Blanco, C., Marshall, R. D., Lantigua, R., Shea, S., & Weissman, M. M. (2006). Posttraumatic stress disorder in primary care one year after the 9/11 attacks. *General Hospital Psychiatry, 28*, 213–222. https://doi.org/10.1016/j.genhosppsych.2006.02.002. PMID: 16675364.

Neria, Y., Olfson, M., Gameroff, M., Wickramaratne, P., Pilowsky, D., Verdeli, H., Gross, R., Manetti-Cusa, J., Marshall, R. D., Lantigua, R., Shea, S., & Weissman, M. M. (2008a). Trauma exposure and posttraumatic stress disorder among primary care patients with bipolar spectrum disorder. *Bipolar Disorders, 10*, 503–510. https://doi.org/10.1111/j.1399-5618.2008.00589.x. PMID: 18452446.

Neria, Y., Olfson, M., Gameroff, M., Gross, R., Pilowsky, D., Blanco, P. C., Manetti-Cusa Wickramaratne, J., Lantigua, R., Shea, S., & Weissman, M. M. (2008b). The mental health sequelae of loss: Findings from a

New York city primary care practice one year after the 9/11 attacks. *Psychiatry, 71*, 339–348. https://doi.org/10.1521/psyc.2008.71.4.339.

Neria, Y., Olfson, M., Gameroff, M. J., DiGrande, L., Wickramaratne, P., Gross, R., Pilowsky, D. J., Neugebauer, R., Manneti-Cusa, J., Lewis-Fernandez, R., Lantigua, R., Shea, S., & Weissman, M. (2010). Long term course of probable PTSD after the 9/11 attacks: A study in urban primary care. *Journal of Traumatic Stress, 23*, 474–482. https://doi.org/10.1002/jts.20544. PMID: 20690169.

Papini, S., Sullivan, G. M., Hien, D. A., Shvil, E., & Neria, Y. (2015). Toward a translational approach to targeting the endocannabinoid system in posttraumatic stress disorder: A critical review of preclinical research. *Biological Psychology, 104C*, 8–18. https://doi.org/10.1016/j.biopsycho.2014.10.010.

Shultz, J. M., Garfin, D. R., Espinel, Z., Araya, R., Oquendo, M. A., Wainberg, M. L., Chaskel, R., Gaviria, S. L., Ordóñez, A. E., Espinola, M., Wilson, F. E., García, N. M., Gómez Ceballos, Á. M., Garcia-Barcena, Y., Verdeli, H., & Neria, Y. (2014). Internally-displaced "victims of armed conflict" in Colombia: The trajectory and trauma signature of forced migration. *Current Psychiatry Reports, 16*(10), 475. https://doi.org/10.1007/s11920-014-0475-7.

Shultz, J. M., Walsh, L., & Neria, Y. (2015a). The 2010 deepwater horizon oil spill: The trauma signature of an ecological disaster. *Journal of Behavioral Health Services & Research, 42*(1), 58–76.

Shultz, J. M., Baingana, F., & Neria, Y. (2015b). The 2014 Ebola outbreak and mental health: Current status and recommended response. *JAMA, 313*(6), 567–568. https://doi.org/10.1001/jama.2014.17934.

Shvil, E., Rusch, H., Sullivan, G. M., & Neria, Y. (2013). Neural, behavioral, and psychophysiological markers of fear processing in PTSD: A review of the literature. *Current Psychiatry Reports, 15*, 358. https://doi.org/10.1007/s11920-013-0358-3. PMID: 23619614.

Shvil, E., Sullivan, G. M., Schafer, S. Markowitz, J. C., Campeas, M, Wager, T.D., Milad, M.R., & Neria, Y. (2014). Sex differences in extinction recall in posttraumatic stress disorder: An fMRI pilot study. *Neurobiology of Learning and Memory.* pii: S1074-7427(14)00029-X. https://doi.org/10.1007/978-3-319-28099-8.

Solomon, Z., Ginzburg, K., Mikulincer, M., Neria, Y., & Ohry, A. (1998). The role of attachment in coping with war captivity. *The European Journal of Personality., l2*, 271–285. https://doi.org/10.1002/(SICI)1099-0984(199807/08)12:4%3C271::AID-PER309%3E3.0.CO;2-U.

Zakin, G., Solomon, Z., & Neria, Y. (2003). Hardiness, attachment style, and long term distress among Israeli POWs and combat veterans. *Personality and Individual Differences, 34*, 819–829. https://doi.org/10.1016/S0191-8869(02)00073-9.

Nervousness

▶ Anxiousness
▶ Sensitivity
▶ State-Trait Anxiety Inventory

Netter, Petra

Petra Netter
Universität Giessen, Giessen, Germany

Petra S. Netter is a retired professor of psychology at the Department of Psychology of the Justus Liebig University of Giessen, Germany. She held the chair of *Personality and Individual Differences* from 1979 to 2002 and was an associate member of the Medical Faculty of the University of Giessen since 1981.

Early Biography and Educational Background

Petra Netter was born on April 1, 1937, in Hamburg and studied psychology and medicine at the universities of Hamburg and Innsbruck (Austria). She obtained her Diploma (MA exam) in Psychology in 1960 and her medical degree in 1966 in Hamburg.

She obtained her PhD in Psychology in Hamburg with a thesis on psychopharmacology of individual differences and her MD degree in 1970 by a thesis on psychological differences as related to bodily constitution. The Habilitation (license for academic teaching) followed after 2 years of medical internship in 1975 at the University Clinic of Mainz by an investigation on pregnancy and child development performed on a data set of an epidemiologic multicenter study at the Department of Medical Statistics in Mainz.

Professional Career

Petra Netter served as research assistant at the Department of Medical Statistics in Mainz from 1968 to 1975. She was appointed associate professor for Differential Psychology and Applied Clinical Physiology at the Department of Psychology, University of Düsseldorf, in 1975 and became section head of Medical Psychology at the Medical Faculty of the University of Mainz in 1977. From 1979 to 2002, she held a chair of Personality Psychology and Individual Differences at the University of Giessen, where she was lecturing on individual differences, biological psychology, and psychopharmacology and supervised psychology students for their BA, MA, and PhD degrees and medical students for obtaining their medical doctor's degree. Her publications, mainly concerned with the biological basis of individual differences and methods of research in epidemiology, appeared in psychological and medical journals and in textbooks on personality psychology, psychiatry, and statistical methodology. She served as associate editor of *Human Psychopharmacology*, *Pharmacopsychiatry*, *and Neuropsychobiolo*gy and as member of the editorial board on *Personality and Individual Differences and European Journal of Personality.*

Research Interests

Netter's early interests were in suggestibility and its relation to pain perception and placebo responses, but the major interest up to the present time focused on personality-related biological differences. These concerned blood-level responses of catecholamines and hormones to different stressors as related to hypertension, psychosomatic complaints, and personality traits as well as endocrine responses to neurotransmitter challenge tests elicited by neurotransmitter-specific drugs and their relationship to extraversion, anxiety, depression, impulsivity, and aggression, as well as to alcohol and nicotine intake and dependence. The emphasis in most studies was on elucidating biological mechanisms of psychological traits and behavior and identifying types and subtypes of traits or diseases by interactions between different measures and by patterns of biological responses. In some studies types and patterns could be identified by the statistical method of configural frequency analysis (CFA) developed by G.A. Lienert. By this procedure subtypes of aggression (neurotic and psychopathy-related aggression) or depression (social and physical anhedonia) or impulsivity (motor and attentional impulsivity) or addicted and nonaddicted smoking could be discriminated by different constellations of responses to serotonergic, noradrenergic, and dopaminergic drugs.

Selected Bibliography

Netter, P. (1989). Sensory suggestibility, its measurement, individual differences, and relation to placebo and drug effects. In V. A. Gheorghiu, P. Netter, H. J. Eysenck, & R. Rosenthal (Eds.), *Suggestibility: Theory and research* (pp. 123–133). Heidelberg: Springer.

Netter, P. (2004). Personality and hormones. In R. M. Stelmack (Ed.), *On the psychobiology of personality* (pp. 353–377). New York: Elsevier.

Netter, P. (2005). Endokrine Systeme und Persönlichkeit (endocrine systems and personality). In J. Hennig & P. Netter (Eds.), *Biopsychologische Grundlagen der Persönlichkeit, (Biopsychological basis of personality)* (pp. 291–396). München: Spektrum Akademischer Verlag/Elsevier.

Netter, P. (2006). Dopamine challenge tests as an indicator of psychological traits. *Human Psychopharmacology: Clinical and Experimental, 21*, 91–99.

Netter, P. (2015). Neuroendocrinology. In J. D. Wright (Ed.), *International encyclopedia of the social & behavioral sciences* (2nd ed., Vol. 16, pp. 648–655). Oxford: Elsevier.

Netter, P., & Hennig, J. (2016). Discriminating depression, physical and social anhedonia by neurotransmitter related challenge tests. *Psychology, 7*, 275–285. https://doi.org/10.4236/psych.2016.73030.

Netter, P., Vogel, W., & Rammsayer, T. (1994). Extraversion as a modifying factor in catecholamine and behavioral responses to ethanol. *Psychopharmacology, 115*, 206–212.

Netter, P., Toll, C., Lujic, C., Reuter, M., & Hennig, J. (2002). Addictive and non-addictive smoking as related to responsiveness of neurotransmitter systems. *Behavioral Pharmacology, 13*, 441–449.

Netter, P., Baars, M. Y., Harro, J., Reuter, M., Montag, C., Eensoo, D., Müller, M. J., & Gallhofer, B. (2015). MAO-B activity in platelets and the MAO-B gene polymorphism are differently related to personality traits in alcohol dependent patients. *International Neuropsychiatric Disease Journal, 4*(1), 14–28.

Nettle, Daniel

Daniel Nettle
Centre for Behaviour and Evolution and Institute of Neuroscience, Newcastle University, Newcastle, UK

Daniel Nettle is a British behavioral scientist. His broad research interests center around individual differences, mental health and disorders, effects of early-life events on adult outcomes, and social behavior. He works on both humans and birds. He uses a wide range of experimental, observational, and computational methods and has also written a number of books aimed at a general audience.

Education

Nettle was born in Twickenham, England, in October 1970. He completed an undergraduate degree in psychology and philosophy at the University of Oxford. His graduate work on the evolution of language and languages was completed in the Department of Anthropology, University College London, under the supervision of Robin Dunbar and Leslie Aiello. He took his PhD in 1996.

Professional Career

Nettle took up a lecturer position at Newcastle University in 2004, rising to full professor in 2011. At Newcastle he has served as director of the *Centre for Behaviour and Evolution*. He was president of the *European Human Behaviour and Evolution Association (EHBEA)* from 2013 to 2016.

Research Interests

Nettle is perhaps best known for his work on personality variation from an evolutionary perspective. Broadly, he argues that deviations from the average on any personality dimension tend to be associated with benefits to some fitness-relevant outcomes (e.g., social status) but costs to others (e.g., survival). Because the relative importance of these different outcomes in determining overall fitness varies between environments and across time, natural selection has not homed in on any optimal personality constellation. Instead, heritable variation persists: there is a broad range of observed variation in every personality trait that has been studied, and all except perhaps the very extremes of the distribution should be considered normal and non-pathological. He applied this logic to each of the dimensions of the five-factor model of personality (Nettle 2006, 2007), as well as to schizotypal traits, which he linked to creativity (Nettle 2001). Relatedly, he has written on how capacities such as anxiety and low mood, often conceptualized as purely dysfunctional within psychology, have an adaptive basis (Bateson et al. 2011; Nettle and Bateson 2012).

Nettle subsequently turned his attention to environmental influences on individual behavioral differences. This encompasses both developmental plasticity (the way events in early life might shape adult behavior) and the impact of immediate situation on behavior. Much of his work on developmental plasticity is carried out in European starlings. Birds have the advantage that early-life experience can be experimentally manipulated, whereas human studies of developmental plasticity always have to be correlational. In starlings, Nettle's group showed that even brief experience of difficulty obtaining food as a young bird affected adult food-related traits, making individuals prone to eat more and carry more fat (Andrews et al. 2015; Bloxham et al. 2014). He has also shown that childhood adversity is associated with a number of adult behavioral consequences in humans (Nettle et al. 2011; Paál et al. 2015). He has theorized about why these early-life effects might have evolved (Nettle and

Bateson 2015): broadly, he argues that early experience can play both an informational role (telling the organism what kind of world it lives in) and a constraining role (limiting the physical phenotypes it can construct, e.g., through energetic insufficiency). The adult has to adapt its behavior to both its environment and the physical phenotype it has, leading to associations between early-life conditions and adult behavior. The relative importance of informational and constraining effects of early experience differ from trait to trait.

In contrast to this work on the small effect of long-term exposures over the life course, he has also demonstrated large effects of very short-term exposure to particular situations on adult traits. As part of his ongoing program of work on the consequences of socioeconomic deprivation, he conducted an experiment in which volunteers were transported to either an affluent, orderly neighborhood or a deprived, disordered neighborhoods (Nettle et al. 2014). After just 45 min in their new environment, the volunteers in the deprived neighborhood rated themselves as more paranoid and less trusting than those in the affluent neighborhood. The differences between the two experimental groups of volunteers were very similar to the differences between the long-term residents of the two neighborhoods, suggesting that apparently trait-like differences between population groups might actually be consequences of ongoing situational exposures, in this case to cues of social disorder such as litter and broken windows.

Alongside his interests in individual differences, in collaboration with Melissa Bateson, Nettle has pursued a program of research on the "watching eyes" effect, the tendency of people to behave more prosocially when exposed to images of conspecific eyes. Their interest in this effect has been to explore its utility in field settings, particularly as a simple and cheap intervention to combat undesirable social outcomes such as littering and theft (Bateson et al. 2006, 2015; Nettle et al. 2012).

Personal Life

Nettle formerly worked as a professional actor and theatre director. He played a number of leading Shakespearean roles, including Shylock and Malvolio, on national tours, as well as Joseph K. in *Kafka's The Trial* in London. He sang a small part in the first fully staged UK production of Hans Krasa's opera *Brundibar.* Despite these attainments, his most lucrative acting project was a 10-s appearance in a dehumidifier commercial. Nettle is married to his collaborator Melissa Bateson, also of Newcastle University. He is a keen long-distance runner.

References

Andrews, C., Viviani, J., Egan, E., Bedford, T., Brilot, B., Nettle, D., & Bateson, M. (2015). Early-life adversity increases foraging and information gathering in European starlings, *Sturnus vulgaris*. *Animal Behaviour, 109*, 123–132.

Bateson, M., Brilot, B., & Nettle, D. (2011). Anxiety: An evolutionary approach. *Canadian Journal of Psychiatry. Revue Canadienne de Psychologie, 56*(12), 707–715.

Bateson, M., Nettle, D., & Roberts, G. (2006). Cues of being watched enhance cooperation in a real-world setting. *Biology Letters, 2*(3), 412–414. https://doi.org/10.1098/rsbl.2006.0509.

Bateson, M., Robinson, R., Abayomi-Cole, T., Greenlees, J., O'Connor, A., & Nettle, D. (2015). Watching eyes on potential litter can reduce littering: Evidence from two field experiments. *PeerJ, 3*, e1443. https://doi.org/10.7717/peerj.1443.

Bloxham, L., Bateson, M., Bedford, T., Brilot, B., & Nettle, D. (2014). The memory of hunger: Developmental plasticity of dietary selectivity in the European starling, *Sturnus vulgaris*. *Animal Behaviour, 91*, 33–40. https://doi.org/10.1016/j.anbehav.2014.02.025.

Nettle, D. (2001). *Strong imagination: Madness, creativity and human nature*. Oxford: Oxford University Press.

Nettle, D. (2006). The evolution of personality variation in humans and other animals. *American Psychologist, 61*(6), 622–631.

Nettle, D. (2007). *Personality: What makes you the way you are*. Oxford: Oxford University Press.

Nettle, D., & Bateson, M. (2012). The evolutionary origins of mood and its disorders. *Current Biology: CB, 22*(17), R712–R721. https://doi.org/10.1016/j.cub.2012.06.020.

Nettle, D., & Bateson, M. (2015). Adaptive developmental plasticity: What is it, how can we recognize it and when can it evolve ? *Proceedings of the Royal Society B-Biological Sciences, 282*, 20151005.

Nettle, D., Coall, D. A., & Dickins, T. E. (2011). Early-life conditions and age at first pregnancy in British women. *Proceedings of the Royal Society B-Biological Sciences, 278*(1712), 1721–1727. https://doi.org/10.1098/rspb. 2010.1726.

Nettle, D., Nott, K., & Bateson, M. (2012). "Cycle thieves, we are watching you": Impact of a simple signage intervention against bicycle theft. *PloS One, 7*(12), e51738. https://doi.org/10.1371/journal.pone.0051738.

Nettle, D., Pepper, G. V., Jobling, R., & Schroeder, K. B. (2014). Being there: A brief visit to a neighbourhood induces the social attitudes of that neighbourhood. *PeerJ, 2*, e236. https://doi.org/10.7717/peerj.236.

Paál, T., Carpenter, T., & Nettle, D. (2015). Childhood socioeconomic deprivation, but not current mood, is associated with behavioural disinhibition in adults. *PeerJ, 3*, e964. https://doi.org/10.7717/peerj.964.

Network Analysis

Giulio Costantini and Marco Perugini
University of Milano-Bicocca, Milan, Italy

Synonyms

Attitudes as networks; Graph theory in psychology; Personality networks; Psychological networks; Psychopathology networks

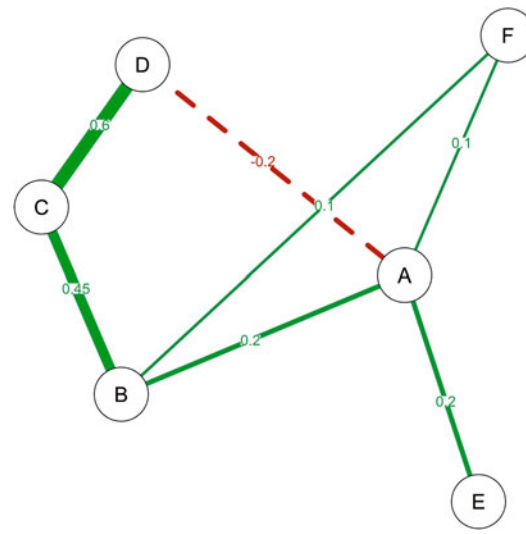
Definition

A network is an abstract model, in its simplest form including only a set of nodes, that represent the elements of a phenomenon (e.g., individuals, websites, genes), and a set of edges that connect pairs of nodes. Edges can represent any kind of relationship among nodes (e.g., social connections, web links, co-expression of genes). Therefore, a phenomenon can be analyzed as a network if it can be broken down to a set of elements and as a set of pairwise interactions among them. *Network analysis* refers to a wide array of techniques for analyzing networks. These techniques can answer questions regarding the global structure of a network (e.g., is the network a *small-world?*) and the importance of specific nodes and edges (e.g., which is the most *central* node?). In psychology, networks have been used recently to model psychological phenomena that had been traditionally modeled almost exclusively as latent variables, including psychopathology, attitudes, and personality psychology.

Introduction

Figure 1 represents a simple example of a network with six nodes and seven edges. Nodes can represent several kinds of entities: Whereas in social networks nodes typically represent individuals, in psychology nodes represent variables that are relevant for a certain phenomenon. For instance, in psychopathology nodes represent psychological problems, such as *sleep problems* and *suicidal ideation* (Borsboom and Cramer 2013); in attitude research, nodes represent different kinds of evaluative reactions (Dalege et al. 2015); and in personality psychology nodes represent thoughts, feelings, behaviors, and motivations, that characterize certain personality aspects (Costantini and Perugini 2016; Cramer et al. 2012).

Edges represent pairwise relationships among variables. There are several kinds of networks according to the type of relationships that their edges encode. In the simplest case, an edge between two nodes can be either absent or present, indicating only the presence or the absence of a relationship. These networks are said to be *unweighted*. Conversely, *weighted networks*



Network Analysis, Fig. 1 *Simple example of a network with six nodes and seven edges.* Full (*green*) lines represent positive edges and dashed (*red*) lines represent negative edges. Edge weights are indicated by numeric values on the edges and by edge thickness. The plot was obtained using the R package *qgraph* (Epskamp et al. 2012)

include weights that give information about the intensity of the relationships. In Fig. 1, edge weights indicate that the strongest relationship is the one between nodes *C* and *D*. Weights are very important in psychology. For instance, in a network representing the attitudes towards presidential candidates, judging a candidate as *intelligent* was connected both to judging him *knowledgeable* and *moral*; however, the connection between *intelligent* and *knowledgeable* was much stronger than the connection between *intelligent* and *moral* (Dalege et al. 2015, Fig. 2). This piece of information would be lost if weights were disregarded. If edge weights can have both positive and negative signs, the network is said to be also *signed*. The network in Fig. 1 is signed, because it includes a negative connection between nodes *A* and *D*. Taking signs into account is also very important. For instance, in a network representing conscientiousness facets and related constructs, the node *need for closure* was positively connected with *orderliness* and negatively with *industriousness* (Costantini and Perugini 2016). Considering edge signs is the only way to understand these kinds of differential relationships. *Directed networks* additionally encode information about the direction of relationships, whereas undirected networks (such that in Fig. 1) do not encode this kind of information. In psychology, edge directions are typically used for representing processes that take place over time (Borsboom and Cramer 2013).

Psychological networks can be computed in several ways. Since nodes represent variables, a simple way to estimate their interaction is to use the Pearson's correlation coefficient. An edge is drawn between two variables if they correlate, the weight and sign of the edge corresponding to the correlation coefficient (Cramer et al. 2012). However, to avoid spurious relationships (i.e., those due to the confounding effect of other variables in the network), partial correlations are often preferred. In this case, an edge is drawn between two nodes if they correlate after controlling for all other variables in the network. The absence of an edge in a partial correlation network is particularly informative because it indicates that two nodes are conditionally independent given the others. Regularized estimates of partial correlations can be obtained with methods such as the *adaptive lasso* or the *graphical lasso*. These methods result in sparse networks (with relatively few edges), prevent overfitting, and provide a parsimonious model of the data (Costantini et al. 2015; Epskamp et al. 2012). Time series data can be used for computing directed networks, which encode also the temporal dependencies among nodes (Borsboom and Cramer 2013).

Networks Analysis in Psychology

Once a network is computed, network analysis provides a wide array of techniques and allows extracting relevant information from the network (for a practical introduction of network analysis in personality psychology, see Costantini et al. 2015; for a general introduction of networks across disciplines, see Newman 2010). A first class of techniques investigates *topology*, the large-scale organization of a network. For instance, networks with a small-world topology are characterized by a clustered structure (nodes tend to coalesce into distinguishable subgroups) with bridges that connect the clusters. The small-world topology plays a crucial role in psychopathology, in which it has been advocated as an explanation of comorbidity (Borsboom and Cramer 2013).

Network analysis provides also a wide array of *centrality* metrics, which quantify the relative importance of specific nodes. Each index reflects a different way in which a node can be important. First, a node can be central simply because it has many *neighbors*, nodes that are directly connected to it (*degree centrality*). In weighted networks, this property can be generalized to take into account edge weights (*strength centrality*). In Fig. 1, node A is the most degree-central and node *C* is the most strength-central: Even if node *A* has four neighbors and node *C* has only two, the sum of the absolute weights connecting *C* with its neighbors is larger than for A. Degree and strength indicate how much a node can influence other nodes directly, without intermediaries. However, indirect connections can play a role too: In network analysis, there are algorithms that allow

identifying efficiently the shortest paths connecting any two nodes (Newman 2010). *Closeness centrality* is a measure of how much a node is connected to all other nodes by short paths. In Fig. 1, node *B* is the most closeness central, because all other nodes can be reached relatively quickly from its position. Yet another way in which a node can be central is because that node is particularly important for the other nodes to interact with each other. A node that often lies on the shortest paths connecting other nodes is said to be *betweenness-central*. In Fig. 1, node *A* is the most betweenness-central, since it provides the only connections between node *E* and all other nodes. The *clustering coefficient* is the tendency of a node's neighbors to be connected to each other. The more the neighbors of a node are also connected, the less that node is fundamental for its neighbors to reach each other. In Fig. 1, node *F* has the highest clustering coefficient, since its only two neighbors (*A* and *B*) are also connected to each other. Therefore, *F* does not appear to play a crucial role in the network.

Network analysis allows investigating mechanisms that could be easily missed if one simply assumed, by default, that psychological phenomena are manifestations of unobservable latent variables. For instance, in the case of personality, it has been typically assumed that the pattern of covariation among specific behaviors (e.g., doing homework), emotions (e.g., experiencing pride), cognitions (e.g., focusing on future), and motivations (e.g., being sensitive to positive outcomes) indicates the presence of a latent variable (e.g., conscientiousness). Whereas latent variables constitute useful and succinct summaries of individual differences, they do not have, by themselves, explanatory power (Mõttus 2016). From the network perspective, the coalescence of individual differences into broad personality traits is not an explanation but a phenomenon to explain. In this view, personality dimensions are considered emergent phenomena that arise from a network of more basic individual differences. For instance, a student that focuses on the future and is motivated by positive results is likely to spend more effort in school activities, such as doing homework, and will eventually obtain better grades, of which she would be proud (Costantini and Perugini 2016; Cramer et al. 2012). Not only networks provide an explanation of why broad personality factors emerge but also of why more specific clusters, such as personality facets, emerge as well. In the case of conscientiousness, all facets have been shown to share common features (i.e., common neighbors in the network), which make them clump together into a single dimension, and unique features, that make them different from each other (Costantini and Perugini 2016). Similar arguments can be made also for attitude research, in which the coalescence of evaluative reactions into an overall attitude is explained in terms of network processes (Dalege et al. 2015), and in psychopathology, in which the emergence of a disorder as a unique entity and the onset and the termination of a psychopathology are explained in terms of interactions among problems within a network (Borsboom and Cramer 2013; van de Leemput et al. 2014).

Conclusion

Network analysis includes a vast array of models and methods that are established in several scientific fields (e.g., physics, biology, computer science, sociology) and have recently found many applications in several branches of psychology. These techniques are implemented in software packages that make them relatively easy to apply (e.g., Costantini et al. 2015; Epskamp et al. 2012). Network analysis offers a new perspective to phenomena such as personality, attitudes, and psychopathology. However, it should not be considered in contrast to latent variable modeling: Some of the most interesting developments are likely to come from the combination of these traditions into more general models (Epskamp et al. in press).

References

Borsboom, D., & Cramer, A. O. J. (2013). Network analysis: An integrative approach to the structure of psychopathology. *Annual Review of Clinical Psychology, 9*(1), 91–121. https://doi.org/10.1146/annurev-clinpsy-050212-185608.

Costantini, G., & Perugini, M. (2016). The network of conscientiousness. *Journal of Research in Personality, 65*(1), 68–88. https://doi.org/10.1016/j.jrp.2016.10.003.

Costantini, G., Epskamp, S., Borsboom, D., Perugini, M., Mõttus, R., Waldorp, L. J., & Cramer, A. O. J. (2015). State of the aRt personality research: A tutorial on network analysis of personality data in R. *Journal of Research in Personality, 54*, 13–29. https://doi.org/10.1016/j.jrp.2014.07.003.

Cramer, A. O. J., van der Sluis, S., Noordhof, A., Wichers, M., Geschwind, N., Aggen, S. H., …, & Borsboom, D. (2012). Dimensions of normal personality as networks in search of equilibrium: You can't like parties if you don't like people. *European Journal of Personality, 26*(4), 414–431. https://doi.org/10.1002/per.1866.

Dalege, J., Borsboom, D., van Harreveld, F., van den Berg, H., Conner, M., & van der Maas, H. L. J. (2015). Toward a formalized account of attitudes: The Causal Attitude Network (CAN) model. *Psychological Review, 123*(1), 2–22. https://doi.org/10.1037/a0039802.

Epskamp, S., Cramer, A. O. J., Waldorp, L. J., Schmittmann, V. D., & Borsboom, D. (2012). qgraph: Network visualizations of relationships in psychometric data. *Journal of Statistical Software, 48*(4), 1–18.

Epskamp, S., Rhemtulla, M., & Borsboom, D. (in press). Generalized network psychometrics: Combining network and latent variable models. *Psychometrika*.

van de Leemput, I. A., Wichers, M., Cramer, A. O. J., Borsboom, D., Tuerlinckx, F., Kuppens, P., …, & Scheffer, M. (2014). Critical slowing down as early warning for the onset and termination of depression. *PNAS, 111*(1), 87–92. https://doi.org/10.1073/pnas.1312114110.

Mõttus, R. (2016). Towards more rigorous personality trait-outcome research. *European Journal of Personality, 30*(4), 292–303. https://doi.org/10.1002/per.2041.

Newman, M. E. J. (2010). *Networks: An introduction*. New York: Oxford University Press.

Neural Net

► Neural Networks

Neural Networks

Steven L. Prime
Department of Psychology, University of Saskatchewan, Saskatoon, SK, Canada

Synonyms

Neural net; Semantic network

Definition

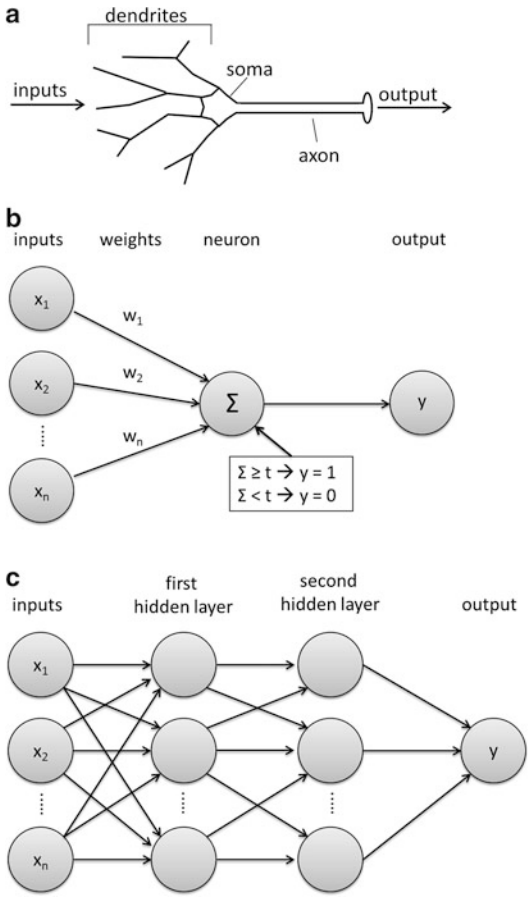
(1) An interconnected system of neurons that receives and processes information to perform some function in the central nervous system. (2) A computational model, usually performed on a computer, of information processing units designed to emulate brain function and learning.

Introduction

The term "neural network" can refer to either biological neural networks or artificial neural networks, though it is usually used to refer to the latter. A biological neural network is a system of interconnected brain cells, called "neurons," which make up the central nervous system. In cognitive science and neuroscience, biological neural networks are seen as information processing systems. Cognitive processes are a result of the interaction of highly interconnected neurons, sometimes spanning across multiple cortical regions. An artificial neural network (ANN) is a computational model that seeks to emulate a biological neural network to better understand specific computing processes in the brain. Since ANNs are inspired by the structure and function of the brain, they consist of interconnected processing units based on neurons.

Biological Neural Networks

The human brain consists of billions of highly interconnected neurons. Neurons are the basic information-computing units of the central nervous system. Most neurons have three basic parts (Fig. 1a): branch-like structures called dendrites that receive inputs from other neurons; a soma (cell body) that processes the inputs; and, a cable-like structure called an axon that sends output signals to other neurons. Neurons are connected to each other by synapses, small gaps between one neuron's axon and another neuron's dendrites. When a neuron is activated (or "fires") it sends out an electrical impulse along its axon (called a neural impulse or spike) and transmits signals to another neuron across the synapse.



Neural Networks, Fig. 1 Simple illustration of a neuron (**a**) and artificial neural networks of only one processing unit representing an "artificial" neuron (**b**) and more complex models with multiple processing units (**c**) in a multilayered network

Signals could either increase (excite) or decrease (inhibit) the activity of the recipient neuron. Whether or not the neuron receiving these inputs will become activated depends on the relative summation of all the excitatory and inhibitory signals from potentially thousands of other neurons reaching a certain threshold (which varies between neurons), a process called neural summation. The degree to which a neuron is excited (more activated) or inhibited (less activated) in turn modulates through its frequency of output signals the activity of other neurons further along the processing chain. Thus, a neuron "computes" by integrating input signals and transforming them into output signals.

Artificial Neural Networks

Artificial neural networks (ANN) attempt to understand the neural computations that take place in biological neural networks based on how neurons might work. An ANN is composed of interconnected processing units that represent neurons, the so-called "artificial neurons." Warren McCulloch and Walter Pitts (1943) were the first to develop a mathematical ANN model. They modeled a simple neural network that described neurons as binary switches. Emulating real neurons, the McCulloch-Pitts' "neuron" has a state that is either active (on) or inactive (off), which is determined by the weighted sum of the states of the inputs from other "neurons." Just like real neurons, an artificial neuron in an ANN also receives inputs from one or more neurons and sums them together (Fig. 1b). If the weighted sum of the inputs exceeds some fixed threshold, the neuron is set to active and it produces an output. Otherwise, it remains inactive. Using this simple network model, McCulloch and Pitts sought to better understand how the brain could perform highly complex information processing.

McCulloch and Pitts' simple network has been shown to be remarkably versatile in implementing formal logic functions involving "a and b," "a or b," and "not a." Let's consider an example. For simplicity sake, in this example there are only two inputs (x_1 and x_2), each with a weight that is set at 1, and our neuron's threshold (t) is set at a value of 2. Each input that is present is given a value of 1, otherwise it is 0. Imagine we design a model so that our neuron produces a signal only when x_1 and x_2 inputs are present (the logic AND function). If our neuron receives only one input from x_1 but not from x_2, then x_1 is present (its value is 1) and x_2 is not (its value is 0). All we need to do is to calculate the weighted sum of all the inputs by multiplying each input's value (1 or 0) with its respective weight and adding them all up. So in the case where the input x_1 is active, but not x_2, the weighted sum of these inputs is $1, (1 \times 1) + (0 \times 1) = 1$, which is below the neuron's threshold ($1 < t$). The neuron will not be activated and its output (y) is 0. If the neuron receives both inputs (x_1 and x_2 are present, and

then, both have value of 1), then the weighted sum will be 2, $(1 \times 1) + (1 \times 1) = 2$, which reaches threshold and $(2 = t)$ and the neuron will be activated and its output (y) is 1. Different logical functions can be performed by a different set of weights. For instance, we can change our model in our example to a logic AND NOT function where the neuron is activated when input x_1 is present and not input x_2 (or, x_1 is true and x_2 is false) by simply changing their respective weights so that x_1 input has a weight of 2 and x_2 has a weight of -1 (an inhibitory signal). In this case, if the input x_1 is present (or we can also say "true"), but not x_2, the neuron would be activated: $(1 \times 2) + (0 \times -1) = 2$ and $2 = t$. If both inputs are present the neuron would not be activated: $(1 \times 2) + (1 \times -1) = 1$ and $1 < t$.

Learning in ANN

McCulloch and Pitts' original model has some limitations. For instance, the values of the weights and thresholds are set beforehand when designing the model. This means that the model does not have the capacity to "learn" and acquire or adapt to new information. Learning in neural networks involves changes in the number or strength of excitatory and inhibitory connections (i.e., inputs) so that the influence neurons have on each other changes. In neuropsychology, this is called Hebbian learning after Donald Hebb, who is credited with being the first to put forth a theory of learning based on neural adaptations (Hebb 1949). Hebb proposed that neural pathways are strengthened each time they are used in response to learning. The phrase "cells that fire together, wire together" is often used to summarize this theory. Hebb's theory of learning in biological systems inspired researchers to apply Hebbian learning rules to ANNs.

One of the first computer simulated ANNs that demonstrated Hebbian learning was the "perceptron" learning algorithm developed by Frank Rosenblatt (Rosenblatt 1957). In perceptron learning, the weights are initialized with a set of random numbers, then a set of inputs is delivered to the neuron and an output is computed. Learning occurs by an algorithm that adjusts the weights by taking into account the difference between the computed output and the desired output (i.e., taking into account the error) over many reiterations. This means that learning only occurs if an error has been made, otherwise the weights remain unchanged. Thus, the perceptron learning algorithm is an adaptive model that self-organizes to produce the desired behavior. In essence, the ANN can be "trained" in an automated fashion to process data until it outputs the results the human operator is searching for.

Multilayer Networks

The most common ANNs consist of multiple layers of processing units (i.e., neurons) between input and output, called "hidden layers" (Fig. 1c). The hidden units in one layer compute some combination of values it receives from the previous layer. The simplest multilayer network is a feedforward network where signals are fed in only direction from input to output. Recurrent multilayer networks are more complex configurations where signals can be sent in both directions as well as across neurons within a layer. The key advantage of recurrent multilayer networks is their capability of performing more complex computations than simple feedforward networks.

Multilayer networks can learn from a variety of methods compared to single-layer networks consisting of simple input to output connections. Broadly, there are three main ways multilayer networks can be trained: supervised learning, unsupervised learning, and reinforcement learning. In supervised learning, the network is trained by providing it with a set of inputs and the correct output, and then it has to figure out how to computationally process the inputs to produce that output. In unsupervised learning, the network is only given a set of inputs and it has to figure out patterns among the inputs. Last, in reinforcement training, the network is not given the correct answer to a problem, but is only provided with information about whether its output is right or wrong, which the network uses to improve its

performance. As research in neural networks and machine learning advances, ANNs have been used in a broad range of neuroscience research, such as investigations into the mechanisms of pattern recognition and spatial cognition, and computer learning applications, such as voice recognition and market investment analysis.

Cross-References

- ▶ Connectionist Networks
- ▶ Modeling

References

Hebb, D. (1949). *The organization of behavior*. New York: Wiley.

McCulloch, W. S., & Pitts, W. H. (1943). A logical calculus of the ideas immanent in nervous activity. *Bulletin of Mathematical Biophysics, 5*, 115–133.

Rosenblatt, F. (1957). The perceptron – a perceiving and recognizing automaton. Report 85-460-1, Cornell Aeronautical Laboratory.

Neurofeedback

▶ Biofeedback

Neuroimaging

André Knops
Department of Psychology, Humboldt-Universität zu Berlin, Berlin, Germany

Definition

Neuroimaging is an umbrella term that refers to various methods of measuring and imaging the function or structure of the nervous system, in particular the brain.

Introduction

This chapter focuses on the principles and analysis of magnetic resonance imaging (MRI) in humans. This includes different technical approaches (e.g., structural MRI; functional MRI) as well as different statistical approaches (e.g., GLM; MVPA). Where possible, exemplar studies that make use of particular approaches or techniques are presented. Major advantages and disadvantages will be identified for each approach, and major conceptual issues concerning the association between brain anatomy or function and individual differences will be provided. A radically synthesized description of the physics underlying magnetic resonance imaging is given. The functional principles of other techniques such as computerized axial tomography (CT or CAT), positron emission tomography (PET), and single-positron emission computed tomography (SPECT), near infrared spectroscopy (NIRS) will only briefly be sketched.

Computerized Axial Tomography (CT or CAT)

Computerized axial tomography (CT) uses a series of two-dimensional X-rays of the head from different angles to reconstruct a three-dimensional image of the structure. It is commonly used to quickly diagnose bone trauma, hemorrhage, or tumors. The main advantage is the elimination of superimposed structures outside of the region of interest (ROI), as common in traditional 2D X-rays. Main disadvantage is the exposure to radiation which can potentially damage cells and DNA.

Positron Emission Tomography (PET)

Positron emission tomography (PET) measures the gamma rays emitted by positron-emitting radionuclides (tracer) that are introduced into the body shortly before the scanning session. Using glucose-analogues such as fludeoxyglucose, PET can be used to image metabolic activity via

glucose use. The idea is that highly active brain regions use more glucose than inactive (or less active) regions, which in turn leads to a difference in concentration of the positron-emitting tracer. Seizures will appear as hypometabolic during scanning, allowing the exact determination of a given seizures' center and extent. PET provides useful functional images but structural resolution is low.

Main disadvantages of PET are the exposure to ionizing radiation and the relatively costly procedure to produce the tracers.

Near Infrared Spectroscopy (NIRS)

Near infrared spectroscopy (NIRS) is a variant of spectroscopy and is based on the excitation of molecules by electromagnetic waves in the near infrared spectrum (760–2500 nm). Changes of hemoglobin can be detected through the skull up to a depth of about 1 cm beneath the inner surface of the skull and serve as a proxy for the level of activity of the underlying brain region. The main advantages of NIRS are its portability and easy and painless application that allows the measurement of more vulnerable samples such as patients or infants and children. It is less cost-intensive compared to PET or MRI and does not (in contrast to PET and MRI) require the participant to remain immobile during measurement.

The main disadvantage is the low spatial resolution.

Magnetic Resonance Imaging (MRI)

The Physics

In contrast to other imaging techniques that allow investigating the internal structure and function of the human brain such as CT or PET, MRI does not expose the subject to any potentially harmful X-rays or radiation. MRI uses the physical phenomenon that certain atomic nuclei such as water, which is abundant in the human body, can absorb and emit radio frequency energy. To do so, the head is positioned in the center of an extremely strong magnetic field, usually 3 Tesla (3 T). The magnetic field forces all protons to line up with the magnetic field, rather than remaining in their usual random orientation. Next, a short radio frequency impulse (more precisely: oscillating magnetic field in the radio frequency range) is administered which flips the alignment of the protons by a given angular amount (maximally 90°). After this impulse is turned off, the protons fall back to their initial orientation (i.e., they relaxate) and emit a small amount of radio wave energy which can be measured by detectors placed over the subjects' head. To determine the origin of the emitted signal, field gradients of varying strength along the three dimensions are added to the static magnetic field. Since the precession frequency (the frequency at which particles spin around an external magnetic field) is proportional to the strength of the magnetic field, applying the gradients causes spins at different spatial locations to precess at different rates. This allows measuring their individual contributions to the signal. By using different sequence parameters, different types of tissues can be visualized. For example, certain sequences predominantly visualize fat (e.g., gray and white matter), while others focus on water (e.g., in blood and cerebrospinal fluid).

Main disadvantage is the exposure to high magnetic field strength which bears the risk of inducing displacement in ferromagnetic implants (e.g., cochlear implant, pace maker) or other ferromagnetic materials that remain inside the body after surgery (e.g., nails after bone fractions). MRI requires the participants to remain immobile during measurement. This poses problems to certain psychiatric samples or children, for example. The confined environment within the MRI scanner may be problematic for persons suffering from claustrophobia.

Structural MRI

Structural MRI refers to the analysis of structural aspects of the brain as measured with MRI. Structural MRI provides images of the brain with a very high spatial resolution (usually about $1 \times 1 \times 1$ mm^3) and very low temporal resolution (~ 5 min for the whole brain). The high spatial resolution allows the investigation of macrostructural anatomical properties of the brain such as the form

of certain gyri and sulci or the volume within circumscribed brain areas, both in cross-sectional and in a longitudinal designs. Brain morphology differs between individuals. When comparing across different individuals, the problem of inter-interindividual variability concerning form, position, and size arises. A number of normalization procedures have been developed that allow registering the recorded brain images to a template that represents the "mean brain image" of, for example, 152 (MNI152 template) or 452 healthy participants (ICBM452 template).

Cortical Thickness

One commonly used analysis approach is to measure the cortical thickness. This requires to additionally determine the border between gray and white matter. Since the cortical thickness varies across different brain areas between 2 and 4 mm, the scanning resolution of 1 mm requires statistical and model-guided procedures to increase subvoxel precision. After the resulting meshes of different subjects have been registered to a common reference, a point-by-point comparison of cortical thickness can be computed and correlated with other variables, such as the Big Five personality traits.

Using this approach, some authors argue for a biological basis of the Big Five (DeYoung et al. 2010). For example, areas that are involved in reward processing correlate with extraversion. Neuroticism, on the other hand, was associated with cortical thickness in areas that are commonly associated with threat and punishment. Others did not observe any correlation between personality measure neuroticism and cortical thickness (Hu et al. 2011), or opposite correlations for male and female participants (Blankstein et al. 2009). Bjornebekk et al. (2013) found thinner cortex in inferior frontal gyrus (IFG) to be associated with higher extraversion and speculate "that a thinner IFG reflects a structural correlate of this tendency for extroverts to be less inhibited in speech and more daring than their introvert opposites" (p. 205).

Voxel-Based Morphometry

Voxel-based morphometry (VBM) uses a slightly different approach where the distribution of gray and white matter in different compartments is statistically compared across subjects. That is, for each voxel a binary or probabilistic value is determined that indicates the prevalence of cerebrospinal fluid, white matter, and gray matter, respectively. These maps are entered into a spatial smoothing procedure during which a Gaussian filter is applied to each of the three tissue maps. Smoothing reduces high-frequency noise and thereby increases signal to noise ratio. The resulting values are interpreted as "concentration" and index the local volume ratio of the different tissue classes (Ashburner and Friston 2000; Good et al. 2001). Finally, the concentration maps are entered to a second-level statistical procedure where local differences in the distribution of the three tissue classes can be compared, for example, between groups of subjects.

Liu and colleagues (2013) assessed the correlations of VMB-based distribution of gray and white matter with personality traits as measured by the complete version NEO Five Factor Inventory (McCrae and Costa 1987) in a sample of 227 participants. No associations were observed for gray matter concentration. In contrast, for white matter a negative correlation was observed between Conscientiousness and (a) right insula/rolandic operculum, and (b) left fusiform gyrus/parahippocampus. Authors interpret these correlations in terms of compensatory behavior. Since the described areas play an important role in "different complex sensory functions," participants may "compensate for impaired information processing [. . .] with higher conscientiousness" (p. 380). Coutinho et al. (2013) found extraversion to be negatively correlated with grey matter density in the middle frontal and orbitofrontal gyri while agreeableness was negatively correlated with grey matter density in the inferior parietal, middle occipital, and posterior cingulate gyri. Hu and colleagues (Hu et al. 2011) applied structural equational modeling to VBM measures to demonstrate the impact of various nuisance covariates

such as age and gender on the subtle neuroanatomical correlations with personality traits.

Issues when Correlating Structural Information with Personality Measures

A number of criticisms can be raised when structural characteristics of the brain are correlated with personality measures. First, there is an inherent bigger-is-better or bigger-is-more assumption. Yet, whether or not larger brain areas signify that more cognitive resources are devoted to a given function is questionable. It is conceivable that functional refining is realized via adding and pruning connections between neurons rather than by merely adding more neurons. Moreover, the impact a given region may exert on a cognitive function also depends on other nonstructural parameters of brain activity such as synchronicity. Hence, the association between function and structure may be more subtle than equating bigger areas with more computational power for a certain function.

While the particular association between structural and functional brain characteristics and circumscribed personality traits remain elusive, personality changes following brain damage in patient groups (e.g., frontotemporal lobe degeneration) generally support the overall idea (Mahoney et al. 2011).

Diffusion Tensor Imaging

Diffusion Tensor Imaging (DTI) can be used to visualize the structure of white matter fibers in the brain. DTI measures the displacement of molecules per unit time. By exploiting the phenomenon that in the brain free displacement of water molecules is restricted by bounding fibers (i.e., it is anisotropic), DTI provides a measure of directional diffusion. DTI uses a pulsed sequence, where two magnetic field gradients are applied with brief temporal distance to each other. The spin magnetization at each position is specifically labeled by these pulses. A displacement of the molecules in the delay between two pulses causes a signal loss that is proportional to the amount of displacement. Especially in white matter, the orientation of the gradients influences contrast and signal decay. Signal loss is maximal in directions perpendicular to the fiber orientation. In combination with a multitude of gradients in different directions (e.g., 64 directions), a reconstruction of white matter architecture is achieved with DTI. That is, for each voxel a three-dimensional ellipsoid is computed that determines the principle direction of diffusion (parallel to the largest axis of the ellipsoid). From the ellipsoid, different DTI indices can be computed such as fractional anisotropy (FA), which is the normalized variance of the ellipsoid's three eigenvalues. Combinations of eigenvalues can be used to demonstrate white matter pathology such as myelination (radial diffusivity) or axonal degeneration (axial diffusivity) (Alexander et al. 2007). This is helpful in detecting atypical white matter development or degenerative diseases (e.g., multiple sclerosis). To visualize white matter structure, left-to-right oriented fibers are coded in red, fibers in anterior-posterior direction coded in green, and fibers in inferior to superior direction in blue. Visualization of white matter tracts plays an important role in neurosurgical preoperative planning.

Main advantage of DTI is the painless and radiation-free possibility to measure and analyze structure of white matter in vivo. Main disadvantages concern some inherent methodological problems and the relatively long acquisition times (usually around 5–10 min) during which participants should remain stable. The algorithms underlying DTI are problematic for voxels containing different tissue types (e.g., at the boundary between CFS and white matter) and have difficulties determining DTI indices for voxels containing intersections between two nerve fibers.

Functional MRI (fMRI)

General Idea

Functional MRI (fMRI) seeks to establish a relation between a given region's change of neural

activity and an experimentally induced change of stimulus and/or mental state. The idea is to examine the neurofunctional consequences of a given change in experimental condition in order to understand how a given ROI contributes to a cognitive mechanism at hand. For example, in a box-car design, participants change every 30 seconds between (1) repeatedly subtracting 7 from a starting number (e.g., 93 ➔86 ➔79 ➔72 ➔. . .) and (2) sentence reading ("The old man is reading a book."). Comparing the activity between calculation and reading reveals areas that are more involved in mental arithmetic than during sentence reading, such as bilateral areas along the intraparietal sulcus and dorsolateral prefrontal cortex. Since two conditions are subtracted from each other, this is referred to as subtraction logic (Donders 1969; Posner et al. 1988). More recent designs do not require the block-wise presentation of stimuli but operate on an event-related schedule with fast and intermixed presentation of different conditions in an experimental design. It has been proven advantageous to include more than two expressions of the independent variable in a so-called parametric approach. For example, rather than dividing numerical distance between numbers in a numerical magnitude comparison task into categories small (<5) and large (>5), the numerical distance may serve as a parametric regressor in a given experiment.

Functional Principle and Preprocessing

Functional MRI uses the phenomenon that the brain uses glucose which is supplied via the blood. The regional cerebral blood flow (rCBF) flexibly adapts to the amount of energy needed in a given area of the brain. More active areas require more glucose and hence increased rCBF is observed. Glucose consumption burns oxygen. As a consequence, the ratio of deoxygenated to oxygenated hemoglobin changes locally in response to cortical activity, with oxygenated blood supply usually overshooting the actual demand. Since deoxygenated hemoglobin (paramagnetic) has different magnetic properties compared to oxygenated hemoglobin (diamagnetic), the compensatory change of their ratio in response to cortical activity causes an improved MR signal. The blood-oxygen-level dependent (BOLD) contrast hence provides an indirect measure of cortical activity at a local scale. The BOLD signal changes at a relatively slow temporal scale, usually reaching a maximum after 4–6 s after stimulation. The peak latency depends on the brain area under investigation.

During fMRI scanning, a number of 2D brain slices (e.g., 30 slices) are repeatedly acquired, often covering the entire brain. The acquisition of each entire volume usually takes between 1.5 and 3 s. Each slice comprises a matrix of subunits, known as voxels. Compared to structural MRI, fMRI has a lower spatial resolution with voxel dimensions around 2–4 mm per side (e.g., $2 \times 2 \times 2\ mm^3$). Since each slice of a given volume is acquired at a different point in time, the temporal differences in acquisition require a correction, known as slice-time correction. A second major problem in fMRI are artifacts due to head motion. Each voxel is associated with a certain position in real space (i.e., the participant's head inside the scanner) and numerically reflects the magnetic properties at that position. If, for example, two neighboring voxels cover white and gray matter, respectively, the numerical values differ by a large margin (e.g., 120 and 55). A change in nervous activity predominantly affects gray matter voxels. Consequently, in the next recorded volume, the corresponding values may change to 120 and 58, for example. If, however, the participant moves in-between the acquisition of two volumes, the voxel previously covering gray matter may now cover white matter. If undetected, we would erroneously conclude that activity has changed from initial 55 to 120 – a huge change in activity. During motion correction, the time-series of brain volumes are aligned via rigid body transformations along six dimensions (three spatial axes plus three rotations). After motion correction, non-linear transformations are applied to coregister the individual brain scans with a given template (using information from the anatomical MRI). Finally, high-frequency noise is reduced via spatial smoothing.

Statistical Analysis

Mass Univariate Statistics

During the mass univariate analysis approach, a general linear model (GLM) is applied to each voxel. The model parameters contain the experimental conditions as predictors (e.g., calculation & reading) and the head motion parameters as covariates (nuisance parameters). This model is convolved with the typical hemodynamic response function to predict the expected time-course for each voxel. As a result of model estimation, each of the regressors in the model (calculation, reading, head motion) is associated with a given parameter estimate (ß). The parameter estimates for each voxel is tested for significance (e.g., larger than zero; calculation > reading; . . .) across participants at the second level. Different approaches exist to protect the resulting statistical parametrical map (SPM) against the risk of multiple testing (a typical brain volume comprises ~60,000 voxels). In the resulting maps, each voxel is associated with a statistical significance value for a given contrast in the GLM (e.g., calculation > reading). The thresholded values can be projected on a brain template using a color code where significance ranges are associated with different colors (e.g., from red over orange and yellow to white).

Combining psychometric personality measures with fMRI has revealed that a wide range of functional responses in different regions are modulated by personality measures. In a recent review, Kennis and colleagues (2013) report numerous correlations with different scales of Gray's reinforcement sensitivity theory (McCrae and Costa 1987; McNaughton and Corr 2004; McNaughton and Gray 2000). Activity in the amygdala, ventral prefrontal cortex (vPFC), and the basal ganglia (i.e., striatum) has been associated with the behavioral approach system (BAS), in particular, in response to reward and expectance of reward. Reward expectancy was also associated with activity in anterior cingulate cortex (ACC). Less clear was the picture concerning the neural correlates of the behavioral inhibition system (BIS) and the fight-flight-or-freeze system (FFFS). Both appear to be correlated with activity in PFC during cognitive tasks and with negative stimuli such as punishment expectancy (Bruhl et al. 2011) or learning of negative emotional associations (Hooker et al. 2008).

Another approach exploits the fact that rCBF decreases upon repeated presentation of a given piece of information (adaptation or repetition suppression). Using such adaptation paradigms, several studies found ventral mPFC to be associated with the encoding of a person's traits (Heleven and Van Overwalle 2016; Ma et al. 2014).

Issues when Correlating Functional Measures with Personality Measures

Many of the issues when correlating structural information with personality measures hold when it comes to associations with functional MRI. That is, associating a given trait with a given ROI rests on the assumption that more activation in that ROI in a given task means that more intensive or efficient cognitive processing results from increased rCBF. For example, when reporting a correlation of amygdala activity during a fear learning task with high neuroticism, the authors assume that an "increased sensitivity in the neural mechanism for fear learning [. . .] leads to enhanced encoding of fear associations," which is, in turn, reflected on the neural level by a stronger BOLD response (p. 2709; Hooker et al. 2008). Yet, this is not necessarily the case and theoretically the opposite may be true; higher cortical efficiency may express via a reduced fMRI response, rather than an increased fMRI response.

Another problem arises from the idea of associating one region of the brain with one cognitive function (e.g., when stating that areas that are involved in reward processing correlate with extraversion). While a given brain area may contribute to the function at hand, it usually also contributes to a number of other functions which may or may not be relevant for the personality measure at hand. That is, picking the one function of an area that may be conceptually associated with a personality concept over-accentuates the area's functional selectivity.

Further, small sample sizes (e.g., below 20 participants in Brühl et al. 2011 and Hooker et al. 2008) and the association of broad high-level personality measures (e.g., neuroticism) with a single cognitive task (i.e., one learning experiment) that measures a given cognitive function may be problematic in terms of generalizability. Convergent evidence from multiple studies may alleviate this issue.

Vul and colleagues (2012) pointed to another theoretical issue arising from the notion that, theoretically, the correlation between any brain measure and any personality measure cannot exceed the product of their respective reliabilities. Vul and colleagues argue that a "non-independence error" is responsible for the fact that many empirical studies report values that exceeded this theoretical threshold. That is, voxels are selected based on whether or not their correlation with an external parameter exceeds a given statistical threshold. In a second step, a mean correlation is computed from the selected voxels only, leading to artificially inflated correlations because all non-significant voxels had been eliminated before.

Decoding Approach

Instead of statistically testing the significance of a given contrast in GLM for each voxel, decoding techniques such as multivoxel pattern analysis (MVPA) rely on supervised learning algorithms that operate on spatial patterns across an array of voxels (i.e., the features). On a trial-by-trial basis where each trial represents one exemplar, a statistical algorithm (e.g., support vector machines) is trained to differentiate between two (or more) experimental conditions (e.g., calculation vs. reading), such that the classifier learns to associate each pattern with one of the conditions. This is equivalent to searching for a hyperplane in feature space (where each feature represents one dimension) that ideally separates the experimental conditions. After training, the classifier is cross-validated with an unknown (i.e., independent) portion of the data for which it is asked to "predict" the true label (e.g., reading or calculation). This procedure is repeated while leaving out different parts of the data during training. Accuracy is averaged across repetitions and tested against chance level of classification (e.g., 50% for two conditions). Ideally, the accuracy reaches 100% correct. Here, voxel activity is used to predict experimental information (e.g., task). Decoding allows responding to a slightly different type of questions concerning the function of a given region of interest (ROI) in the brain (Haxby et al. 2014). While mass univariate analysis asks what a given ROI's function is, decoding allows analyzing what information is represented in a given ROI and how it is organized. For example, a given ROI may be equally and indistinguishably active both for addition and subtraction compared to reading. Yet, the representational patterns may still differ fundamentally and systematically between these arithmetic operations (Knops et al. 2009; Knops and Willmes 2014), affording decoding of arithmetic operations.

Decoding has been successfully applied to predict which of four characters participants were imagining based on activity patterns from medial prefrontal cortex (Hassabis et al. 2014). Characters' personalities differed along two traits (agreeableness and extraversion). Activity patterns in lateral temporal cortex and posterior cingulate cortex (pCC) allowed for predicting the degree of agreeableness and extraversion, respectively. Authors proposed that medial PFC encodes a complex personality model for others while lateral temporal cortex and pCC code for more specified personality traits (Hassabis et al. 2014).

Representational Similarity Analysis (RSA)

Representational similarity analysis (Kriegeskorte et al. 2008) seeks to analyze the state of the brain in response to a given stimulus, plan, decision, or planned action. It understands the ROI's representation as a point in multidimensional space. Voxels or neurons are the dimensions. Given two or more points in this space (representing two or more stimuli, plans, etc.) one may compute the representational distance between them as a proxy for the representational dissimilarity between them. When extending the stimulus space, one may compute a representational dissimilarity matrix (RDM), reflecting the pair-wise dissimilarity values between different stimuli (plans, decisions, etc.). For example, the RDM for six objects

(apple, pear, melon, mobile phone, screwdriver, and tennis ball) may reveal a higher-level semantic distinction between man-made objects versus natural objects.

This recent approach has been exploited to illustrate that similarities in subjective social space are mirrored on the neural level in left temporoparietal junction (TPJ), the left fusiform gyrus, and the subcallosal ventromedial prefrontal cortex (vmPFC; Dziura and Thompson 2017). Hence, learning about differences, similarities, and relations between others may be supported by these areas, authors conclude (Dziura and Thompson 2017).

Functional Connectivity

Most cognitive functions rely on the joint use of several interconnected brain regions. The domain of network neuroscience (Sporns and Betzel 2016) focuses on the analysis of the relation between brain regions that can be represented as a set of nodes and edges that form a network. Most approaches use the Pearson correlation of the time course between two (or more) foci in the brain in response to a given stimulus or task (functional connectivity or effective connectivity) or during a state of rest (resting state connectivity). Several approaches have been proposed.

Psycho-Physiological Interactions (PPI)

PPI (Friston et al. 1997) tests connectivity changes as a function of task condition. In other words, PPI analysis demonstrates functionally significant brain-wide connectivity changes in response to experimentally induced changes in a given seed ROI. The term "seed region" refers to any set of voxels that has been selected for conceptual reasons and for which the time course is extracted and entered to PPI analysis. Technically, the PPI regressor represents the product of the deconvolved ROI time course and the task regressor (Gitelman et al. 2003). For each voxel outside the ROI, the correlation with the PPI regressor is computed individually for each participant. The resulting maps are entered into a second level model (participant as random factor) to assess statistical significance of the observed connectivity changes on a group level.

PPI has been used to unravel the functional network that subserves the recognition of other persons based on information about these persons' bodies and traits (e.g., "He cut in front of the man in line" for an inconsiderate person; Greven et al. 2016). Authors argue for a "who" system that combines these pieces of information and comprises of fusiform gyrus (bodily appearance), and temporal poles and temporal-parietal junction as part of a network that makes inferences about other's thoughts and traits (Greven et al. 2016; Mitchell et al. 2002).

Dynamic Causal Modeling (DCM)

Dynamic causal modeling (DCM) aims at reconstructing how an observed pattern of activity has been produced by the interaction of distributed dynamical systems. To this aim, differential equations are used to define dynamic causal models, which, in turn, model latent states of nodes in a probabilistic graphic model. This requires the researcher to define a priori realistic models of brain regions that contribute to the task at hand and how these are interconnected. The observed data is used to test these models, that is, how the hidden states of each node map onto the measured responses. Bayesian model selection is used to select the best fitting and most parsimonious model that corresponds best to the observed data (Stephan et al. 2009). In contrast to PPI, DCM makes directional predictions (e.g., region A drives/influences region B).

Dima and colleagues (2015) used DCM to investigate the impact of the big five personality traits on effective connectivity in a working memory network (bilateral parietal cortex, anterior cingulate cortex, and dorsolateral prefrontal cortex). While neuroticism reduced short-term plasticity in this network, conscientiousness increased modulation of connectivity in this network (Dima et al. 2015).

Resting State fMRI

The brain is not always engaged in cognitive processing. A set of brain region has been shown to be most active when the participant is in a state

of mind wandering (Greicius et al. 2003; Raichle et al. 2001). This network comprises of posterior cingulate cortex, medial prefrontal cortex, angular gyrus, and retrosplenial cortex/precuneus. Two main approaches emerged and are continuously updated and enriched, independent component analysis (ICA) and seed-based analyses. Individual variation in resting state connectivity has been proposed as a potential biomarker for psychiatric disorders and response to treatment in a context of personalized psychiatry (Finn et al. 2015; Finn and Todd Constable 2016).

Seed-Based Analysis

Seed-based analysis is a model-based approach in which the time-course from an a-priori selected ROI (seed) is extracted and correlated with the time-course of all remaining voxels in the brain. As a result, a network of brain regions can be defined for which the time-course is highly correlated with each other. Major disadvantage of this approach is the highly subjective selection of a seed region that strongly influences the results.

This method was used to investigate the relation between DMN activity and stressor-evoked cardiovascular reactivity as a proxy for the emotional reactions to conflict which is, in turn, associated with agreeableness (Ryan et al. 2011). Ryan et al. (2011) found that more positive functional connectivity between posterior and anterior cingulate cortex correlated positively with agreeableness and mediated the relation between agreeableness and stressor-evoked cardiovascular reactivity. Connectivity between OFC and putamen was positively correlated with trait impulsivity, a concept from Gray's model of personality and addiction (Angelides et al. 2017; Franken et al. 2006).

Independent Component Analysis (ICA)

ICA is a mathematical technique to decompose a given (time-resolved) data set into a number of maximally independent components. In the context of fMRI, ICA is used to spatially separate regions of joint activity modulations that are maximally distinct from other regions. Major disadvantage is that the user needs to differentiate noise-based components from artifacts and actual functional components, which requires some experience and mathematical understanding. Major advantage is the data-driven and objective nature of the resulting componential structure.

Aberrant connectivity in the DMN is associated with psychiatric disorders such as borderline personality disorder and impulsivity (Wolf et al. 2011).

Cross-References

- ▶ Amygdala
- ▶ Anterior Cingulate Cortex
- ▶ BIS/BAS Systems
- ▶ Electroencephalography (EEG)
- ▶ Functional Magnetic Resonance Imaging (fMRI)
- ▶ Lateral Prefrontal Cortex (LPFC)
- ▶ Medial Prefrontal Cortex (MedPFC)
- ▶ Neuroscience of Personality and Individual Differences
- ▶ Orbitofrontal Cortex
- ▶ Prefrontal Cortex
- ▶ Temporoparietal Junction

References

Alexander, A. L., Lee, J. E., Lazar, M., & Field, A. S. (2007). Diffusion tensor imaging of the brain. *Neurotherapeutics, 4*(3), 316–329. https://doi.org/10.1016/j.nurt.2007.05.011.

Angelides, N. H., Gupta, J., & Vickery, T. J. (2017). Associating resting-state connectivity with trait impulsivity. *Social Cognitive and Affective Neuroscience, 12*, 1001. https://doi.org/10.1093/scan/nsx031.

Ashburner, J., & Friston, K. J. (2000). Voxel-based morphometry – the methods. *NeuroImage, 11*(6 Pt 1), 805–821. https://doi.org/10.1006/nimg.2000.0582.

Blankstein, U., Chen, J. Y., Mincic, A. M., McGrath, P. A., & Davis, K. D. (2009). The complex minds of teenagers: Neuroanatomy of personality differs between sexes. *Neuropsychologia, 47*(2), 599–603. https://doi.org/10.1016/j.neuropsychologia.2008.10.014.

Bjornebekk, A., Fjell, A. M., Walhovd, K. B., Grydeland, H., Torgersen, S., & Westlye, L. T. (2013). Neuronal correlates of the five factor model (FFM) of human personality: Multimodal imaging in a large healthy sample. *Neuroimage, 65*, 194–208. https://doi.org/10.1016/j.neuroimage.2012.10.009.

Bruhl, A. B., Viebke, M. C., Baumgartner, T., Kaffenberger, T., & Herwig, U. (2011). Neural

correlates of personality dimensions and affective measures during the anticipation of emotional stimuli. *Brain Imaging and Behavior, 5*(2), 86–96. https://doi.org/10.1007/s11682-011-9114-7.

Coutinho, J. F., Sampaio, A., Ferreira, M., Soares, J. M., & Goncalves, O. F. (2013). Brain correlates of pro-social personality traits: A voxel-based morphometry study. *Brain Imaging and Behavior, 7*(3), 293–299. https://doi.org/10.1007/s11682-013-9227-2.

DeYoung, C. G., Hirsh, J. B., Shane, M. S., Papademetris, X., Rajeevan, N., & Gray, J. R. (2010). Testing predictions from personality neuroscience. Brain structure and the big five. *Psychological Science, 21*(6), 820–828. https://doi.org/10.1177/0956797610370159.

Dima, D., Friston, K. J., Stephan, K. E., & Frangou, S. (2015). Neuroticism and conscientiousness respectively constrain and facilitate short-term plasticity within the working memory neural network. *Human Brain Mapping, 36*(10), 4158–4163. https://doi.org/10.1002/hbm.22906.

Donders, F. C. (1969). On the speed of mental processes. *Acta Psychologica, 30*, 412–431.

Dziura, S. L., & Thompson, J. C. (2017). The neural representational space of social memory. *bioRxiv*. https://doi.org/10.1101/130351.

Finn, E. S., Shen, X., Scheinost, D., Rosenberg, M. D., Huang, J., Chun, M. M., . . . Constable, R. T. (2015). Functional connectome fingerprinting: Identifying individuals using patterns of brain connectivity. Nature Neuroscience, 18(11), 1664–1671. https://doi.org/10.1038/nn.4135.

Finn, E. S., & Todd Constable, R. (2016). Individual variation in functional brain connectivity: Implications for personalized approaches to psychiatric disease. *Dialogues in Clinical Neuroscience, 18*(3), 277–287.

Franken, I. H., Muris, P., & Georgieva, I. (2006). Gray's model of personality and addiction. *Addictive Behaviors, 31*(3), 399–403. https://doi.org/10.1016/j.addbeh.2005.05.022.

Friston, K. J., Buechel, C., Fink, G. R., Morris, J., Rolls, E., & Dolan, R. J. (1997). Psychophysiological and modulatory interactions in neuroimaging. *NeuroImage, 6*(3), 218–229. https://doi.org/10.1006/nimg.1997.0291.

Gitelman, D. R., Penny, W. D., Ashburner, J., & Friston, K. J. (2003). Modeling regional and psychophysiologic interactions in fMRI: The importance of hemodynamic deconvolution. *NeuroImage, 19*(1), 200–207.

Good, C. D., Johnsrude, I. S., Ashburner, J., Henson, R. N., Friston, K. J., & Frackowiak, R. S. (2001). A voxel-based morphometric study of ageing in 465 normal adult human brains. *NeuroImage, 14*(1 Pt 1), 21–36. https://doi.org/10.1006/nimg.2001.0786.

Greicius, M. D., Krasnow, B., Reiss, A. L., & Menon, V. (2003). Functional connectivity in the resting brain: A network analysis of the default mode hypothesis. *Proceedings of the National Academy of Sciences of the United States of America, 100*(1), 253–258. https://doi.org/10.1073/pnas.0135058100.

Greven, I. M., Downing, P. E., & Ramsey, R. (2016). Linking person perception and person knowledge in the human brain. *Social Cognitive and Affective Neuroscience, 11*(4), 641–651. https://doi.org/10.1093/scan/nsv148.

Hassabis, D., Spreng, R. N., Rusu, A. A., Robbins, C. A., Mar, R. A., & Schacter, D. L. (2014). Imagine all the people: How the brain creates and uses personality models to predict behavior. *Cerebral Cortex, 24*(8), 1979–1987. https://doi.org/10.1093/cercor/bht042.

Haxby, J. V., Connolly, A. C., & Guntupalli, J. S. (2014). Decoding neural representational spaces using multivariate pattern analysis. *Annual Review of Neuroscience, 37*, 435–456. https://doi.org/10.1146/annurev-neuro-062012-170325.

Heleven, E., & Van Overwalle, F. (2016). The person within: Memory codes for persons and traits using fMRI repetition suppression. *Social Cognitive and Affective Neuroscience, 11*(1), 159–171. https://doi.org/10.1093/scan/nsv100.

Hooker, C. I., Verosky, S. C., Miyakawa, A., Knight, R. T., & D'Esposito, M. (2008). The influence of personality on neural mechanisms of observational fear and reward learning. *Neuropsychologia, 46*(11), 2709–2724. https://doi.org/10.1016/j.neuropsychologia.2008.05.005.

Hu, X., Erb, M., Ackermann, H., Martin, J. A., Grodd, W., & Reiterer, S. M. (2011). Voxel-based morphometry studies of personality: Issue of statistical model specification – effect of nuisance covariates. *NeuroImage, 54*(3), 1994–2005. https://doi.org/10.1016/j.neuroimage.2010.10.024.

Kennis, M., Rademaker, A. R., & Geuze, E. (2013). Neural correlates of personality: An integrative review. *Neuroscience and Biobehavioral Reviews, 37*(1), 73–95. https://doi.org/10.1016/j.neubiorev.2012.10.012.

Knops, A., Thirion, B., Hubbard, E. M., Michel, V., & Dehaene, S. (2009). Recruitment of an area involved in eye movements during mental arithmetic. *Science, 324*(5934), 1583–1585. https://doi.org/10.1126/science.1171599.

Knops, A., & Willmes, K. (2014). Numerical ordering and symbolic arithmetic share frontal and parietal circuits in the right hemisphere. *NeuroImage, 84*, 786–795. https://doi.org/10.1016/j.neuroimage.2013.09.037.

Kriegeskorte, N., Mur, M., & Bandettini, P. (2008). Representational similarity analysis - connecting the branches of systems neuroscience. *Frontiers in Systems Neuroscience, 2*, 4. https://doi.org/10.3389/neuro.06.004.2008.

Liu, W. Y., Weber, B., Reuter, M., Markett, S., Chu, W. C., & Montag, C. (2013). The big five of personality and structural imaging revisited: A VBM – DARTEL study. *Neuroreport, 24*(7), 375–380. https://doi.org/10.1097/WNR.0b013e328360dad7.

Ma, N., Baetens, K., Vandekerckhove, M., Kestemont, J., Fias, W., & Van Overwalle, F. (2014). Traits are represented in the medial prefrontal cortex: An fMRI adaptation study. *Social Cognitive and Affective Neuroscience, 9*(8), 1185–1192. https://doi.org/10.1093/scan/nst098.

Mahoney, C. J., Rohrer, J. D., Omar, R., Rossor, M. N., & Warren, J. D. (2011). Neuroanatomical profiles of personality change in frontotemporal lobar degeneration. *The British Journal of Psychiatry, 198*(5), 365–372. https://doi.org/10.1192/bjp.bp.110.082677.

McCrae, R. R., & Costa, P. T., Jr. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology, 52*(1), 81–90.

McNaughton, N., & Corr, P. J. (2004). A two-dimensional neuropsychology of defense: Fear/anxiety and defensive distance. *Neuroscience and Biobehavioral Reviews, 28*(3), 285–305. https://doi.org/10.1016/j.neubiorev.2004.03.005.

McNaughton, N., & Gray, J. A. (2000). Anxiolytic action on the behavioural inhibition system implies multiple types of arousal contribute to anxiety. *Journal of Affective Disorders, 61*(3), 161–176.

Mitchell, J. P., Heatherton, T. F., & Macrae, C. N. (2002). Distinct neural systems subserve person and object knowledge. *Proceedings of the National Academy of Sciences of the United States of America, 99*(23), 15238–15243. https://doi.org/10.1073/pnas.232395699.

Posner, M. I., Petersen, S. E., Fox, P. T., & Raichle, M. E. (1988). Localization of cognitive operations in the human brain. *Science, 240*(4859), 1627–1631.

Raichle, M. E., MacLeod, A. M., Snyder, A. Z., Powers, W. J., Gusnard, D. A., & Shulman, G. L. (2001). A default mode of brain function. *Proceedings of the National Academy of Sciences of the United States of America, 98*(2), 676–682. https://doi.org/10.1073/pnas.98.2.676.

Ryan, J. P., Sheu, L. K., & Gianaros, P. J. (2011). Resting state functional connectivity within the cingulate cortex jointly predicts agreeableness and stressor-evoked cardiovascular reactivity. *NeuroImage, 55*(1), 363–370. https://doi.org/10.1016/j.neuroimage.2010.11.064.

Sporns, O., & Betzel, R. F. (2016). Modular brain networks. *Annual Review of Psychology, 67*, 613–640. https://doi.org/10.1146/annurev-psych-122414-033634.

Stephan, K. E., Penny, W. D., Daunizeau, J., Moran, R. J., & Friston, K. J. (2009). Bayesian model selection for group studies. *NeuroImage, 46*(4), 1004–1017. https://doi.org/10.1016/j.neuroimage.2009.03.025.

Vul, E., & Pashler, H. (2012). Voodoo and circularity errors. *NeuroImage, 62*(2), 945–948. https://doi.org/10.1016/j.neuroimage.2012.01.027.

Wolf, R. C., Sambataro, F., Vasic, N., Schmid, M., Thomann, P. A., Bienentreu, S. D., & Wolf, N. D. (2011). Aberrant connectivity of resting-state networks in borderline personality disorder. *Journal of Psychiatry & Neuroscience, 36*(6), 402–411. https://doi.org/10.1503/jpn.100150.

Neurological Abnormalities

▶ Neurological Soft Signs

Neurological Signs

▶ Neurological Soft Signs

Neurological Soft Signs

Akin Ojagbemi
World Health Organization (W.H.O) collaborating centre for research and training in mental health, neuroscience, and substance abuse, Department of psychiatry, College of Medicine, University of Ibadan, Ibadan, Nigeria

Synonyms

Neurological abnormalities; Neurological signs; Soft neurological examination abnormalities; Soft signs

Definition

Neurological Soft Signs (NSS) are subtle neurological abnormalities that are observable on clinical examination. They often include impairment in fine motor and sensory functions, as well as persistence of primitive reflexes on neurological examination.

Introduction

Neurological soft signs are suggested when an individual shows demonstrable impairment in the ability to perform several motor and sensory tests on neurological examination. They are "soft" because they were originally thought to have nonspecific structural and functional brain correlates or characteristic of any specific neurological disorder. However, NSS are now known to result from the same changes in brain neuronal connections that are characteristics of many neuropsychiatric disorders. Along with abnormalities in brain structure and cognitive functions, NSS appear to predate onset of the relevant

neuropsychiatric disorder. The popular view is that the foundation for these abnormalities had been laid down at some point during the development of the brain and its connections. As such, NSS are seen as important early signs of an evolving disorder with a neurodevelopmental origin. A common example of such disorder is schizophrenia.

Historical Perspectives

Neurological abnormalities were part of early descriptions of the schizophrenia phenotype, formally known as "dementia praecox" according to Emil Kraepelin (1919). The term "soft sign," emerged from the inability of clinicians in the early days to locate the neuropathological bases and clinical relevance of some clinically evident neurological abnormalities. Traditional neurological examinations elicit gross signs of abnormalities, for example, visual field defects or hypotonia, which are often indicative of demonstrable lesion in the nervous system. Neurological soft signs, on the other hand, are seen in individuals with no obvious neuropathology. The exact relevance of these categories of abnormal findings on neurological examinations in the continuum from vulnerability to clinical and course characteristics of schizophrenia have only started to emerge in the recent era of genetic epidemiology and the identification of biological markers of vulnerability to neuropsychiatric disorders using advanced brain imaging, blood and cerebrospinal fluid examinations.

Neurobiological Bases of NSS

Evidence from multiple sources suggests that NSS predate the onset of some neuropsychiatric disorders, especially schizophrenia (Chan and Gottesman 2008; Serene et al. 2007). As an example, while NSS may decrease as the brain matures in healthy individuals, such decreases were not found in persons who later developed schizophrenia (Zabala et al. 2006). Additional neuroimaging support for this observation (Gay et al. 2013; Zhao et al. 2014) has prompted the suggestion that NSS may represent abnormalities in neuronal maturity and neural integration. Abnormal neuronal maturity and integration may be genetically determined or premorbidly acquired. Evidence that neuronal integration and NSS may be premorbidly acquired is found in their demonstrated association with obstetric complications (Peralta et al. 2011). Several other studies (Sanders et al. 2006; Xu et al. 2016) have also shown that NSS are associated with high heritability scores. Their prevalence in persons with schizophrenia and their first degree relative is consistent with the dose-response relationship often associated with familial aggregation.

Neuroimaging correlates: Neurological soft signs are associated with structural and functional changes in cortical and subcortical brain networks and connections responsible for the integration of motor and sensory processes such as the basal ganglia, prefrontal and temporal cortices, as well as the cerebellum (Gay et al. 2013; Zhao et al. 2014). Disruptions in interneuronal connectivity within and between these structures are thought to be manifest in key signs and symptoms of the relevant neuropsychiatric disorder including the NSS that are associated with them.

Measurement

The presence of abnormal NSS is determined based on reduced ability of an individual to perform a series of motor or sensory tests of a neurological examination. A variety of instruments have been developed for the measurement of NSS in the past over 30 years (Bombin et al. 2005). These include the Neurological Evaluation Scale (NES) (Buchanan and Heinrichs 1989), which is the most widely employed NSS measure in adult psychiatry. The quantified neurological scale (Convit et al. 1994), Heidelberg scale (Schroder et al. 1991), Cambridge neurological inventory, (Chen et al. 1995) and brief motor scale (Jahn et al. 2006) are the other scales that have been developed and used for the measurement of NSS in the literature. Most of these scales are composed of a heterogeneous inventory of neurological abnormalities.

Broad Classification

The varieties of neurological abnormalities represented in the different scales have also resulted in differences in the categorization of NSS. However, the most common way NSS has been classified is based on the presumed functional meanings of 13 items of neurological examination derived from the NES (Buchanan and Heinrichs 1989).

1. *Sensory integration*: Possibly reflecting a parietal lobe dysfunction and includes reduced ability to perform neurological examination tests such as bilateral extinction, agraphesthesia, astereognosis, right/left confusion, and impaired audiovisual integration.
2. *Motor coordination*: Possibly reflecting a dysfunction from the cerebellum and evidenced by reduced performance in test items such as tandem walk, finger to nose, finger to thumb opposition, and dysdiadochokinesis.
3. *Motor sequencing*: Possibly resulting from abnormalities in the complex connections between the basal ganglia and the frontal lobe and reflected in reduced performance in tests such as the fist ring, fist edge palm, and Ozerestski tests.

NSS and Schizophrenia

When considering all patients with schizophrenia, that is, first episode unmedicated, medicated patients, and/or those with chronic schizophrenia, a majority of studies report a prevalence of well over 50% with abnormal NSS, compared to about 5% in normal healthy controls (Chan and Chen 2007). However, a prevalence of around 90% has been reported in first episode unmedicated patients with disease (Ojagbemi et al. 2016; Zabala et al. 2006). It would appear that some NSS categories, for example, those reflecting abnormal sequencing of complex motor actions, are indicative of vulnerability to schizophrenia as they have been reported to be associated with genetic loading almost to a dose-response pattern of risk across individuals of various genetic identities from schizophrenia, first-degree relatives of patients, and normal controls (Xu et al. 2016), including those with schizophrenia spectrum disorders (Chan et al. 2015). However, as a group, they may also be associated with varying symptomatic states of schizophrenia, course and outcome characteristics of the disease (Ojagbemi et al. 2015; Prikryl et al. 2012).

NSS and Other Neuropsychiatric Disorders

Mood disorders: Very little differences were found in the prevalence of NSS in mood disorders compared with schizophrenia in some small studies that have compared NSS in mood disorders (i.e., bipolar affective disorders and depression), schizophrenia, and healthy controls (Boks et al. 2000; Negash et al. 2004). These findings initially appeared to contradict the assertion that NSS may represent important vulnerability marking signs specific to schizophrenia. However, an alternative view has been that the findings of only small differences in the profile of NSS in schizophrenia compared with mood disorders, as an example, may reflect the well-known genetic overlap in the vulnerability to both conditions (International Schizophrenia et al. 2009). It is important to point out that the specificity of NSS measurement in the context of depression is doubtful because lack of motivation in depressed patients may affect their ability to perform many of the neurological examination tests of NSS.

Cognitive disorders: Neurological soft signs, especially those requiring intact sensory and motor sequencing functions, have been shown in some studies to be associated with worse general cognitive performance in the context of disease and in health (Dazzan et al. 2008; Keshavan et al. 2003). For example, NSS were frequently found in older persons with Alzheimer's disease but not in those with mild cognitive impairment or normal controls (Urbanowitsch et al. 2015). In other studies, the severity of NSS also increased with severity of Alzheimer's disease (Seidl et al. 2009). These findings have often been interpreted to

mean that general cognitive function affects integration of sensory and motor information, and therefore, the NSS that related to those functions.

Neurological soft signs have also been reported in anxiety disorders, especially men with obsessive compulsive disorders (Peng et al. 2012), and in antisocial personality disorder where rates that are similar to those found in the broad categories of schizophrenia have been reported (Lindberg et al. 2004).

NSS in Healthy Individuals

Studies using normal healthy controls in comparison to schizophrenia have shown that NSS are also present in persons without disease. Prevalence rates of about 5% are most commonly reported in such studies (Chan and Chen 2007; Dazzan et al. 2006). While sensory integration abnormalities are common in healthy individuals, motor abnormalities were rarely found (Dazzan et al. 2006). Important differences in the brain localization of NSS in schizophrenia and healthy controls have also been reported in some studies (Dazzan et al. 2006; Dazzan et al. 2004).

Conclusion

Neurological Soft Signs are subtle but measurable neurological abnormalities. They are commonly classified into three broad categories with supposed functional relevance: sensory integration, motor in-coordination, and motor sequencing. They result from abnormal neuronal connectivity in several cortical and subcortical networks in brain. Such changes are similar to those that have been suggested to be the basis of schizophrenia. While they are also reported in other neuropsychiatric disorders and in healthy individuals, their meaning in this other contexts is yet unclear.

Cross-References

► Developmental Changes in Personality Traits

References

Boks, M. P., Russo, S., Knegtering, R., & van den Bosch, R. J. (2000). The specificity of neurological signs in schizophrenia: A review. *Schizophrenia Research, 43*(2–3), 109–116.

Bombin, I., Arango, C., & Buchanan, R. W. (2005). Significance and meaning of neurological signs in schizophrenia: Two decades later. *Schizophrenia Bulletin, 31*(4), 962–977. https://doi.org/10.1093/schbul/sbi028.

Buchanan, R. W., & Heinrichs, D. W. (1989). The Neurological Evaluation Scale (NES): A structured instrument for the assessment of neurological signs in schizophrenia. *Psychiatry Research, 27*(3), 335–350.

Chan, R. C., & Chen, E. Y. (2007). Neurological abnormalities in Chinese schizophrenic patients. *Behavioural Neurology, 18*(3), 171–181.

Chan, R. C., & Gottesman, I. I. (2008). Neurological soft signs as candidate endophenotypes for schizophrenia: A shooting star or a Northern star? *Neuroscience and Biobehavioral Reviews, 32*(5), 957–971. https://doi.org/10.1016/j.neubiorev.2008.01.005.

Chan, R. C., Xie, W., Geng, F. L., Wang, Y., Lui, S. S., Wang, C. Y., . . ., Rosenthal, R. (2015). Clinical utility and lifespan profiling of neurological soft signs in schizophrenia spectrum disorders. *Schizophrenia Bulletin*, *42*(3):560–570 https://doi.org/10.1093/schbul/sbv196

Chen, E. Y., Shapleske, J., Luque, R., McKenna, P. J., Hodges, J. R., Calloway, S. P., . . ., Berrios, G. E. (1995). The Cambridge Neurological Inventory: A clinical instrument for assessment of soft neurological signs in psychiatric patients. *Psychiatry Research, 56*(2), 183–204.

Convit, A., Volavka, J., Czobor, P., de Asis, J., & Evangelista, C. (1994). Effect of subtle neurological dysfunction on response to haloperidol treatment in schizophrenia. *The American Journal of Psychiatry, 151*(1), 49–56. https://doi.org/10.1176/ajp.151.1.49.

Dazzan, P., Lloyd, T., Morgan, K. D., Zanelli, J., Morgan, C., Orr, K., . . ., Murray, R. M. (2008). Neurological abnormalities and cognitive ability in first-episode psychosis. *The British Journal of Psychiatry, 193*(3), 197–202. https://doi.org/10.1192/bjp.bp.107.045450

Dazzan, P., Morgan, K. D., Chitnis, X., Suckling, J., Morgan, C., Fearon, P., . . ., Murray, R. M. (2006). The structural brain correlates of neurological soft signs in healthy individuals. *Cerebral Cortex, 16*(8), 1225–1231. https://doi.org/10.1093/cercor/bhj063

Dazzan, P., Morgan, K. D., Orr, K. G., Hutchinson, G., Chitnis, X., Suckling, J., . . ., Murray, R. M. (2004). The structural brain correlates of neurological soft signs in AESOP first-episode psychoses study. *Brain, 127* (Pt 1), 143–153. https://doi.org/10.1093/brain/awh015

Gay, O., Plaze, M., Oppenheim, C., Mouchet-Mages, S., Gaillard, R., Olie, J. P., . . ., Cachia, A. (2013). Cortex morphology in first-episode psychosis patients with neurological soft signs. *Schizophrenia Bulletin, 39*(4), 820–829. https://doi.org/10.1093/schbul/sbs083

International Schizophrenia Consortium, Purcell, S. M., Wray, N. R., Stone, J. L., Visscher, P. M., O'Donovan, M. C., . . ., Sklar, P. (2009). Common polygenic variation contributes to risk of schizophrenia and bipolar disorder. *Nature, 460*(7256), 748–752. https://doi.org/10.1038/nature08185

Jahn, T., Cohen, R., Hubmann, W., Mohr, F., Kohler, I., Schlenker, R., . . ., Schroder, J. (2006). The Brief Motor Scale (BMS) for the assessment of motor soft signs in schizophrenic psychoses and other psychiatric disorders. *Psychiatry Research, 142*(2–3), 177–189. https://doi.org/10.1016/j.psychres.2002.12.002

Keshavan, M. S., Sanders, R. D., Sweeney, J. A., Diwadkar, V. A., Goldstein, G., Pettegrew, J. W., & Schooler, N. R. (2003). Diagnostic specificity and neuroanatomical validity of neurological abnormalities in first-episode psychoses. *The American Journal of Psychiatry, 160*(7), 1298–1304.

Kraepelin, E. (1919). *Dementia praecox and paraphraenia.* (trans: R. M. Barclay & G. M. Robertson) (G. M. Robertson, Ed.). New York: Robert E. Kreiger.

Lindberg, N., Tani, P., Stenberg, J. H., Appelberg, B., Porkka-Heiskanen, T., & Virkkunen, M. (2004). Neurological soft signs in homicidal men with antisocial personality disorder. *European Psychiatry, 19*(7), 433–437. https://doi.org/10.1016/j.eurpsy.2004.05.011.

Negash, A., Kebede, D., Alem, A., Melaku, Z., Deyessa, N., Shibire, T., . . ., Kullgren, G. (2004). Neurological soft signs in bipolar I disorder patients. *Journal of Affective Disorders, 80*(2–3), 221–230. https://doi.org/10.1016/S0165-0327(03)00116-2

Ojagbemi, A., Chiliza, B., Bello, T., Asmal, L., Esan, O., Emsley, R., & Gureje, O. (2016). The expression of neurological soft signs in two african populations with first-episode schizophrenia. *Transcultural Psychiatry* (in press).

Ojagbemi, A., Esan, O., Emsley, R., & Gureje, O. (2015). Motor sequencing abnormalities are the trait marking neurological soft signs of schizophrenia. *Neuroscience Letters, 600*, 226–231. https://doi.org/10.1016/j.neulet.2015.06.028.

Peng, Z. W., Xu, T., Miao, G. D., He, Q. H., Zhao, Q., Dazzan, P., & Chan, R. C. (2012). Neurological soft signs in obsessive-compulsive disorder: The effect of co-morbid psychosis and evidence for familiality. *Progress in Neuro-Psychopharmacology & Biological Psychiatry, 39*(1), 200–205. https://doi.org/10.1016/j.pnpbp.2012.06.015.

Peralta, V., de Jalon, E. G., Campos, M. S., Basterra, V., Sanchez-Torres, A., & Cuesta, M. J. (2011). Risk factors, pre-morbid functioning and episode correlates of neurological soft signs in drug-naive patients with schizophrenia-spectrum disorders. *Psychological Medicine, 41*(6), 1279–1289. https://doi.org/10.1017/S0033291710001856.

Prikryl, R., Ceskova, E., Tronerova, S., Kasparek, T., Kucerova, H. P., Ustohal, L., . . ., Vrzalova, M. (2012). Dynamics of neurological soft signs and its relationship to clinical course in patients with first-episode schizophrenia. *Psychiatry Research, 200*(2–3), 67–72. https://doi.org/10.1016/j.psychres.2012.03.008

Sanders, R. D., Joo, Y. H., Almasy, L., Wood, J., Keshavan, M. S., Pogue-Geile, M. F., . . ., Nimgaonkar, V. L. (2006). Are neurologic examination abnormalities heritable? A preliminary study. *Schizophrenia Research, 86*(1–3), 172–180. https://doi.org/10.1016/j.schres.2006.06.012

Schroder, J., Niethammer, R., Geider, F. J., Reitz, C., Binkert, M., Jauss, M., & Sauer, H. (1991). Neurological soft signs in schizophrenia. *Schizophrenia Research, 6*(1), 25–30.

Seidl, U., Thomann, P. A., & Schroder, J. (2009). Neurological soft signs in nursing home residents with Alzheimer's disease. *Journal of Alzheimer's Disease, 18*(3), 525–532. https://doi.org/10.3233/JAD-2009-1159.

Serene, J. A., Ashtari, M., Szeszko, P. R., & Kumra, S. (2007). Neuroimaging studies of children with serious emotional disturbances: A selective review. *Canadian Journal of Psychiatry, 52*(3), 135–145.

Urbanowitsch, N., Degen, C., Toro, P., & Schroder, J. (2015). Neurological soft signs in aging, mild cognitive impairment, and Alzheimer's disease – The impact of cognitive decline and cognitive reserve. *Frontiers in Psychiatry, 6*, 12. https://doi.org/10.3389/fpsyt.2015.00012.

Xu, T., Wang, Y., Li, Z., Huang, J., Lui, S. S., Tan, S. P., . . ., Chan, R. C. (2016). Heritability and familiality of neurological soft signs: Evidence from healthy twins, patients with schizophrenia and non-psychotic first-degree relatives. *Psychological Medicine, 46*(1), 117–123. https://doi.org/10.1017/S0033291715001580

Zabala, A., Robles, O., Parellada, M., Moreno, D. M., Ruiz-Sancho, A., Burdalo, M., . . ., Arango, C. (2006). Neurological soft signs in adolescents with first episode psychosis. *European Psychiatry, 21*(5), 283–287. https://doi.org/10.1016/j.eurpsy.2005.09.006

Zhao, Q., Li, Z., Huang, J., Yan, C., Dazzan, P., Pantelis, C., . . ., Chan, R. C. (2014). Neurological soft signs are not "soft" in brain structure and functional networks: Evidence from ALE meta-analysis. *Schizophrenia Bulletin, 40*(3), 626–641. https://doi.org/10.1093/schbul/sbt063

Neuroplasticity

▶ Molecular Cellular Cognition

Neuroplasticity Phenotypic Plasticity

▶ Developmental Plasticity

Neuroscience of Personality and Individual Differences

Jaanus Harro
Division of Neuropsychopharmacology, Department of Psychology, Estonian Centre of Behavioural and Health Sciences, University of Tartu, Tartu, Estonia

Definition

Research aimed at discovery and description of the biological substrate of relatively persistent behavioral traits.

Introduction

Interindividual differences in personality and behavior must derive from underlying variations in the brain. At present, knowledge on the neurobiological foundation of persistent individual differences consists of highly fragmented pieces of information and does not allow a single coherent theory. The following summary represents a selection of evidence that may be helpful in developing such a theory that had the power of making predictions on future behavior, and points at some significant gaps that research must fill in order to proceed.

Neuroscience embraces the vast complexity of the brain and the large variety of different methods for probing its structure and function, ranging from systems analysis to the molecular level. All this is applied in combination with the multitude of human personality theories or is addressing specific less or more complex traits of particular interest, and can be taxing either healthy mental condition or something out of the variety of mental health pathologies. Furthermore, quite a large number of approaches to study the neural underpinnings of individual differences are carried out in animals, and attempts to translate from other species to humans and vice versa have become the mainstream in neurosciences. Hence, the sheer diversity of the available information is mind-boggling and much of it is unlikely to be the final word on the neural basis of individual differences.

A Neuroanatomical View on Individual Differences Represented in the Brain

Neuroscience operates at a variety of organizational levels. At the macroscopic level of brain regions and their connectivity, recent technological developments have brought research on the living brain to a qualitatively new state and provide excellent tools for the study on neurobiology of human behavioral traits. The findings obtained with methods such as structural and functional magnetic brain imaging and diffusion tensor imaging suggest that major personality traits in humans can be linked to brain structure, metabolic activation, and structural and functional connectivity. For example, the Big Five personality traits have been associated with volume of a number of brain regions (DeYoung et al. 2010), while most of the trait-related areas were cortical or cerebellar. A recent meta-analysis with focus on traits in several personality taxonomies but all representing negative emotionality (Mincic 2015) has suggested that high negative emotionality is associated with lower gray matter volume in left orbitofrontal cortex and perigenual anterior cingulate cortex, but higher gray matter volume in left amygdala and anterior parahippocampal gyrus. Into the realm of negative emotionality also belong the studies on inhibited temperament (Clauss et al. 2015) that have also found hyperreactivity of amygdala to play a central role, as well as altered functional connectivity between prefrontal cortex and basal ganglia.

A contrast to negative emotionality, positive emotionality, has often been viewed as represented in the construct of extraversion, and linked with high dopaminergic function (Depue et al. 1994) of the mesotelencephalic pathway from the ventral tegmental area and substantia nigra to limbic areas such as striatum and nucleus accumbens, and to the frontal cortical areas. Others maintain that dopamine is a necessary but not sufficient factor in experiencing positive

emotion and other neurochemical mechanisms in the limbic system, notably several neuropeptides, are implicated (Panksepp 1998).

Variation in the networks of negative and positive affect taken to extreme is reflected in conditions that are considered pathological. Negative emotionality is positively associated with development of mood and anxiety disorders, and there is a genetic common ground for traitwise negative emotionality and these disorders. Studies on patients have yielded in compatible neurobiological findings. Psychopathic traits that are the core of antisocial behavior develop in early age, whereas reduced empathy when others are at distress is based on reduced responsiveness of amygdala to relevant cues; this, however, appears together with alterations in decision-making abilities and behavioural flexibility owing to deficits in function of ventromedial prefrontal cortex and striatum (Blair 2013).

From Genes to Brain Systems

The heritable component of the individual differences is emerging from the genetic information of the individuals, and also the developmental and acquired aspects of persistent traits ought be residing on metastability of gene expression. At the genetic level, systematic review of literature has not detected any strong relationship of variants of a single gene with personality while using models of either Cloninger, Eysenck, or Costa and McCrae (Balestri et al. 2014). Similar systematic approaches to the literature on the level of neurochemistry are missing but also appear to be unlikely to detect any consistent and strong association between personality and a single molecule. This absence of any single simple uncontested association despite of massive research efforts suggests that the persistent aspects in the specific traits under investigation are emerging from a highly complex molecular and cellular arrangement, and within general population any trait can probably raise from many different constellations at the molecular level. Studies on individual differences in intelligence have reached a similar conclusion that while the efficiency of the brain provides a uniform correlate to intelligence and activity in parietal-frontal pathways is important for this, there are many neuronal roads to intelligence (Deary et al. 2010).

Some of the personality models have kept the neurobiological underpinnings in mind since the beginning or have even been conceived after substantial empirical brain research. The approach/avoidance systems research by Gray has led to scales measuring behavioral activation versus inhibition as separate neural systems, and the tridimensional model of Cloninger (Cloninger et al. 1993) was based on the available neurochemical information regarding the three wide-spread monoaminergic systems of the brain, linking novelty seeking to dopamine, harm avoidance to serotonin, and reward dependence to noradrenaline. Further, a powerful attempt of bottom-up personality scale building has been made by compilation of the Affective Neuroscience Personality Scale (ANPS; Davis and Panksepp 2011) that explicitly derives from the predefined emotive systems as discovered in systematic and detailed neurobiological studies on animals (Panksepp 1998). Traits specified and defined in this way have all been characterized in terms of species-specific behavior, neuroanatomical networks, and neurochemical regulation with unprecedented detail, while the chemical neuroanatomy of the model still requires further refinement. Representing six out of seven primary neurobiologically well-defined emotional-motivational systems, SEEKING, FEAR, ANGER, SADNESS, CARING, and PLAY, the ANPS has appeared as a promising tool in human genetic and brain imaging studies (Montag and Reuter 2014), but further investigations remain expected to clarify the eventual value of this approach.

Broad categories of behavior, such as aggressiveness, have been more successfully related to broadly defined neurobiological mechanisms such as serotonergic function.

The vast majority of molecular genetic research of individual differences has been on targets in the dopamine and serotonin systems (Montag and Reuter 2014). Quite a substantial share of this effort is owing to the discovery of a few gene variants that have small but significant

effects in meta-analyses but appear to be nominally associated with a large variety of different behavioral measures. An outstanding example is the promoter polymorphism of the serotonin transporter gene, the short variant of the polymorphic region being associated with less efficient transcription of the gene leading to lower expression, and higher levels of neuroticism, anxiety, and depression (Lesch et al. 1996). This promoter polymorphism has remained the most investigated genetic variation in neuroscience, despite the inconsistent association with each of the many personality and behavioral variables it has been linked to, probably owing to certain advantages comprised in hypervigilance produced by the "risk" genotype (Homberg and Lesch 2011) and to gene–environment interactions leading to adaptive changes that compensate for the potential disadvantages carried with the "risk" genotype (Harro 2010).

The behavioral plasticity associated with common gene variants should not lead to underestimation of the potentially major effects that a variation in a single gene with large neurochemical implications can elicit on human behavior. An exemplary case is the Brunner syndrome, resulting from a single nucleotide mutation that was causal to preventing the expression of the monoamine oxidase A (*MAOA*) gene, with resulting absence of MAO-A enzyme activity throughout life course and expression of borderline mental retardation, limited impulse control, and violent outbursts precipitated by unexpected events in all male subjects who had the mutated variant of this X-chromosomal gene (Brunner et al. 1993). MAO-A is an enzyme with critically important role in breaking down the neurotransmitters such as serotonin, noradrenaline, and dopamine, and by this means has a large effect on real-time neurotransmission but also on brain maturation during the early development of the nervous system. Subsequently, a common variable number of tandem repeat (VNTR) polymorphism was identified in the promoter region of the *MAOA* gene, with certain alleles leading to higher versus lower expression in vitro. Alleles classified into the low activity *MAOA* genotype are associated with lower gray matter volume in the limbic regions and carriers of the *MAOA*-L alleles have diminished responses to angry and fearful faces in the prefrontal cortex but increased responses in the amygdala (Buckholtz and Meyer-Lindenberg 2008). *MAOA*-L subjects express higher levels of impulsivity, higher aggressiveness upon provocation, and they are more prevalent among subjects who have shown antisocial behavior, including extreme risk-taking and violence. Of note, differences in cerebral responses and higher impulsivity and violence of the *MAO*-L subjects appears as specific to males.

Neuroscience has paid much attention to the concept of sensation-seeking behavior, and this has been associated with high dopaminergic (Norbury and Husain 2015) and low serotonergic (Zuckerman 1993) function. Especially, the latter has quite consistently been considered a causal factor of impulsivity, even though the large picture is more complex. Impulsivity can be meaningfully subcategorized and the complexity of the serotonergic system (not only are the projection areas and behavioral functions of different serotonergic cell groups distinct, but at least 14 subtypes of 5-HT receptors exist and some act as postsynaptic as well as release-inhibitory receptors) allows for distinct connection between varieties of impulsivity and corresponding aspects of 5-HT neurobiology (Evenden 1999). An indirect measure of the overall capacity of serotonin release in the brain, monoamine oxidase activity in platelets that is likely to reflect the early developmental state of the serotonin system, has quite consistently been found in association with impulse control related complex behaviors (Harro and Oreland 2016). Thus, subjects with low platelet MAO activity and presumably lower capacity of the serotonergic system exhibit higher impulsivity scores, engage more frequently in behaviors associated with high impulsivity and excessive risk-taking, and are overrepresented in groups with serious behavioral deviations. High platelet MAO activity has, in turn, been linked to higher neuroticism.

Impulsivity has emerged as a meaningful construct that can be further dissected into facets and subsequently translationally studied in humans and other species, providing the window to the

cellular level and chemical neuroanatomy of the trait. Not unexpectedly, upon close examination the neurobiology underlying impulsive traits has appeared more complex and has besides dopamin- and serotonergic systems included information on other neurochemical systems that use noradrenaline, glutamate, or endocannabinoids (Pattij and Vanderschuren 2008).

Fine-tuning of neural activity is supported by neurochemical systems with lower abundance but high receptor affinity, most prominently by neuropeptides. Personality research has recently implicated neuropeptides such as oxytocin, arginine vasopressin, and neuropeptide Y (Montag and Reuter 2014), but many others are likely to make a significant contribution to individual differences (Panksepp 1998; Harro 2010). Some of the neuropeptides involved in regulation of hormonal regulation via blood or acting as hormones themselves have been found to function as neurotransmitters in the brain within well-defined neuronal circuits. Oxytocin is an example that has received much attention recently: This nonapeptide is released from the posterior lobe of the pituitary gland and acts as a hormone but hypothalamic projections to several brain regions such as prefrontal cortex, amygdala, lateral septum, bed nucleus of stria terminalis, and hippocampus. Oxytocin-mediated neurotransmission may shape the variability in social affiliation related traits but also by moderating dopaminergic function the reward-related behaviors in a more general manner (Love 2014).

Gene–Environment Interplay

Interestingly, both high dopaminergic and low serotonergic function that together may bring about maladaptive behavioral choices are observed in animals after postweaning social isolation (Hall and Perona 2012). Gene–environment interaction studies have become the mainstream in behavioral genetics after the reports by Caspi and coworkers (Caspi et al. 2002, 2003) on the moderating effects of common gene variants on the impact that life events can have on the development of aggressive and antisocial behaviour and depressive traits. How exactly do the impacts of life events and persistent environmental variables become established at the molecular level remains to be clarified but implies the level above the nucleotide sequence of the DNA, referred to as epigenetic changes. Epigenetic mechanisms can include chromatin remodeling, methylation, and acetylation of histone packaging that facilitate gene promotion, and addition of methyl groups to structural DNA and production and binding of micro-RNA-s that silence gene expression. Such regulatory processes have been found to be essential for the development and function of all tissues, including the CNS, are developmentally dynamic, and serve as a basic mechanism for long-term control of gene expression, likely to often overrule the effect of the variations in the coding DNA sequence or in its promoter region. The methylation patterns may well themselves be heritable as well as have random change components, but often are strongly specifically affected by different aspects of environment. For example, methylation of the dopamine D_4 receptor gene (*DRD4*), a gene that has been associated with attention deficit hyperactivity disorder but also with curiosity, was found as largely driven by shared family environment in a twin study, but the methylation of the serotonin transporter promoter was largely dependent on unique, nonshared environmental effects (Wong et al. 2010).

What would be the mediating mechanism from the environment to DNA is also not known, but is likely to involve the known physiological mechanisms of stress response. Animal research has described that maternal care can produce behavioral changes lasting to adulthood by means of epigenetic modification of glucocorticoid receptor gene in the brain (Weaver et al. 2004). This would be likely to affect the reliability of the negative feedback loop that limits the release of cortisol, a hormone released from the adrenal glands as part of an adaptive, homeostatic reaction to a large variety of external and internal challenges. Because hormones, carried in bloodstream, can reach multiple targets almost simultaneously they can serve as universal messengers to many physiological circuits that are involved in trait-wise responses. Several hormones have both

rapid effects mediated by membrane targets and more long-term and persistent effects via binding to intracellular receptors and impacting on gene expression. Amongst associations of behavioral traits with hormone secretion, the relationship between aggressiveness and testosterone has received most attention. While the many attempts to show that higher testosterone levels lead to higher aggressiveness have revealed only a very weak positive correlation, this association could be stronger in specific conditions, and surges of testosterone do predict future aggressive behavior and enhance threat-related activation of the amygdala (Carré and Olmstead 2015). The development of social neuroscience has attempted to place testosterone as a source of individual differences into a broader context as playing a role in motivation to achieve and maintain high social status (Eisenegger et al. 2011), this, of course, being well compatible with a nonlinear and time-dependent association of hormone levels with specific complex behaviors such as aggression.

Developmental Aspects and the Sex/Gender Perspective

Many of the genetic effects as well as outcomes of epigenetic programming that are observable throughout life cycle may have occurred already at prenatal and perinatal stage (Harro and Oreland 2016). For example, the *MAOA* VNTR genotype does not explain MAO-A protein levels in the adult brain as measured by positron emission tomography, and while MAO-B activity in platelets covaries with risk-taking behaviors in adulthood, there is no correlation with MAO-B activity in the brain. Indeed, MAO-B activity levels appear to have little effect on monoamine metabolism if MAO-A activity is preserved. The notion that MAO activity during fetal period is an important contributor to individual differences is supported by animal studies showing the aggressiveness-increasing effect of MAO-A inhibitors if administered during gestation but not in adulthood, and by clinical experience that treatment of depressed patients with MAO inhibitors does not appear to change personality. In the mature brain, MAO-A levels are strongly associated with promoter methylation and hence subject to large variation as the methylation pattern has been found to profoundly change in development (Wong et al. 2010).

Evidence that methylation levels of many key genes of major neurochemical systems changes significantly over a few years already in early childhood, and that methylation profiles are very different even in monozygotic twins owing to the impact of environmental factors (Wong et al. 2010) suggests that environmental factors play a crucial dynamic role in shaping the behavioral traits by influencing gene expression. As several animal studies have revealed, alterations of gene expression are often associated with behavioral *stability* under environmental pressures (Harro and Oreland 2016). Because the environmental impacts are of different qualitative and quantitative types, the response modes maintaining homeostasis must be manifold.

In this context, it should be acknowledged that male and female individuals differ not only by certain genetically determined biological features but are, in everyday life, confronted by environmental signals that are different within many if not all cultures. At the gene–environment interaction process, the significance of sex as biological and gender as cultural construct become intertwined. Studies on general intelligence have reached the conclusion that in males and females intelligence co-varies with different measures of regional gray matter volume, cortical thickness, and white matter volume and integrity, leading to a conclusion that males and females can achieve similar levels of intelligence by using differently structured neural systems in different ways (Deary et al. 2010). Similar are the findings in studies on behavioral differences and major functional gene variants, most notably with the *MAOA* VNTR genotype, in which case, quite consistently, aggressive traits are associated with childhood adversity, and with the *MAOA*-L genotype in males but with the *MAOA*-H genotype in females (Harro and Oreland 2016). Neuroimaging has revealed compatible distinct patterns in activation of amygdala, hippocampus, and anterior cingulate

cortex as early stressful events drive dysfunctional responses in *MAOA*-L males and *MAOA*-H females.

It should however be made clear that for the common functional gene variants often labeled as "risk" genotypes, evidence instead supports a role as plasticity genotype: carriers of plasticity alleles would be heavily hit in unfavorable conditions but well equipped to take advantage of supportive environment (Belsky et al. 2009). No biological mechanism that would be universally maladaptive would survive environmental pressure so each variant that can be associated with a trait apparently less adaptive must be either exceedingly rare or permit balanced adaptive responses. Indeed, it may follow that a large share of individual differences are caused by unique, family-specific genetic constellations (Homberg and Lesch 2011). The common genetic "risk" variants such as the s-allele of the serotonin transporter polymorphism promote developmental trajectories that are environmentally shaped to fit in. Nevertheless, if the negative impact of environment can not be compensated for, the common variants can be causally related to maladaptive traits.

Conclusion

Neuroscience has described associations with persistent behavioral traits at different levels from molecular to systems, but currently the landscape of knowledge remains fragmented. It has, however, been found that phenotype is not strictly predicted by the genotype, and that variability of the phenotype from a genotype can be huge, with even opposing solutions if the environmental pressures during development facilitate this (Hall and Perona 2012). Because of the multitude of constructs under investigation, and the many factors that correlate and interact with each other throughout the life course, neurobiology of individual differences should embrace formal modeling that includes the epistatic, hierarchical, dynamic, and homeostatic nature of interaction between genetic factors, environments, endophenotypes, and behaviors (Harro 2010).

References

Balestri, M., Calati, R., Serretti, A., & De Ronchi, D. (2014). Genetic modulation of personality traits: A systematic review of the literature. *International Clinical Psychopharmacology, 29*, 1–15.

Belsky, J., Jonassaint, C., Pluess, M., Stanton, M., Brummett, B., & Williams, R. (2009). Vulnerability genes or plasticity genes? *Molecular Psychiatry, 14*, 746–754.

Blair, R. J. (2013). The neurobiology of psychopathic traits in youths. *Nature Reviews Neuroscience, 14*, 786–799.

Brunner, H. G., Nelen, M., Breakefield, X. O., Ropers, H. H., & van Oost, B. A. (1993). Abnormal behavior associated with a point mutation in the structural gene for monoamine oxidase. *Science, 262*, 578–580.

Buckholtz, J. W., & Meyer-Lindenberg, A. (2008). *MAOA* and the neurogenetic architecture of human aggression. *Trends in Neurosciences, 31*, 120–129.

Carré, J. M., & Olmstead, N. A. (2015). Social neuroendocrinology of human aggression: Examining the role of competition-induced testosterone dynamics. *Neuroscience, 286*, 171–186.

Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., et al. (2002). Role of genotype in the cycle of violence in maltreated children. *Science, 297*, 851–854.

Caspi, A., Sugden, K., Moffitt, T. E., Taylor, A., Craig, I. W., Harrington, H., et al. (2003). Influence of life stress on depression: Moderation by a polymorphism in the 5-HTT gene. *Science, 301*, 386–389.

Clauss, J. A., Avery, S. N., & Blackford, J. U. (2015). The nature of individual differences in inhibited temperament and risk for psychiatric disease: A review and meta-analysis. *Progress in Neurobiology, 127-128*, 23–45.

Cloninger, C. A., Svrakic, D. M., & Przybeck, T. R. (1993). A psychobiological model of temperament. *Archives of General Psychiatry, 50*, 975–990.

Davis, K. L., & Panksepp, J. (2011). The brain's emotional foundations of human personality and the Affective Neuroscience Personality Scale. *Neuroscience & Biobehavioral Reviews, 35*, 1946–1958.

Deary, I. J., Penke, L., & Johnson, W. (2010). The neuroscience of human intelligence differences. *Nature Reviews Neuroscience, 11*, 201–211.

Depue, R. A., Luciana, M., Arbisi, P., Collins, P., & Leon, A. (1994). Dopamine and the structure of personality: Relation of agonist-induced dopamine activity to positive emotionality. *Journal of Personality and Social Psychology, 67*, 485–498.

DeYoung, C. G., Hirsh, J. B., Shane, M. S., Papademetris, X., Rajeevan, N., & Gray, J. R. (2010). Testing predictions from personality neuroscience. Brain structure and the big five. *Psychological Science, 21*, 820–828.

Eisenegger, C., Haushofer, J., & Fehr, E. (2011). The role of testosterone in social interaction. *Trends in Cognitive Sciences, 15*, 263–271.

Evenden, J. L. (1999). Varieties of impulsivity. *Psychopharmacology, 146*, 348–361.
Hall, F. S., & Perona, M. T. G. (2012). Have studies of the developmental regulation of behavioral phenotypes revealed the mechanisms of gene-environment interactions? *Physiology & Behavior, 107*, 623–640.
Harro, J. (2010). Inter-individual differences in neurobiology as vulnerability factors for affective dsorders: Implications for psychopharmacology. *Pharmacology & Therapeutics, 125*, 402–422.
Harro, J., & Oreland, L. (2016). The role of MAO in personality and drug use. *Progress in Neuro-Psychopharmacology & Biological Psychiatry, 69*, 101–111.
Homberg, J. R., & Lesch, K. P. (2011). Looking on the bright side of serotonin transporter gene variation. *Biological Psychiatry, 69*, 513–519.
Lesch, K. P., Bengel, D., Heils, A., Sabol, S. Z., Greenberg, G. D., Petri, S., et al. (1996). *Science, 274*, 1527–1531.
Love, T. M. (2014). Oxytocin, motivation and the role of dopamine. *Pharmacology, Biochemistry, and Behavior, 119*, 49–60.
Mincic, A. (2015). Neuroanatomical correlates of negative emotionality-related traits: A systematic review and meta-analysis. *Neuropsychologia, 77*, 97–118.
Montag, C., & Reuter, M. (2014). Disentangling the molecular genetic basis of personality: From monoamines to neuropeptides. *Neuroscience and Biobehavioral Reviews, 43*, 228–239.
Norbury, A., & Husain, M. (2015). Sensation-seeking: Dopaminergic modulation and risk for psychopathology. *Behavioural Brain Research, 288*, 79–93.
Panksepp, J. (1998). *Affective neuroscience: The foundations of human and animal emotions*. Oxford, UK: Oxford University Press.
Pattij, T., & Vanderschuren, L. J. M. J. (2008). The neuropharmacology of impulsive behaviour. *Trends in Pharmacological Sciences, 29*, 192–199.
Weaver, I. C., Cervoni, N., Champagne, F. A., D'Alessio, A. C., Sharma, S., Seckl, J. R., & Meaney, M. J. (2004). Epigenetic programming by maternal behavior. *Nature Neuroscience, 7*, 847–854.
Wong, C. C. Y., Caspi, A., Williams, B., Craig, I. W., Houts, R., Ambler, A., et al. (2010). A longitudinal study of epigenetic variation in twins. *Epigenetics, 5*, 516–526.
Zuckerman, M. (1993). P-impulsive sensation seeking and its behavioral, psychophysiological and biochemical correlates. *Neuropsychobiology, 28*, 30–36.

Neurosis

► Fixation

Neurosis and Neurotic Conflict

Jack Danielian[1] and Patricia Gianotti[2]
[1]The American Institute for Psychoanalysis, Karen Horney Center, New York, NY, USA
[2]Woodland Professional Associates, North Hampton, NH, USA

Synonyms

Alienation from self; Character neurosis; Central inner conflict; Character pathology; Neurotic development; Neurotic disturbances; Neurotic drives; Neurotic pseudo-solutions; Overdetermined character solutions

Definition

Karen Horney (1937) defined neurosis as a "psychic disturbance brought about by fears and defenses against these fears, and by attempts to find compromise solutions for conflicting tendencies" (p. 26).Neurotic conflicts stem from childhood experiences where parental figures did not provide a loving, safe, and consistent environment. As a result, the child internalizes core feelings and beliefs of unworthiness, shame, and defectiveness. In an attempt to distance from these feelings, the individual develops compromise solutions to create a homeostatic self-regulating system to keep painful feelings at bay.

Introduction

Karen Horney (1885–1952) was one of the most original psychoanalytic thinkers to emerge from the Berlin Psychoanalytic Institute, a renowned center of psychoanalytic learning since the early part of the twentieth century. Her originality became clear early on as she began her cultural critique of Sigmund Freud's classical instinct theory focused on libido theory, psychosexual stages of development, and oedipal rivalries as the basis of adult psychopathology.

Following Horney's move to the United States in 1932, her convictions grew that the descriptions of classical theory were not only gender biased but philosophically rooted in outmoded nineteenth century ideas of objective distance, scientific detachment, and linear causation. In 1939 she published *New Ways in Psychoanalysis*, in 1945 *Our Inner Conflicts: A Constructive Theory of Neurosis*, and in 1950 *Neurosis and Human Growth: The Struggle Toward Self-Realization*. Through these books Horney created a new basis for understanding and treating neurosis and neurotic conflict: that the characterological present could *not* be ignored and that in terms of treatment progress the colliding forces of character dynamics were the ground zero of neurotic conflict. Although Reich (1949), Ferenczi (1952, 1955), and Ferenczi and Rank (1925) all challenged Freud on his unwarranted assumptions, only Horney actually offered a comprehensive new theory of neurosis and its treatment.

Clinical Details of Horney's Strategic Paradigm Shift in Psychoanalysis

Let us describe the clinical details of Horney's strategic paradigm shift in psychoanalysis. She developed a dynamic integration of intrapsychic, interpersonal/relational, and systemic aspects of the self. Rather than rooted in instinctual forces, conflict was seen as a product of compulsive trends in character structure operating in the *moment-to-moment* present. It compels the analyst to attend to the raw subjectivity of the patient: the tumult, terror, and humiliation that can potentially exist in all of us.

Conceptual changes began to develop that are much more attuned to *process* rather than to *content*. Danielian and Gianotti (2012) describe this as a metapsychological shift that "casts a long shadow: shame becomes more relevant than guilt, dissociation more relevant than repression, and the characterological present more relevant than the instinctual past" (p. 4). Addressing the moment-to-moment balance of forces in a patient brings us much closer to appreciating the ever-present conflict between the obstructive and constructive forces within the personality, what Horney called the psychic conflict between the real self, the self-hating self, and the idealizing self (Horney 1950).

It is relevant to point out that with the introduction of the psychic forces at work, Horney began to enlarge the concept of neurotic conflict itself. In her earlier works, when Horney (1939, 1945) described neurotic conflict, she meant characterological conflict occurring between compulsive trends each of which being fueled by self-hate and self-idealizations. But in *Neurosis and Human Growth*, Horney (1950) expanded the definition to include "central inner conflict" (p. 112 and p. 368). To be sure the central inner conflict is not very apparent in the early stages of analysis but gradually comes more into view as the patient begins to develop authenticity and self-realization. Its power is derived from "the fact that at the very core of our being, our real self with its capacity for growth, is fighting for its life" (p. 113).

The fight between the constructive forces that are in battle with the obstructive forces within the personality is present in all stages of therapy. However, as treatment progresses and the constructive forces get stronger, the patient is at a crossroads, where "pseudo-solutions" must be modified or relinquished in order for further integration of the real self to occur. This presents both an unconscious and conscious dilemma because at the heart of the neurotic construction is an attempt to create a sense of safety, equilibrium, and/or connection.

From a relational perspective, the creation of the pseudo-solution is a child's early adaptive attempt to preserve the tenuous connection to parental figures, figures who were often inconsistent, disorganized, or unavailable to meet the child's basic needs. Directly or indirectly, parental demands that the child remain "loyal" to the status quo meant not challenging parental authority. This dilemma often meant the relinquishment of the real self in order to preserve the precarious attachment or going against the status quo and suffering the experience of isolation, annihilation, or abandonment. From a relational perspective, this *no-win* false solution is at the heart of the central inner conflict.

Conclusion

In sum, Horney describes the central inner conflict as "the most comprehensive conflict of all – that between his pride system and his real self, between his drive to perfect his idealized self and his desire to develop his given potentials as a human being" (p. 356). Horney states that this is often the most turbulent period of analysis, requiring the patient to examine core questions of this conflict, such as, "does the patient want to keep whatever is left of the grandeur and glamor of his illusions, his claims, and his false pride or can he accept himself as a human being with all the general limitations this implies, and with his special difficulties but also with the possibility of his growth" (p. 356–7). Inevitably, resolving the central inner conflict requires a progressive grieving and a letting go of the grandiose wish for invincibility and the grandiose need to be perfect, allowing the individual to accept the innate humanness and goodness of who he is.

Cross-References

- ▶ Basic Anxiety (Horney)
- ▶ Glory (Horney)
- ▶ Moving Against People
- ▶ Moving Away from People
- ▶ Moving Toward People
- ▶ Neurosis
- ▶ Neurotic Pride (Idealized Image) and Neurotic Self-Hate
- ▶ Self-Realization (Horney)

References

Danielian, J., & Gianotti, P. (2012). *Listening with purpose: Entry points into shame and narcissistic vulnerability*. New York: Jason Aronson.

Ferenczi, S. (1952). *First contributions to psycho-analysis*. London: Hogarth Press.

Ferenczi, S. (1955). *Final contributions to the problems and methods of psycho-analysis*. London: Hogarth Press.

Ferenczi, S., & Rank, O. (1925). *The development of psychoanalysis*. New York: Nervous and Mental Disease Publishing.

Horney, K. (1939). *New ways in psychoanalysis*. New York: Norton.

Horney, K. (1945). *Our inner conflicts: A constructive theory of neurosis*. New York: Putnam.

Horney, K. (1950). *Neurosis and human growth: The struggle toward self-realization*. New York: Norton.

Reich, W. (1949). *Character analysis*. New York: Noonday Press.

Neurotic Anxiety

Francisco Pizarro Obaid
Facultad de Psicología, Universidad Diego Portales, Santiago, Chile

Introduction

This is a term invented by Sigmund Freud in order to conceptualize the anxiety located within neurosis, whose manifestations take the form of *expectant anxiety* or *anxious expectation* (a feeling of danger and catastrophic thinking), *anxiety attack* (suffocation, heart palpitations, tachycardia, sweating, vertigo) or *phobias* (agoraphobia; zoophobia). Unlike *realistic anxiety*, which can be considered a rational and understandable reaction to the perception of external danger, *neurotic anxiety* is the result of instinctual drives and unconscious desire, in the sense that as its etiology, for Freud, refers to frustrated sexual practices (actual neuroses) or to an unconscious psychic conflict that affects the ego (psychoneuroses).

From his earliest investigations on nervous disorders, anxiety was considered by Freud (1907) to be the "central and most delicate problem of the theory of neurosis" (p. 200), later classifying it as a *nodal point* or an *enigma*, in which all of the most relevant questions about psychoanalysis converged (Freud 1916–17). Parallel to his studies on hysteria, Freud (1895a, b) also profoundly examined the problem of anxiety, exploring, first, phobias and, then, analyzing *neurasthenia* (Beard 1880). As the result of these investigations, he proposed the category of *anxiety neurosis* (Freud 1895a, b), his first independent contribution to the psychopathology of his time.

When coming up with the category of *anxiety neurosis* (a syndrome whose central symptoms are expectant anxiety, panic attacks, vertigo, heart palpitations and breathing difficulties, intense bouts of sweating and shaking), Freud (1895a) focused on neurotic anxiety and looked to refute the etiological hypothesis of US physician George Beard (1880), who supposed that the causes of the lack of nerve force and exhaustion breakdown – pathognomonic signs of *neurasthenia* – resided in the negative effects of *modern civilization* and environmental pressures on the nervous system. Freud (1892), however, proposed a provocative general thesis in order to comprehend nervous ailments: "No neurasthenia or analogous neurosis exists without a disturbance of the sexual function" (p. 38).

While the anxiety that is part of *anxiety neurosis* has an etiology of sexual origin, it lacked, according to Freud (1895b), "its own psychic mechanism" (p. 82); its genesis had to do with incomplete or frustrated sexual practices, such as *coitus interruptus*, *onanism*, or *abstinence*, which produced an elevation in the amount of energy that the psychic apparatus had to process. From there, anxiety could be understood as a type of somatic residue from that which was massively discharged, as the psychic apparatus was not able to bind and psychically elaborate the excess of tension (Freud 1895a).

As a counterpoint to the etiological model of *anxiety neurosis*, anxious manifestations of *psychoneuroses* (hysteria, phobias, obsessions) found their meaning in interventions related to memory, fantasy, trauma, and desire, a hypothesis that would be reaffirmed by the invention of the category of *anxiety hysteria* (Freud 1909), a term which was proposed in order to conceptualize phobias from the psychoanalytic point of view. In other words, as much in *psychoneuroses*, as in *anxiety hysteria* (phobia), anxiety was determined by an unconscious conflict and the use of the ego's defense mechanisms, employed in order to counter an irreconcilable representation.

Advances in the conceptualization of psychosexual development (Freud 1905), studies on phobia (Freud 1909) and the metapsychological study of major concepts in psychoanalytic theory (unconscious, instinct, repression), led Freud (1915a) to deepen his hypothesis on the possible relation between anxiety, instinct, the unconscious, and repression, distancing himself from the study of *actual neuroses* (*neurasthenia*, *hypochondria*, *anxiety neurosis*). From this perspective, he concentrated his investigations in the area of psychoneuroses and sustained that anxiety in these cases could be explained, specifically, through the repression mechanism {*Verdrängung*}. He proposed that the ego's repressive action on the threat of instinctual impulse produced a disassociation between representation {*Vorstellung*} that represents {*rapresentieren*} the drive and its cathexis (quantum of energy). On the one hand, the representation that carries an irreconcilable unconscious desire for the ego is repressed and enters into an associative chain that moves it away from consciousness. On the other hand, the amount of affect {*Affektbetrag*} derived from the repressive process (quantum of energy) is discharged and takes the form of anxiety. In this sense, anxious affect can be considered as one of the possible destinations of instinct (Freud 1915b). In a note added to *Three Essays on Sexual Theory*, Freud (1905 [1920]) summarized his new thesis on anxiety and highlighted its importance: "One of the most important results of psycho-analytic research is this discovery that neurotic anxiety arises out of libido, that it is the product of a transformation of it, and that it is thus related to it in the same kind of way as vinegar is to wine" (Freud 1905[1920], p. 224).

After assuming that anxiety could be considered an effect of the repressive process, Freud (1916–17, 1932) continued his analysis within the framework of his *Lectures on Psychoanalysis*. Although he did not examine in detail the differences between the most common expressions of anxiety, such as anguish{*Angst*}, fear {*Furcht*}, and terror {*Schreck*}, he did propose, in concordance with the psychopathology of his time that, "*Angst* relates to the state and disregards the object, while *Furcht* draws attention precisely to the object. It seems that '*Schreck*', on the other hand, does have a special sense, it lays emphasis, that is, on the effect produced by a danger which is not met by any preparedness for anxiety. We

might say, therefore, that a person protects himself from fright by anxiety" (Freud 1916–17, p. 360).

Freud (1895a) had employed the expression *neurotic anxiety* in his first studies on *anxiety neurosis*, but in 1917 he proposed to distinguish between *realistic anxiety* and *neurotic anxiety*. The first, he held, "(. . .) strikes us as something very rational and intelligible. We may say of it that it is a reaction to the perception of an external danger – that is, of an injury which is expected and foreseen. It is connected with the flight reflex and it may be regarded as a manifestation of the self-preservative instinct" (p. 358). That is, a "state of increased sensory attention and motor tension which we describe as 'preparedness for anxiety'" (Freud 1932, p. 82). As for the second, which could appear as expectant anxiety, anxious expectation, phobia, or anxiety attack, "(. . .) the ego is making a similar attempt at flight from the demand by its libido, that it is treating this internal danger as though it were an external one (. . .). Just as the attempt at flight from an external danger is replaced by standing firm and the adoption of expedient measures of defense, so too the generation of neurotic anxiety gives place to the formation of symptoms, which results in the anxiety being bound" (Freud 1916–17, p. 369).

Toward the mid-1920s, and motivated by the controversial hypotheses of Otto Rank (1924), which proposed that the trauma of birth is the definitive cause of anxiety and neurosis, Freud (1926) sought to profoundly revise his hypotheses on anxiety (Pizarro Obaid 2012). After rejecting the hypothesis of trauma at birth, Freud (1926) strongly defended the concepts that had shaped his theorization of neurosis and anxiety: repression, drive, Oedipus complex, and castration. However, when trying to perfect his understanding of the problem, he inverted the causal relationships between anxiety and repression, now supposing that it was anxiety that set off the repressive process. From this perspective, it was possible to sustain that anxiety acted as a signal that anticipated a possible danger for the ego and, therefore, that the ego led to a defensive action (repression) that sought to alleviate displeasure. Following this idea, he proposed the concepts of *signal anxiety* and *automatic anxiety* and considered *castration anxiety* as the prototypical manifestation of danger and the most important cause of anxiety and neurosis. The signal function would imply "[. . .] a transition from the automatic and involuntary fresh appearance of anxiety to the intentional reproduction of anxiety as a signal of danger [. . .] In these two aspects, as an automatic phenomenon and as a rescuing signal, anxiety is seen to be a product of the infant's mental helplessness which is a natural counterpart of its biological helplessness" (Freud 1926, p. 138).

In the early 1930s, the old opposition between *realistic anxiety* and *neurotic anxiety* was taken up again in light of new positions that Freud had assumed in his dispute with rank and the principles of his second psychic apparatus model (ego, id, superego). After proposing the ego as the *seedbed of anxiety* (Freud 1923) and attributing to anxiety the function of being a sign of danger, Freud (1932) sustained that, "if we take in succession neurotic anxiety, realistic anxiety and the situation of danger, we arrive at this simple proposition: what is feared, what is the object of the anxiety, is invariably the emergence of a traumatic moment, which cannot be dealt with by normal rules of the pleasure principle (. . .) we shall no longer maintain that is the libido itself that is turned into anxiety in such cases. But I can see no objection to there being a twofold origin of the anxiety – one as a direct consequence of the traumatic moment and the other as a signal threatening a repetition of such a moment" (Freud 1932, p. 87).

Conclusion

Without a doubt, anxiety was a central concept in Freudian psychoanalytic theory. Moving beyond its indubitable neurovegetative components and evident corporal manifestations, the distinctive and original hallmark of the different Freudian conceptualizations of anxiety (*anxiety neurosis*, *neurotic anxiety*/*realistic anxiety*, *signal anxiety*/*automatic anxiety*, *castration anxiety*) was to propose that, while anxiety is, by definition, something experienced by the ego and consciousness, from the point of view of its fundamental base, it

could be considered an unconscious affect that has, as its principal function, that of being a defense when confronted with instinctual dangers and unconscious desires.

Cross-References

► Neurotic Anxiety

References

Beard, G. M. (1880). *A practical treatise on nervous exhaustion (neurasthenia), its symptoms, nature, sequences, treatment*. New York: William Wood & co..

Freud, S. (1892). *"Draft A". The complete letters of Sigmund Freud to Wilhelm Fliess (1887–1904)*. Cambridge, MA: Harvard University Press.

Freud, S. (1895a [1894]). On the grounds for detaching a particular syndrome from neurasthenia under the description 'anxiety neurosis'. In *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 3, pp. 85–117). London: Hogarth Press, 1957.

Freud, S. (1895b). A reply to criticisms of my paper on anxiety neurosis. *The Standard edition of the complete psychological works of Sigmund Freud* (Vol. 3, pp. 119–139). London: Hogarth Press, 1957.

Freud, S. (1905). Three essays on the theory of sexuality. In *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 7, pp. 125–245). London: Hogarth Press, 1957.

Freud, S. (1907). Séance du 24 avril de 1907. Discussion. In E. Federn & H. Nunberg (Eds.), *Les premiers psychanalystes. Minutes de la Société Psychanalytique de Vienne. Vol. I (1906–1908)* (pp. 197–202). Paris: Gallimard. 1976.

Freud, S. (1909). Analysis of a phobia in a five-year-old boy. In *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 10, pp. 1–150). London: Hogarth Press, 1957.

Freud, S. (1915a). Repression. In *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 14, pp. 146–158). London: Hogarth Press, 1957.

Freud, S. (1915b). Instincts and their vicissitudes. In *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 14, pp. 109–140). London: Hogarth Press, 1957.

Freud, S. (1916–17). XXV: Anxiety. Introductory lLectures on pPsycho-aAnalysis. In *The standard edition of the complete psychological works of Sigmund Freud* (pp. 392–411). London: Hogarth Press, 1957

Freud, S. (1923). The Ego and the Id. In *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 19, pp. 1–66). London: The Hogarth Press, 1957.

Freud, S. (1926). Inhibitions, symptoms and anxiety. In *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 20, pp. 77–174). London: Hogarth Press, 1957.

Freud, S. (1932). XXXII: Anxiety and instinctual life. New Introductory Lectures on Psycho-Analysis. In *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 22, pp. 81–111). London: Hogarth Press, 1957.

Pizarro Obaid, F. (2012). Sigmund Freud and Otto Rank: Debates and confrontations about anxiety and birth. *The International Journal of Psycho-Analysis, 93*(3), 693–715.

Rank, O. (1924). *The trauma of birth*. New York: Robert Brunner.

Neurotic Development

► Neurosis and Neurotic Conflict

Neurotic Disturbances

► Neurosis and Neurotic Conflict

Neurotic Drives

► Neurosis and Neurotic Conflict

Neurotic Personality (Horney)

Linda S. Penn and Zachary Neumann
Department of Psychology, Long Island University, Brooklyn, NY, USA

Introduction

Karen Horney's theory of neurotic personality structure provides a rich conceptual framework for understanding psychopathology and human development. Horney's theories have had a lasting impact on the psychoanalytic landscape and can be recognized in contemporary thought, often without

sufficient credit given to the importance of her contributions. Rather than writing about specific behavioral symptoms, Horney described neurotic personality in terms of underlying character disturbances resulting from social and cultural circumstances. She argued that all neurotic patients, while possessing unique neurotic personalities, shared the same fundamental disruptions in their personality structure. Different personality "types" or "styles" were thus understood as permutations of a basic underlying conflict rather than as conceptually distinct conditions (Horney 1945). This understanding of neurosis, a radical departure from the prevailing theories of the day, provided a new lens through which to understand the human experience and can be viewed as an early example of what is now called relational theory.

Horney's Theory of Neurotic Personality

In a time when few theorists dared to deviate from the doctrine of classical psychoanalysis, Horney reformulated almost all of the major tenets of Freudian theory. Horney de-emphasized libidinal drives and infantile sexuality; instead she placed the formation of self, human relationships, and cultural processes at the center of her theory. In her theory of neurotic personality, Horney described character pathology in terms of the whole personality and enduring patterns of being in the world rather than in terms of specific symptoms. Although her ideas evolved considerably over time, she remained committed to elucidating major character styles as defensive approaches to managing anxiety. Horney posited that all neurotic patients shared the same fundamental disturbance in their character formation (Horney 1937, p. 33). For Horney, the underlying disturbance, rather than being rooted in sexual and aggressive biological impulses, was rooted in relational conflict and disruptions in the process of *self-realization*.

Horney emphasized early developmental processes in the formation of character neurosis. She writes that when caregivers are too consumed by their own neurotic needs, they are unable to provide a safe, warm, and constructive environment for the developing infant. As a result, the child experiences a state of profound anxiety, unease, and apprehensiveness. Horney refers to this frightening state as *basic anxiety*, which she describes as a feeling of isolation and helplessness in a potentially hostile world. The child desperately searches for a way to lessen this anxiety and achieve a state of felt security in a world that is frightening and unpredictable. Horney posited that the individual will tend to adopt one of three defensive relational orientations that determine her neurotic personality type; she will move *toward*, *against*, or *away* from others (Horney 1945).

When moving *toward* people, the individual accepts her own helplessness. This individual becomes overly dependent, compliant, and unable to assert her own wishes and desires. When moving *against* people, the person accepts the hostility in her environment and decides to fight, to rebel; she is mistrustful of others and sets out to defeat them. When moving *away* from people, the individual becomes increasingly distant in an effort to feel independent and self-sufficient. However, she instead become progressively more isolated, withdrawn, and inhibited. Horney originally referred to these three styles as compliant (moving toward), aggressive (moving against), and detached (moving *away*). In later writing she used the terms self-effacing (toward), expansive (against), and resigned (away) in her efforts to emphasize intrapsychic as well as the interpersonal experience (Horney 1950). In some ways, Horney's distinctions of neurotic types are similar to what are now termed dependent personality, narcissistic personality, and schizoid personality.

For healthy individuals, the three moves – toward, against, and away – are not in conflict and can operate simultaneously. The healthy individual is capable of depending on others, of asserting their needs, and of keeping to themselves when appropriate. However, when the individual is consumed by *basic anxiety*, they adopt a stance of neurotic rigidity in their interactions with others. Rather than being experienced as synergistic and complimentary, the three moves are experienced as antithetical to one another, leading to an intense state of conflict and anxiety. The person attempts to navigate this conflict by

consistently and rigidly emphasizing one of the moves in their relations with others. People who rigidly move *against* others, for instance, form a neurotic personality in which they become aggressive and confrontational, while having difficulty asking for help, expressing their love, or separating from others when necessary. The individual's degree of rigidity directly corresponds to the severity of their neurosis (Horney 1945).

Because of their intense basic anxiety, neurotic individuals develop an encrusted personality structure and are entrenched in rigid patterns of relatedness. This rigidity inevitably undermines their ability to maintain healthy relationships with others and integrate new experiences. Horney (1945) refers to this as the *basic conflict*, a conflict which underlies the observable expressions of character neurosis and often gives rise to a vicious and self-defeating relational cycle. Consumed by feelings of helplessness, an individual may rigidly move toward others in order to achieve felt security. The person then becomes intensely dependent on others, often to a degree that begins to push the other away, which inevitably reinforces the initial feelings of helplessness. This type of rigid approach thus intensifies the threat that it was initially intended to manage. Neurotic individuals who rigidly move toward, against, or away from others may differ in their habitual behaviors, fears, and defensive constellations. However, their neurotic character structures are understood as permutations of the same underlying conflict. Horney's basic conflict is fundamentally a relational conflict, one which results from rigid and contradictory attitudes toward others (Horney 1945).

While her earlier writings focused on the interpersonal aspects of the neurotic personality through the lens of the *basic conflict*, Horney's later work also integrated a more intrapsychic perspective. At the center of Horney's theory of intrapsychic development was the process of self-realization and the potential conflict between the *real self* and the *idealized self*. Horney argued that, under favorable conditions, human beings strive toward self-realization. We all strive to become our authentic selves, actualize our intrinsic potentialities, and attain a sense of coherence and meaning. She writes that an individual will naturally and spontaneously attempt to develop their own resources, unique capacities, and ability to relate to others in an authentic and spontaneous manner. Through this constructive process of growth, one moves toward self-realization and lives in accordance with their real self. However if a child meets an unfavorable environment, one in which their caregivers are harsh, intrusive, inattentive, or indifferent, the person's natural striving toward self-realization may be thwarted, and she may not be able to develop in accordance with her individual needs and potentialities. The individual may also become aware of a threatening sense of hypocrisy in her environment as she notes the frightening contradictions in her caretakers' behavior (Horney 1950).

When these adverse environmental conditions lead to basic anxiety, i.e., the profound feeling of helplessness in a potentially hostile world, this anxiety not only contributes to a rigid pattern of relatedness though the basic conflict but also impedes the process of self-realization. The neurotic individual, consumed by anxiety, struggles with feelings of inferiority, helplessness, and deficits in self-esteem. As a result, she develops a need to elevate herself in order to foster a sense of identity, confidence, and internal coherence. She creates an idealized self-image, where she imagines her ideal self as powerful and superior. The *idealized self* is absolute and unattainable, but can serve to bolster self-esteem and provide a fleeting sense of security. In *Neurosis and Human Growth* (1954), Horney writes that self-idealization "gives the individual the much-needed feeling of significance and of superiority over others" (p. 22). The neurotic individual works tirelessly to live up to their idealized self-image. Instead of striving toward self-realization, the neurotic personality embarks on a quest for glory, seeking perfection, adulation, and sometimes vindictive triumph over others. However, in their futile attempt to actualize their idealized self, the neurotic patient becomes increasingly cutoff from their *real self* and their authentic feelings and wishes. They thus fail to achieve a sense of internal coherence and fulfillment.

Horney notes that neurotic individuals pay a heavy price for their persistent efforts to live up to

their idealized self. The nature of the idealized self is such that it can never truly be achieved – the person will inevitably fall short in some way. As a result of this inevitable failure, they come to be dominated by harsh inner dictates, internal reminders of everything they *should* be. A particular person might feel, for instance, that she should always exhibit the highest degree of generosity, intelligence, resilience, and discipline. In other cases the inner dictates may take on a negative quality, with the individual believing that she must exhibit the highest degree of aggression, defiance, or psychopathy. In either case, the inner dictates are absolute, unrelenting and, by their very essence, always unattainable.

Horney (1950) describes the effect of these inner dictates as "*The Tyranny of the Shoulds*." The "shoulds" reflect the individual's intense striving toward self-idealization and are experienced as harsh and unending self demands to be perfect. Horney notes that individuals may respond to the "shoulds" in different ways; they may tirelessly attempt to actualize them, torment and hate themselves for their inevitable failure to actualize them, or openly rebel against them. More often, individuals experience conflict and may oscillate or exhibit signs of each orientation. Regardless of which stance one adopts, the "shoulds" exert a coercive and insidious influence on one's life and personality development. Further, when the individual experiences contradictory "shoulds," she is prone to intense anxiety, inhibition, and psychic conflict. The tyranny of the shoulds and the quest for self-idealization impair spontaneity, inhibit social development, and lead the individual to become further alienated from their real self and constructive striving toward self-realization (Horney 1950, p. 21).

Along with interpersonalist theorists such as Sullivan and Fromm, Horney played an important role in the emergence of culturalism in the 1930s. Horney argued that the neurotic individual could not be understood independently of her cultural context. Cultural norms and values are transmitted to the developing child through the caretaker environment and continually shape the child's developmental trajectory. Instead of focusing only on a one-person psychology, Horney located the individual within a cultural matrix and emphasized the complex impact of cultural norms, gender roles, and social pressures on development.

Conclusion

Perhaps owing to the fact that Horney established her own psychoanalytic school in 1941, she is rarely cited by contemporary psychoanalytic theorists. However, her theory of neurotic personality has clearly influenced current thinking about character structure and psychopathology. Horney's language is jargon-free, and her descriptions of internal conflicts and character types are vivid and penetrating. Her concepts are "experience near" and are accessible to readers with varying degrees of familiarity with the psychoanalytic literature (Rubin and Steinfeld 1991). Horney's theories provide a framework for understanding a wide range of clinical conditions across a broad continuum of health and pathology. While many theorists have emphasized either the intrapsychic or the interpersonal, Horney has managed to integrate the two. The conflict between the real and idealized self reflects the complex intrapsychic striving for internal coherence and meaning, while the basic conflict is fundamentally a conflict in human relationships. Horney located the individual within a complex interpersonal matrix, consisting of concentric circles of self, other, and cultural trends more broadly. She put forth a comprehensive and compelling theory of how one's relational and cultural environment shapes both the development of a neurotic personality and the expression of it.

References

Horney, K. (1937). *The neurotic personality of our time*. New York: Norton & Company.

Horney, K. (1945). *Our inner conflicts: A constructive theory of neurosis*. New York: Norton & Company.

Horney, K. (1950). *Neurosis and human growth: The struggle towards self-realization*. New York: Norton & Company.

Rubin, J., & Steinfeld, S. (1991). *Neurosis and human growth: The struggle towards self-realization. Foreword to the* (1st ed.). New York: Norton & Company.

Neurotic Pride (Idealized Image) and Neurotic Self-hate

Jack Danielian[1] and Patricia Gianotti[2]
[1]The American Institute for Psychoanalysis, Karen Horney Center, New York, NY, USA
[2]Woodland Professional Associates, North Hampton, NH, USA

Synonyms

Egocentricity; False pride; False self-esteem; Self-alienation; Unconscious self-glorification

Definition

Neurotic pride is a defense posture that arises due to an underlying sense of insecurity and feeling of unworthiness. Horney believed that neurotic development generally arose from an unfavorable or inadequate home environment that in turn weakened the child at the core of his being. As a result, Horney (1950) states, "He becomes alienated from himself and divided. His self-idealization is an attempt to remedy the damage done by lifting himself in his mind above the crude reality of himself and others" (p. 87). Neurotic pride is a compulsively driven attempt to overcompensate for and dissociate oneself from deep-seated feelings of inadequacy that interfere with the unfolding emergence of the real self.

Introduction

Neurotic pride and the idealized image are fundamental components of Karen Horney's theory of neurosis. All of Horney's character dynamics, "moving toward," "moving against," and "moving away" are character solutions compulsively created out of pride, idealization, and, the very mirror image of these aspirations, self-hate. This understanding of neurosis as a character disturbance developing out of varying levels of trauma, from disrupted, insecure, or unreliable ties with early caregivers to later grave psychic insults in life, moves the focus of psychoanalysis from instinct fixations to self-individuation.

Description/Definition

Horney's concept of neurotic pride and the idealized image is best understood within the context of examining the contrast between healthy pride and neurotic pride. Horney (1950) states that healthy pride is based on *substantial attributes*, such as "having autonomous convictions and acting upon them, having the self-reliance that stems from tapping our own resources, assuming responsibility for ourselves, taking a realistic appraisal of our assets, liabilities and limitations, having strengths and directness of feelings, and having the capacity for establishing and cultivating good human relations" (p. 88).

Neurotic pride is based on *unsubstantial attributes* that support the "glorified" or idealized self. The constructed, idealized image of the self is what actually creates and fuels the pride system. Attributes of neurotic pride are often *extraneous assets*, such as prestige, status, or superficial measures such as appearance. Horney described the drive to achieve these prestige values as becoming so critical to individuals "that their lives revolve around them and often they would "fritter away their best energies in their service" (p. 89). Because neurotic pride is based on insubstantial or external measures, it is also marked by an extreme sensitivity to hurt, disappointment, or rejection. At just these critical moments, the pride system becomes most vulnerable and therefore most amenable to insight.

The Pride System

How do pride, idealization, and self-hate become an unconscious construction that can grow on itself? They are all systemic parts of what Horney called "the pride system," a system of feelings, thoughts, beliefs, and behavior that create inner vulnerability and thereby sap a person's healthy strivings toward growth and self-development.

Since the pride system is substantially unconscious, the individual does not know that he is idealizing himself. It thereby becomes possible to see oneself in flattering terms involving perfectionistic aspirations that can embrace (among other things) idealized beauty, power, saintliness, or honesty. She describes a condition where a person "may have a vague sense that he is making high demands upon himself, but mistaking such perfectionist demands for genuine ideals he in no way questions their validity and is indeed rather proud of them" (Horney 1945, p. 97).

Through such all-or-nothing thinking, the individual is caught between adoration and contempt with no middle ground possible. Either he has unlimited rights or no rights at all. In fact, Horney depicts the pride system as involved in a life-challenging battle with the resources of the real self until the false assumptions of the former can be identified and undermined.

Development of the Idealized Image

How does the idealized image get created? It develops in the microcosm of intimate relationships with caregivers who cannot attune themselves to the needs of the child. The lack of attunement is typically a product of the caregiver's own idealizations which in turn developed as a result of that adult's own early relational deprivations. When the caregivers' early deprivations have metastasized into compulsive narcissistic needs in adulthood, an intergenerational transmission of emotional dysfunction has been created. Thus self and other idealizations get handed off often without consciousness and without conscious intent. And without fail, an idealized image will generate insecurity and self-loathing, which Horney called "basic anxiety – a feeling of being isolated and helpless in a world conceived as potentially hostile" (Horney 1950, p. 18).

Once overidealization takes unconscious hold, the sources of danger deepen and widen. Now we are not only fearful about what we cannot do but what we can do. Without awareness, our idealizations take us into a world designed for self-protection but destined for unrelenting conflict. Russell (2015) describes it well. "Our deepest fear is not that we are inadequate. Our deepest fear is that we are powerful beyond measure. It is our light, not our darkness that most frightens us" (p. 3). The very light that could deepen our self-awareness and our potential for healing now becomes coopted by magical ideas of an ultimate perfection. Note here one of Horney's deepest insights: *that the sources of our real self can become usurped and hijacked in the imagined pursuit of "protective" perfection.*

Conclusion

Because neurotic pride and the overidealized self-image are compensations meant to keep feelings of shame and unworthiness at bay, the construction of the pride system is ultimately not a sustainable solution. Over time, depression, weariness, and hopelessness eventually emerge from under the surface. Whether triggered by loss or environmental trauma or the result of aging or disappointment, underlying symptoms such as depression, anxiety, and even bitterness or rage will eventually begin to emerge. However, the therapeutic process is one in which we invite our patients to become curious about goals and ambitions and allowing them the freedom to explore these dynamics in an atmosphere of tolerance and support. Over time they gain a precious understanding that no matter how enigmatic these aberrant mechanisms are, the growing forces of the real self will reabsorb them and redeem the person's sense of authentic wholeness. Knowing this, the posture of the therapist becomes optimistic and life affirming and can remain so.

Cross-References

- ▶ Basic Anxiety (Horney)
- ▶ Glory (Horney)
- ▶ Moving Against People
- ▶ Moving Away from People
- ▶ Moving Toward People
- ▶ Neurosis
- ▶ Self-Realization (Horney)

References

Horney, K. (1939). *New ways in psychoanalysis*. New York: Norton.
Horney, K. (1945). *Our Inner Conflicts*. New York: Norton.
Horney, K. (1950). *Neurosis and human growth: The struggle toward self-realization*. New York: Norton.
Russell, E. (2015). *Restoring resilience: Discovering your clients: Capacity for healing*. New York: Norton.

Neurotic Pseudo-solutions

► Neurosis and Neurotic Conflict

Neuroticism

Clair Cassiello-Robbins, Julianne G. Wilner and Shannon Sauer-Zavala
Center for Anxiety and Related Disorders, Department of Psychological and Brain Sciences, Boston University, Boston, MA, USA

Synonyms

Behavioral inhibition; Negative affectivity; Negative emotionality

Definition

The tendency to experience frequent and intense negative emotions accompanied by a perceived inability to cope with such experiences.

Introduction

Temperament has been broadly described as an individual's enduring emotional nature (Shiner et al. 2012). Neuroticism, one dimension of temperament, is defined as the tendency to experience intense negative emotions accompanied by aversive reactions to these experiences when they occur (such as a sense of uncontrollability or perceived inability to cope; Sauer-Zavala and Barlow 2014). Compared to other temperamental traits, neuroticism has received the most empirical attention, likely due to its association with a variety of psychological and physical health concerns. Previously thought to be a stable part of one's character, there is increasing evidence to suggest that neuroticism is more malleable than previously thought, underscoring exciting developments in the treatment of common mental health conditions.

Historical Context

The term *neuroticism* was first coined by Eysenck (1947) to describe the temperamental tendency to experience frequent and intense negative emotions in response to various sources of stress. This trait has primarily referred to anxious or depressed moods, but also includes other negative emotions such as fear, irritability, and anger. Additionally, individuals high in neuroticism often demonstrate aversive reactions to their emotional experiences, which typically include efforts to suppress or control these feelings (e.g., avoiding public speaking because one finds public speaking anxiety provoking and experiences this anxiety as aversive; Barlow et al. 2014b).

The origin of the word neuroticism lies in the psychoanalytic term, *neurosis*, used to describe psychopathology without delusions or hallucinations. Specifically, Freud (1924) differentiated between objective anxiety signaling, an immediate threat, and neurotic anxiety, a continual state of distress stemming from the unsuccessful use of defense mechanisms (i.e., repression of early traumatic experiences). Later, the early founders of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM), the classification system for psychological disorders used in the United States, adopted this term to refer to what we now consider to be anxiety, depression, and related disorders. Using "neuroticism" to describe classes of psychopathology has largely fallen into disuse with the field focusing more on discrete diagnostic labels (e.g., generalized anxiety disorder, panic disorder). Instead, the term is

now used interchangeably with other constructs that highlight the experience of negative emotions, including negative affect/affectivity, negative emotionality, and negative affect instability (Miller and Pilkonis 2006). Today, neuroticism is considered an important dimension of personality and is represented in most models of personality, including the well-known three-factor and five-factor models.

The Development of Neuroticism

There is empirical evidence to suggest that temperament arises from interactions between genetic, biological, and environmental factors over time (Shiner et al. 2012). Barlow et al. (2014a) formulated a model to describe the development of neuroticism that takes these factors into account. Broadly, this model posits that neuroticism results from a generalized biological vulnerability and a generalized psychological vulnerability.

The generalized biological vulnerability refers to genetically inherited risk, as well as the specific neurobiological functioning associated with neuroticism. There are high heritability estimates for this trait (40–60%), suggesting that the tendency to experience negative emotions is passed down in families (e.g., Bouchard and Loehlin 2001). This heritability translates to greater amygdala excitability coupled with reduced inhibitory control by prefrontal structures (Westlye et al. 2011). The amygdala is considered an emotion-generating area of the brain, whereas the prefrontal structures provide impulse and emotion-regulatory control. Thus, the aforementioned combination can result in an individual generating negative emotions frequently and/or intensely while encountering difficulty exerting executive control over their regulation.

This generalized biological vulnerability interacts with a general psychological vulnerability to perceive the world as uncontrollable combined with the belief that one would be unable to cope with any negative outcomes that arise (Gunnar and Quevedo 2007). Basic animal and human research supports the contribution of perceived lack of control in the development of neuroticism. For example, animal and human subjects placed in uncontrollable environments (i.e., where food or punishment is distributed at irregular intervals) tend to show higher levels of negative emotions and anxious behaviors such as increased autonomic arousal or excessive motor activity (for review, see Barlow et al. 2014a). Similarly, individuals with higher external loci of control (i.e., people who believe that their life is controlled by external factors such as the environment or fate) are more likely to score higher on measures of neuroticism (e.g., Wiersma et al. 2011).

Early adversity and parenting styles have also been shown to influence children's perceptions of control, thereby affecting their propensity to experience negative emotions. For example, parents who consistently and warmly respond to their children provide a sense of predictability in the environment. On the other hand, negative parenting behaviors, notably abuse or neglect, are associated with higher levels of neuroticism potentially because they create an environment of unpredictability or even punishment. Other parenting styles such as overprotectiveness can also contribute to neuroticism by modeling to children that emotions are dangerous and the child requires protection from experiencing them. Importantly, these early learning experiences can lead to changes in brain functioning, creating a feedback loop in which the generalized biological vulnerabilities are sensitized. That is, early adversity can augment amygdala hyperexcitability and reduced prefrontal control (Barlow et al. 2014b).

Association of Neuroticism with Physical and Mental Illness

Given neuroticism's association with a wide range of physical and mental health concerns, the public health implications of this trait have begun to draw attention (for review, see Lahey 2009). In terms of physical health, patients high in neuroticism are more likely to report a variety of somatic complaints, including cardiovascular disease, asthma, and irritable bowel syndrome (Frølund

Pedersen et al. 2016). In one study, individuals higher in neuroticism showed greater reactivity to daily stressors, which was associated with increased risk of having a chronic physical health condition at a later point in time (Piazza et al. 2013). Further, in the context of chronic diseases and cancer, neuroticism is a strong predictor of clinical deterioration and mortality. Taken together, there is accumulating evidence to suggest that neuroticism is associated with the onset, maintenance, and deterioration of a wide range of physical health problems (for review, see Lahey 2009).

Additionally, neuroticism is associated with the presence of a number of mental disorders including mood, anxiety, somatoform, psychotic, eating, substance use, and personality disorders. Further, neuroticism has been shown to predict the onset of mental disorders with the most research support drawing temporal links between high levels of neuroticism and the subsequent development depressive and anxiety disorders (for review, see Lahey 2009; Zinbarg et al. 2016). Also of note, comorbidity or co-occurrence of these disorders is common; estimates suggest that up to 55% of patients with a mood or anxiety disorder meet criteria for an additional disorder at the same time. Research indicates that higher levels of neuroticism are related to greater comorbidity among these disorders (Brown and Barlow 2009; Zinbarg et al. 2016).

There is increasing evidence to suggest that the comorbidity among common mental health conditions might be accounted for by a common, core underlying process (Brown and Barlow 2009). A functional model of anxiety, depressive, and related disorders (emotional disorders; Barlow 1991) that implicates neuroticism as a key, transdiagnostic risk factor has been articulated (Barlow et al. 2014b). In this model, emotional disorders are characterized by the frequent and intense experience of negative emotions and aversive reactions to this experience (neuroticism) combined with efforts to escape or avoid these emotional experiences. Paradoxically, such efforts tend to reduce distress in the short-term but lead to rebound effects that increase the experience of negative emotions in the long term (Sauer-Zavala and Barlow 2014). The symptoms of anxiety, depressive, obsessive-compulsive, trauma-related, and bipolar disorders, as well as borderline personality disorder, have all been conceptualized within this framework (Sauer-Zavala and Barlow 2014). Given that neuroticism has been implicated as a transdiagnostic risk factor for a range of psychopathology, it raises the question of whether this trait, itself, could be a target of intervention.

Malleability of Neuroticism

Despite longstanding beliefs that personality traits are stable and inflexible across time (APA 2013), there is increasing evidence that neuroticism may be more malleable than previously thought. For example, longitudinal studies of the general population show gradual age-related decreases in neuroticism and related constructs that continue into old age (Eaton et al. 2011). Interestingly, data indicate that these changes are largely idiosyncratic, with great variability in the degree of change over time (Helson et al. 2002). Specifically, individuals with higher initial levels of neuroticism tend to show less change in this trait over time, and conversely, individuals with lower initial levels of neuroticism tend to evidence greater change (Brown 2007).

Studies evaluating movement on neuroticism among individuals with DSM disorders, over time or in response to treatment, have demonstrated mixed results. For example, Eaton et al. (2011) found that neuroticism remained relatively stable in a sample of individuals with depressive disorders. Additionally, neuroticism did not appear to change significantly following a course of treatment with dialectical behavior therapy for individuals with borderline personality disorder (Davenport et al. 2010). In contrast, Brown and Barlow (2009) found that, among individuals engaged in psychological treatment, DSM-IV disorder constructs (social anxiety disorder, generalized anxiety disorder, and depression) improved significantly over time while other temperamental variables (e.g., extraversion) remained stable;

neuroticism, however, evidenced the greatest amount of temporal change among such variables and was associated with the largest treatment effect.

Additionally, as high neuroticism is necessary for the development of a range of common mental disorders, one would expect that this trait would vary in accordance with the onset or remission of symptoms. In fact, a number of longitudinal studies have found that neuroticism independently predicts anxiety and mood, even when taking into account the periodic occurrence of anxious or depressive symptoms (Lahey 2009). Further, while neuroticism predicts the course of DSM anxiety, mood, and personality disorders, with higher levels of this trait reflecting less change in symptoms across time, the converse does not appear to occur; that is, initial levels of DSM disorders do not predict changes in temperament over time (Warner et al. 2004).

The aforementioned research raises questions about the mechanisms through which neuroticism changes and whether directly targeting this trait in treatment would lead to more definitive results, rather than addressing DSM disorder symptoms. Indeed, recent research in this area suggests that change in neuroticism is greater with interventions explicitly designed to target this trait. The psychopharmacology literature hosts the majority of studies directly aimed at addressing temperament. Specifically, serotonergic drug agents (i.e., selective serotonin reuptake inhibitors) hold promise in reducing neuroticism (for review, see Ilieva 2015).

In addition to pharmacological agents, behavioral interventions have also been developed to target temperament. First, an intervention designed to address behavioral inhibition (elevated distress in novel situations) in children was successful in preventing the onset of future anxiety and related disorders (Rapee et al. 2005). Additionally, a modified, intensive version of the program for higher risk children demonstrated changes in behavioral inhibition (Kennedy et al. 2009). Findings from Rapee et al. (2010) further suggest that interventions targeting temperament might produce an increasing trajectory of change in temperament with time, at least in children. Second, a pilot study by Armstrong and Rimes (2016) evaluated a modified mindfulness-based cognitive therapy (MBCT) intervention designed to specifically target levels of neuroticism. They incorporated language surrounding neuroticism-related constructs, rather than depression-related themes, and demonstrated significantly greater reductions in neuroticism than participants in an intervention that did not specifically target this trait (Armstrong and Rimes 2016). Third, the Unified Protocol for transdiagnostic treatment of emotional disorders (UP) is a cognitive-behavioral treatment for emotional disorders that was explicitly developed to address neuroticism, given its implication in the development and maintenance of these disorders (Barlow et al. 2011). The UP consists of six core treatment modules explicitly designed to extinguish distress in response to the experience of frequent, strong emotions. By doing so, dependency on maladaptive emotion regulatory strategies is reduced, which in turn leads to less frequent and less intense negative emotions over time (see Barlow et al. 2014b; Sauer-Zavala and Barlow 2014). This approach has shown efficacy for the range of anxiety and unipolar depressive disorders (e.g., Barlow et al. in preparation), and there is also preliminary support for the use of the UP with bipolar disorder (Ellard et al. 2012) and posttraumatic stress disorder (PTSD; Gallagher 2015). This growing body of literature suggests that interventions designed to target neuroticism directly may be an effective way of capitalizing on its malleability in the service of improving individuals' health outcomes.

Conclusion

Neuroticism has a rich history in psychology. After drawing a great deal of attention in 1940s, it faded to the background for some time and is now regaining prominence, notably in the realm of clinical psychology. A better understanding of the nature of this trait, as well as its malleability, is contributing to exciting developments in understanding the etiology and treatment of many psychological disorders.

Cross-References

- ▶ Big-Five Model
- ▶ Locus of Control
- ▶ Negative Affectivity
- ▶ Personality and Anxiety
- ▶ Personality and Disease Susceptibility
- ▶ Personality and Dispositional Factors in Relation to Chronic Disease Management and Adherence to Treatment
- ▶ Personality and Memory
- ▶ Personality and Mortality
- ▶ Three-Factor Model of Personality

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: American Psychiatric Association.

Armstrong, L., & Rimes, K. A. (2016). Mindfulness-based cognitive therapy for neuroticism (stress vulnerability): A pilot randomized study. *Behavior Therapy, 47*, 287–298. https://doi.org/10.1016/j.beth.2015.12.005.

Barlow, D. H. (1991). Disorders of emotion. *Psychological Inquiry, 2*, 58–71.

Barlow, D. H., Farchione, T. J., Fairholme, C. P., Ellard, K. K., Boisseau, C. L., Allen, L. B., & Ehrenreich-May, J. (2011). *Unified Protocol for transdiagnostic treatment of emotional disorders: Therapist guide*. New York: Oxford University Press.

Barlow, D. H., Ellard, K. K., Sauer-Zavala, S., Bullis, J. R., & Carl, J. R. (2014a). The origins of neuroticism. *Perspectives on Psychological Science, 9*(5), 481–496. https://doi.org/10.1177/1745691614544528.

Barlow, D. H., Sauer-Zavala, S., Carl, J. R., Bullis, J. R., & Ellard, K. K. (2014b). The nature, diagnosis, and treatment of neuroticism back to the future. *Clinical Psychological Science, 2*(3), 344–365. https://doi.org/10.1177/2167702613505532.

Barlow, D. H., Farchione, T. J., Bullis, J. R., Gallagher, M. W., Latin, H., Sauer-Zavala, S., . . . Cassiello-Robbins, C. (manuscript under review). *Equivalence evaluation of the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders compared to diagnosis-specific CBT for anxiety disorders*.

Bouchard, T. J., & Loehlin, J. C. (2001). Genes evolution, and personality. *Behavior Genetics, 31*(3), 243–273. https://doi.org/10.1023/A:1012294324713.

Brown, T. A. (2007). Temporal course and structural relationships among dimensions of temperament and DSM–IV anxiety and mood disorder constructs. *Journal of Abnormal Psychology, 116*(2), 313–328.

Brown, T. A., & Barlow, D. H. (2009). A proposal for a dimensional classification system based on the shared features of the DSM-IV anxiety and mood disorders: Implications for assessment and treatment. *Psychological Assessment, 21*(3), 256–271. https://doi.org/10.1037/a0016608.

Davenport, J., Bore, M., & Campbell, J. (2010). Changes in personality in pre-and post dialectical behaviour therapy borderline personality disorder groups: A question of self-control. *Australian Psychologist, 45*(1), 59–66.

Eaton, N., Krueger, R., & Oltmanns, T. (2011). Aging and the structure and long-term stability of the internalizing spectrum of personality and psychopathology. *Psychology and Aging, 26*(4), 987–993. https://doi.org/10.1037/a0024406.

Ellard, K. K., Deckersbach, T., Sylvia, L. G., Nierenberg, A. A., & Barlow, D. H. (2012). Transdiagnostic treatment of bipolar disorder and comorbid anxiety with the Unified Protocol: A clinical replication series. *Behavior Modification, 36*(4), 482–508.

Eysenck, H. J. (1947). Student selection by means of psychological tests – A critical survey. *British Journal of Educational Psychology, 17*(1), 20–39.

Freud, S. (1924). *Collected papers*. New York: International Psychoanalytic Press.

Frølund Pedersen, H., Frostholm, L., Søndergaard Jensen, J., Ørnbøl, E., & Schröder, A. (2016). Neuroticism and maladaptive coping in patients with functional somatic syndromes. *British Journal of Health Psychology*. https://doi.org/10.1111/bjhp.12206.

Gallagher, M. W. (2015). Unified Protocol for posttraumatic stress disorder. In D. Barlow & T. Farchione (Eds.), *Applications of the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders*. New York: Oxford University Press.

Gunnar, M. R., & Quevedo, K. (2007). The neurobiology of stress and development. *Annual Review of Psychology, 58*, 145–173. https://doi.org/10.1146/annurev.psych.58.110405.085605.

Helson, R., Jones, C., & Kwan, V. S. (2002). Personality change over 40 years of adulthood: Hierarchical linear modeling analyses of two longitudinal samples. *Journal of Personality and Social Psychology, 83*(3), 752–766.

Ilieva, I. (2015). Enhancement of healthy personality through psychiatric medication: The influence of SSRIs on neuroticism and extraversion. *Neuroethics, 8*(2), 127–137. https://doi.org/10.1007/s12152-014-9226-z.

Kennedy, S. J., Rapee, R. M., & Edwards, S. L. (2009). A selective intervention program for inhibited preschool-aged children of parents with an anxiety disorder: Effects on current anxiety disorders and temperament. *Journal of the American Academy of Child and Adolescent Psychiatry, 48*(6), 602–609.

Lahey, B. B. (2009). Public health significance of neuroticism. *American Psychologist, 64*(4), 241–256. https://doi.org/10.1037/a0015309.

Miller, J. D., & Pilkonis, P. A. (2006). Neuroticism and affective instability: The same or different? *The American Journal of Psychiatry, 163*(5), 839–845. https://doi.org/10.1176/ajp.2006.163.5.839.

Piazza, J. R., Charles, S. T., Sliwinski, M. J., Mogle, J., & Almeida, D. M. (2013). Affective reactivity to daily stressors and long-term risk of reporting a chronic physical health condition. *Annals of Behavioral Medicine, 45*(1), 110–120. https://doi.org/10.1007/s12160-012-9423-0.

Rapee, R. M., Kennedy, S., Ingram, M., Edwards, S., & Sweeney, L. (2005). Prevention and early intervention of anxiety disorders in inhibited preschool children. *Journal of Consulting and Clinical Psychology, 73*(3), 488–497. https://doi.org/10.1037/0022-006X.73.3.488.

Rapee, R. M., Kennedy, S. J., Ingram, M., Edwards, S. L., & Sweeney, L. (2010). Altering the trajectory of anxiety in at-risk young children. *The American Journal of Psychiatry, 167*(12), 1518–1525. https://doi.org/10.1176/appi.ajp.2010.09111619.

Sauer-Zavala, S., & Barlow, D. H. (2014). The case for borderline personality disorder as an emotional disorder: Implications for treatment. *Clinical Psychology: Science and Practice, 21*(2), 118–113. https://doi.org/10.1111/cpsp.12063.

Shiner, R. L., Buss, K. A., McClowry, S. G., Putnam, S. P., Saudino, K. J., & Zentner, M. (2012). What is temperament now? Assessing progress in temperament research on the twenty-fifth anniversary of Goldsmith et al.(). *Child Development Perspectives, 6*(4), 436–444. https://doi.org/10.1111/j.1750-8606.2012.00254.x.

Warner, M. B., Morey, L. C., Finch, J. F., Gunderson, J. G., Skodol, A. E., Sanislow, C. A., Shea, M. T., McGlashan, T. H., & Grilo, C. M. (2004). The longitudinal relationship of personality traits and disorders. *Focus, 3*(3), 465–477.

Westlye, L. T., Bjornebekk, A., Grydeland, H., Fjell, A. M., & Walhovd, K. B. (2011). Linking an anxiety-related personality trait to brain white matter microstructure: Diffusion tensor imaging and harm avoidance. *Archives of General Psychiatry, 68*(4), 369–377. https://doi.org/10.1001/archgenpsychiatry.2011.24.

Wiersma, J. E., van Oppen, P., van Schaik, D. J., van der Does, A. W., Beekman, A. T., & Penninx, B. W. (2011). Psychological characteristics of chronic depression: A longitudinal cohort study. *The Journal of Clinical Psychiatry, 72*(3), 288–294.

Zinbarg, R. E., Mineka, S., Bobova, L., Craske, M. G., Vrshek-Schallhorn, S., Griffith, J. W., et al. (2016). Testing a hierarchical model of neuroticism and its cognitive facets latent structure and prospective prediction of first onsets of anxiety and unipolar mood disorders during 3 years in late adolescence. *Clinical Psychological Science, 4*(5), 805. https://doi.org/10.1177/2167702615618162.

Neuroticism (Eysenck's Theory)

Per Bech
University of Copenhagen, Hillerød, Denmark

Synonyms

EPI; EPQ; EPQ-R; MMQ; MPI; Short-scale EPQ-R

Definition

The Eysenck personality theory is based on the four classic temperaments (melancholic, choleric, phlegmatic, and sanguine) which Wilhelm Wundt integrated in the two dimensions of neuroticism and extraversion. Neuroticism covers the melancholic and choleric temperaments as a personality trait, i.e., a disposition-oriented tendency to react too emotionally in certain situations. Neuroticism, or emotionality, is the most distinct of Eysenck's personality traits. It was also historically the first trait he defined. Thus, the Maudsley Medical Questionnaire (MMQ) was constructed to measure the personality trait of neuroticism. The MMQ contained 40 items. To cover both neuroticism and extraversion, the Maudsley Personality Inventory (MPI) was developed in 1956. A short version of the MPI containing six neuroticism items was published by Eysenck in 1958.

The Eysenck Personality Inventory (EPI) was developed by Eysenck and Eysenck in 1959. In this version, a Lie subscale was included to evaluate the respondent's test-taking behavior, i.e., the extent to which the individual was "faking good." The Eysenck Personality Questionnaire (EPQ) (Eysenck and Eysenck 1975) should be considered as the final measure of the Eysenck personality traits of neuroticism, extraversion (Bech 2017a), or psychoticism (Bech 2017b), still including the Lie subscale with 21 items. However, Eysenck et al. (1985) ultimately published a

revised version (EPQ-R) in which one single extra item concerning the neuroticism scale was added to the 1975 version, but this item is of doubtful validity and is not included in the short-scale EPQ-R (Table 1). The Lie subscale in the EPQ-R was the unchanged 21-item version.

Introduction

From Eysenck's first neuroticism scale (MMQ) in 1952 till the final neuroticism scale (EPQ-R) in 1985, the questions were worded in one direction so that the "Yes" response is related to the severity of neuroticism (Table 1). Eysenck and Eysenck (1969) conclude that to list the neuroticism items analogue to a list of symptoms in a depression scale is the most acceptable method. This is in concordance with De Vellis (2012) who has shown that the disadvantages of using items worded in opposite directions outweigh any benefits. The problems in the NEO Personality Inventory neuroticism scale (Bech et al. 2016a), in which items with opposite directions are incorporated, resulted in two subscales, one measuring euthymia and the other dysthymia. Kendell and DiScipio (1968) investigated formulating the Eysenck neuroticism items analogue to symptom depression scales. A fundamental requirement of any personality trait measure should be a relative independence when used in patients with a current state of depression so that the degree of depression severity is not reflected in their responses. Therefore, Kendell and DiScipio (1968) included the following instruction to the neuroticism scale: "Try to disregard your illness when answering these questions and answer 'Yes' or 'No' according to how you feel or behave when you are your usual self." When measuring current states of depression or anxiety, we are focusing on relatively short-term conditions with a time frame of the past days or weeks. However, when

Neuroticism (Eysenck's Theory), Table 1 The short-scale neuroticism items in EPQ-R (1985) with the corresponding item number in EPQ (1975) and the full EPQ-R (1985)

Item number				Answer	
Short-scale EPQ-R (1985)	EPQ (1975)	EPQ-R (1985)	The neuroticism questions	Yes = 1	No = 0
1	3	3	Does your mood often go up and down?	☐	☐
5	7	8	Do you ever feel "just miserable" for no reason?	☐	☐
9	15	17	Are you an irritable person?	☐	☐
13	19	22	Are your feelings easily hurt?	☐	☐
17	23	26	Do you often feel "fed-up"?	☐	☐
46	27	31	Are you often troubled about feelings of guilt?	☐	☐
21	31	35	Would you call yourself a nervous person?	☐	☐
25	34	38	Are you a worrier?	☐	☐
30	41	46	Would you call yourself tense or "highly strung"?	☐	☐
34	66	74	Do you worry a lot about your looks?	☐	☐
38	75	83	Do you suffer from "nerves"?	☐	☐
42	77	84	Do you often feel lonely?	☐	☐

The key answer for each of the 12 items is "Yes" = 1 and consequently "No" = 0
Higher scores (from 0 to 12) indicate a higher degree of neuroticism

measuring the frame of mind in determinate terms for dispositional statements, we are measuring a personality trait such as neuroticism (Bech 2016).

As a questionnaire for the personality trait of neuroticism, the Eysenck scale focuses on how the person feels or behaves when in his or her usual self so as to measure the dispositional traits, not the person's momentary mood. This is in contrast to Cattell's theory of neuroticism in which the current state is focused on, rather than on the fixed personality trait.

Psychometric Properties

The Validity of the Eysenck Neuroticism Scale by Factor Analysis

The final EPQ or EPQ-R neuroticism scale was psychometrically validated by several factor analytic studies, as was the very first version (the Maudsley Medical Questionnaire). The factor analytic identification of the neuroticism items versus the extraversion items in the Maudsley Personality Inventory illustrated by their lack of intercorrelations the psychometric factor validation of the two dimensions. Eysenck and Eysenck (1969) concluded that it was actually the Hotelling Principal Components solution rather than sophisticated factor rotations that identified these two main factors: neuroticism and extraversion.

The Clinical Validity of the Eysenck Neuroticism Scale

Eysenck never evaluated the clinical validity of his neuroticism scale. Thus, most of Eysenck's factor analytic studies have been carried out on nonclinical populations, typically college students. Using a clinical population of patients with different types of depression, the EPQ neuroticism scale was evaluated, using an experienced psychiatrist with competence in neurotic disorders as index of clinical validity (Bech et al. 1986). When compared to other personality questionnaires, the EPQ neuroticism scale was the only one to correspond significantly with the experienced psychiatrist's assessment.

The Validity of the EPQ Neuroticism Scale by Item Response Theory Analysis

The 23-item EPQ neuroticism scale was evaluated by the nonparametric item response theory model (Bech et al. 2016b). In this model, developed by Mokken, the scalability of the neuroticism scale is evaluated by a coefficient of homogeneity. In contrast to factor analysis, the Mokken analysis is a measurement model which evaluates to what extent the items can be ranked by their location on the latent dimension which is being tested, i.e., the degree of neuroticism. This is tested by the coefficient of homogeneity. A coefficient value of 0.40 or higher indicates a clear scalability, implying an additive structure of the items, i.e., that their summed total score is a sufficient measure of neuroticism. Bech et al. (2016a, b) obtained a coefficient of homogeneity of 0.43 in the EPQ neuroticism scale in patients with first episode of depression who had completed the neuroticism scale when in remission from their depression.

The Predictive Validity of the Eysenck Neuroticism Scale

The dispositional nature of the Eysenck neuroticism scale implies that predictive validity is inherently the most important part of its validity. The patients mentioned above who were tested after remitting from their first-episode depression (Bech et al. 2016a, b) were reanalyzed at a 5-year follow-up interview. Using the Hamilton Depression Scale with a score of 8 or more at the 5-year follow-up interview as criterion of validity, it was found (Bech et al. 2016b) that the Eysenck neuroticism scale (a score of 14 or more) was able to predict depression, in contrast to the Hamilton Depression Scale ($P < 0.05$).

In another study using the EPI neuroticism scale, an attempt was made to identify the items which predicted non-remission after 6 months of treatment in patients with generalized anxiety disorder (Bech and Rickels 2016). In this study, a score of 8 or more on the Hamilton Anxiety Scale was the criterion of non-remission. Six items in the EPI neuroticism scale were identified as the most significant predictor items of non-remission. When using the neuroticism items from the short-scale EPQ-R, five of the six items are included

(Table 1), namely, *being a nervous person*, *feeling easily hurt*, *mood goes up and down*, *feeling miserable*, and *guilt feelings*. Only the item of sleeplessness, which is the remaining somatic neuroticism item in the EPQ or EPQ-R when compared to the original MMQ, is missing.

Conclusion

When using the Eysenck neuroticism scale, it is important to indicate which version is being tested. The EPQ neuroticism scale (Eysenck and Eysenck 1975) with its 23 items is still the most used internationally. Very few studies with the 24-item EPQ-R (Eysenck et al. 1985) have been published. The great strength of the EPQ neuroticism scale is its validity (clinical validity, psychometric scalability, and predictive validity). Neuroticism is the most distinct personality trait in the EPQ. The neuroticism factor in the NEO Personality Inventory is also the most distinct of the five factors included in this scale. However, from a psychometric point of view, the EPQ neuroticism scale should be considered the most important. It is about as good as can be desired (Kline 1993).

References

Bech, P. (2016). Measurement-based care in mental disorders. New York: Springer

Bech, P. (2017a). Extraversion-introversion (Eysenck's theory). In V. Zeigler-Hill & T. K. Shackelford (Eds.), *Encyclopedia of personality and individual differences.* Springer.

Bech, P. (2017b). Psychoticism (The psychoticism scale). In V. Zeigler-Hill & T. K. Shackelford (Eds.), *Encyclopedia of personality and individual differences.* Springer.

Bech, P., & Rickels, K. (2016). The items predicting non-remission after 6 months of treatment of patients with generalized anxiety disorder covered the Eysenck neuroticism components of anxiety, interpersonal sensitivity and depression. *Psychotherapy and Psychosomatics, 85*(4), 229–230. https://doi.org/10.1159/000444454.

Bech, P., Jorgensen, B., Jeppesen, K., Loldrup Poulsen, D., & Vanggaard, T. (1986). Personality in depression: Concordance between clinical assessment and questionnaires. *Acta Psychiatrica Scandinavica, 74*(3), 263–268.

Bech, P., Carrozzino, D., Austin, S. F., Moller, S. B., & Vassend, O. (2016a). Measuring euthymia within the neuroticism scale from the NEO personality inventory: A Mokken analysis of the Norwegian general population study for scalability. *Journal of Affective Disorders, 193*, 99–102. doi:S0165-0327(15)31185-X [pii].

Bech, P., Kessing, L. V., & Bukh, J. D. (2016b). The validity of dysthymia to predict clinical depressive symptoms as measured by the Hamilton depression scale at the 5-year follow-up of patients with first episode depression. *Nordic Journal of Psychiatry, 70*(8), 563–566. https://doi.org/10.1080/08039488.2016.1180712.

De Vellis, P. F. (2012). *Scale development. Theory and application* (3rd ed.). London: SAGE.

Eysenck, H. J., & Eysenck, S. B. G. (1969). *Personality structure and measurement*. London: Routledge & Kegan Paul.

Eysenck, H. J., & Eysenck, S. B. G. (1975). *Manual of the Eysenck personality questionnaire*. London: Hodder and Stoughton.

Eysenck, S. B. G., Eysenck, H. J., & Barrett, P. (1985). A revised version of the psychoticism scale. *Personality and Individual Differences, 6*(1), 21–29.

Kendell, R. E., & DiScipio, W. J. (1968). Eysenck personality inventory scores of patients with depressive illnesses. *The British Journal of Psychiatry: The Journal of Mental Science, 114*(511), 767–770.

Kline, P. (1993). *The handbook of psychological testing*. London: Routledge.

Neurotransmitter Assays

William Procunier[1] and Richard Procunier[2]

[1]Department of Psychology, Nipissing University, North Bay, ON, Canada

[2]Northern Shores Pharmacy, North Bay, ON, Canada

Definitions

Omics technology	Technology used in the integration of genomics, proteomics, and metabolomics; high throughput isolation, identification and functional characterization of genes, their protein (peptide) products, and associated biochemical pathways and interactions.

Optogenetics	Methods that involve the use of optics, genetics, and DNA recombinant technology to target distinct neuronal populations from brain tissue slices (ex vivo) with genes that produce bacterial opsins. These ion-channel membrane-associated proteins can be stimulated selectively by light and visualized through fluorescent tagging. The essential reagents used in optogenetics are light-sensitive proteins. Neuronal control is achieved using optogenetic enhancers, while optical recording of neuronal activities can be made with the help of optogenetic sensors for calcium, vesicular release, neurotransmitter, or membrane voltage (McElligott 2015; Touriño et al. 2013).
Chemogenetics	A term coined to describe a process where larger molecules are manufactured to interact with smaller previously unrecognized ones. G protein-coupled receptors can be engineered to respond exclusively to synthetic small molecular ligands and not to their natural ligand(s) that permits spatial and temporal control of G protein signaling in vivo. Neuronal excitation or silencing occurs through the expression of G protein-coupled receptors activated by designer drugs called DREADD's (Designer Receptor Exclusively Activated by Designer Drugs). For both genetic approaches, selective cellular genetic constructs occur as a result of recombinase dependent opsin/DREADD expression in tandem with neuron-specific recombinase expression recognized by specific cell types that allow control over cells at a subcellular level (McElligot 2015; Stachniak et al. 2014).

Introduction

The focus of this chapter will be on aspects of the advances in the development and uses of neurotransmitter assays for a better understanding of neurotransmission in the context of translational research. Translational research and its outcomes are being used to bring precision medicine into the mainstream for personalized healthcare, from genetics to cognition/behavior – integration of the "omics" and other technologies. Different types of neurotransmitter assays have been and are key in this process. An informatics approach will be used to bring the reader a cross section of databases and resources that can be used for research and educational purposes in the identification and characterization of molecules, processes, and circuitry associated with synaptic transmission.

Traditionally, in both academic and pharmaceutical research, biological assays have attempted to characterize structural/functional aspects of a synapse during neurotransmission using various animal models and cell culture as they apply to normal and pathological conditions. For example, early bioassays used protocols to study the uptake and release of tritiated substrates using intact cells or synaptosomes. In this way one could investigate drug effects on selective transporter-mediated uptake and release of the tritiated substrate. Parallel experiments used high-performance liquid chromatography (HPLC) procedures for electrochemical detection of non-radiolabeled substrates (Janosky et al. 2001). More recently, studies have utilized electrophysiological measurements of receptors that

have looked at a specific receptor class, the endocannabinoids (eCBs). These molecules are a class of bioactive lipids that mediate retrograde synaptic modulation at central and peripheral synapses. Protocols were developed for measuring cannabinoid and eCB-mediated synaptic signaling in mouse brain slices, including analysis of short-term, long-term, and tonic eCB signaling modes (Báldi et al. 2016*)*. Finally, complementary computation studies have also been undertaken to further elucidate aspects of the general synapse. Extracellular neurotransmitter concentrations can vary over a wide range depending on the type of neurotransmitter and location in the brain. A biophysical modeling framework was proposed, based on a cortico-accumbens. The model was used to identify the role of perisynaptic parameters on neurotransmitter homeostasis and to propose glial configurations that could support different levels of extracellular neurotransmitter concentrations (Pendyam et al. 2012).

Basic Biology: Importance of Classification for Identification and Function of Synaptic Molecules

In order to understand neurotransmitter assays, one needs to understand the basic biology of the synapse and neuronal firing. Whether this is chemical or electrical, it involves the following structures and the regulation and formation of multiple nuclear gene products. Generally, one must keep in mind the pre- and postsynaptic neurons (internal secretory vesicles/organelles), their receptors and the synaptic cleft with the regulated release and uptake of neurotransmitter(s) and associated transporters.

Furthermore, proper classification and identification of synaptic molecules and their annotation is essential in experimental design. Some information on classification and function of synaptic molecules follows including that for neurotransmitters and their specific transporters. Classification of the major neurotransmitter families comprise amines (quaternary, e.g., acetylcholine and mono, e.g., dopamine), amino acids (e.g., glutamate), neuropeptides (opioids), peptides (e.g., oxytocin), and gases (e.g., nitric oxide). Functionally, vesicular neurotransmitter transporters can mediate storage inside secretory vesicles in a process that involves the exchange of lumenal H+ for cytoplasmic transmitter. Retrieval of the neurotransmitter from the synaptic cleft catalyzed by sodium-coupled transporters is critical for the termination of the synaptic actions of the released neurotransmitter (Elbaz et al. 2010).

An example of their general classification system and complex biology can be found for sodium neuro-transporter serotonin symporter, and, in this case, specifically its N terminal domain. Most reference sites referred to in the text provide tutorials on how to navigate their databases, and in this example we provide links to the molecule's biological domains/function/process and its detailed source description (http://www.ebi.ac.uk/interpro/entry/IPR013086).

"Neurotransmitter transport systems are integral to the release, reuptake, and recycling of neurotransmitters at synapses. High affinity transport proteins found in the plasma membrane of presynaptic nerve terminals and glial cells are responsible for the removal from the extracellular space of released-transmitters, thereby terminating their actions (PMID: 15336049). Plasma membrane neurotransmitter transporters fall into two structurally and mechanistically distinct families. The majority of the transporters constitute an extensive family of homologous proteins that derive energy from the cotransport of Na^+ and Cl^-, in order to transport neurotransmitter molecules into the cell against their concentration gradient. The family has a common structure of 12 presumed transmembrane helices and includes carriers for gamma-aminobutyric acid (GABA), noradrenaline/adrenaline, dopamine, serotonin, proline, glycine, choline, betaine, and taurine. They are structurally distinct from the second more-restricted family of plasma membrane transporters, which are responsible for excitatory amino acid transport. The latter couple glutamate and aspartate uptake to the cotransport of Na^+ and the counter-transport of K^+, with no apparent dependence on Cl^- (PMID: 8811182). In addition, both of these transporter families are distinct

from the vesicular neurotransmitter transporters (PMID: 8103691, PMID: 7823024).

Biological process GO:0006836 neurotransmitter transport.

Molecular Function

GO:0005335 serotonin/sodium symporter activity.

Cellular Component

GO:0005887 integral component of plasma membrane " (EMBL-EBI 2016).

Current Approaches for Investigating Genetic Variation and Function of Synaptic Molecules

New assays, in contrast to older ones, will put more emphasis on identifying and characterizing genic variation and their pathogenic variants associated with these molecules. Identifying these variants will be important in the design and validation of current synaptic bioassays. This information coupled with pharmacogenomics profiles that identifies drug metabolism variation in individuals will provide leads for drug discovery and more efficacious targeted treatment for personalized healthcare.

One such site that documents omic's information on synaptic molecules is Genecards (http://www.genecards.org) (Weizmann Institute of Sciences 2016a). It provides information on summaries, genomics including products for regulatory elements and epigenetics, proteins, their attributes, protein products, antibodies and bioassays, domains and protein families of the gene product and function, pathways and interactions, drugs and compounds, expression products, and gene variants. An example for a product inquiry and link follows: http://sabiosciences.com/neuroscience.php (Sabiosciences 2016). This company provides PCR arrays and protocols to profile different neurotransmitters, neurotrophins, ion channels, and neurogenesis processes.

In the context of the subject matter for the encyclopedia, a general link to personality disorders can be found at MalaCards. This site facilitates queries into human disease (http://www.malacards.org/search/results/personality%20disorders) and provides information on genes, tissues, related diseases, publications, pathways, drugs (Weizmann Institute of Sciences 2016). For example, the solute carrier family 6 (neurotransmitter transporter), member 4, is a gene associated with personality disorders along with nine others (http://www.genecards.org/cgi-bin/carddisp.pl?gene=SLC6A4) (Weizmann Institute of Sciences 2016b).

Advances in Monitoring Neurotransmission

The development of optogenetic and chemogenetic tools has provided a more precise way for probing circuit dynamics in the brain. Optogenetic methods involve the use of optics, genetics, and DNA recombinant technology to target distinct neuronal populations from brain tissue slices (ex vivo) with genes that produce bacterial opsins. These ion-channel membrane-associated proteins can be stimulated selectively by light and visualized through fluorescent tagging. The essential reagents used in optogenetics are light-sensitive proteins. Neuronal control is achieved using optogenetic enhancers, while optical recording of neuronal activities can be made with the help of optogenetic sensors for calcium, vesicular release, neurotransmitter, or membrane voltage. This light-based method is in contrast to the analytical method of fast scan analytical voltammetry (FSCV) which utilizes electrical stimulation in vivo to study neurotransmitter release (McElligott 2015; Touriño et al. 2013).

Chemogenetics is a term coined to describe a process where larger molecules are manufactured to interact with smaller previously unrecognized ones. G protein-coupled receptors can be engineered to respond exclusively to synthetic small molecular ligands, like clozapine oxide (CNO), and not to their natural ligand(s) that permits spatial and temporal control of G protein

signaling in vivo. Neuronal excitation or silencing can occur through the expression of G protein-coupled receptors activated by designer drugs called DREADD's (Designer Receptor Exclusively Activated by Designer Drugs). These designer receptors act on endogenous intracellular pathways, whereas optogenetic constructs act on ion channels or pumps. For both genetic approaches, selective cellular genetic constructs occur as a result of recombinase dependent opsin/DREADD expression in tandem with neuron-specific recombinase expression. Newer constructs involve viral encoding of promoter regions that recognize specific cell types and allow control over cells at a subcellular level (Stachniak et al. 2014; McElligott 2015).

The aforementioned approaches are being combined with fast scan cyclic voltammetry (FSCV) to better understand neurotransmission dynamics. FSCV is an analytical method that measures changes in neurotransmitter concentrations over short time intervals through electrical stimulation or behaviourally induced neurotransmitter release. It has been used to characterize the dynamics of dopamine uptake and release in the subregions of the striatum. The application of these technologies should refine spatial neural circuitry mapping of the brain and further our understanding of neurotransmission dynamics by more precisely defining/differentiating neurotransmitter types and their signaling components (McElligot 2015; Stachniak et al. 2014; Touriño et al. 2013).

A similar successful approach that combines optogenetics, microscopy, and electrophysiology to study cellular communication can be found through a webinar link provided by Andor Technology and Lab Roots (http://www.labroots.com/webcast/the-benefits-of-combining-optogenetics-microscopy-and-electrophysiology). Signaling pathway elements can be genetically modified to enable precise and spatially targeted light control of biology down to a single cell level. Targeted light can be used in order to control neuronal excitation and so gain better insight into how nerve cells communicate within the context of a network and their impact on the whole organism (Wilde 2016).

High Throughput Analysis: Complexity of Assaying Variants/Subtypes

Detailed discussion of high throughput approaches/screening/analysis for drug study discovery/selection that can involve many agonist/antagonist synaptic molecules is not in the scope of this chapter. However, a link to such studies is provided through PubChem with an example description of a specific subtype (variant), the protein target 5-hydroxytryptamine (serotonin) receptor 1A (*Homo sapiens*) (https://pubchem.ncbi.nlm.nih.gooassay/567#section=Topv/bi). "Widely expressed in the human brain, 5-hydroxytryptamine (5-HT, serotonin) receptors have been shown to have an important role in depression as well as other cognitive and metabolic disorders. Agonists to 5-HT1a subtype, a protein-coupled heterotrimeric G receptor that inhibits production of cyclic adenosine mono phosphate (cAMP), have been shown useful as anxiolytics and antidepressants. Discovering novel modulators of the 5-HT1a serotonin receptor may not only help probe the function of this receptor, but also help better understand the complex relationship among the 5-HT receptor subtypes (NCBI PubChem Open Chemistry Database 2016)."

This bioassay record (AID 567) belongs to the assay project for drug development "Summary of the probe development efforts to identify agonists of the 5-Hydroxytryptamine Receptor Subtype 1E (5HT1E)." It can also be associated with the summary AID 1676 and a total of nine additional BioAssay records in PubChem.

Similarly, for an example of high throughput electrophysiological studies, the reader is referred to http://www.labroots.com/webinar/novel-applications-automated-electrophysiology-ion-channel-drug-discovery?

"Voltage-gated ion channels represent important drug targets. This assay allows for robust assessment of state-dependent effects of test agents and enables direct comparison of compound potency across several ion channel subtypes at equivalent levels of inactivation. In addition to determination of state dependency and selectivity, the assay provides valuable information on the kinetics of compound association and disassociation (Cern 2016)."

Complementary imaging information on aspects of structure/function of the human brain and its mapping (Beatty et al. 2015) also provides new insights into brain organization/circuity and may potentially validate neurotransmission findings. A general link to imaging studies can be found at http://www.humanconnectomeproject.org (NIH HumanConnectome project 2016).

Conclusion

An informatics approach was used to inform the reader of progress in translational research to better understand the process of neuronal transmission and to provide some insight into the complexity of identifying and characterising synaptic molecules and their population variants. The use of bioassays that incorporate optogenetic and chemogenetic approaches, electrophysiological methods/tools, and microscopy is contributing to improve our knowledge of synaptic transmission and neural circuitry in normal and disease states.

Cross-References

- ▶ Behavioral Genetics
- ▶ Dopamine
- ▶ Endophenotypes, Personality, and Mental Disorder
- ▶ GABA
- ▶ Gene-Environment Interplay in Developmental Psychopathology
- ▶ Genetic Polymorphism
- ▶ Genotype-Environment Interactions
- ▶ Human Genome Project
- ▶ Metabolic Syndrome
- ▶ Molecular Cellular Cognition
- ▶ Molecular Genetics
- ▶ Neural Networks

References

Báldi, R., Ghosh, D., Grueter, B. A., & Patel, S. (2016). Electrophysiological measurement of cannabinoid-mediated synaptic modulation in acute mouse brain slices. *Current Protocols in Neuroscience, 75*, 6.29.1–6.29.19. https://doi.org/10.1002/cpns.8.

Beaty, R., Kaufman, S., Benedek, M., Jung, R., Kenett, Y., Jauk, E., Neubauer, A., & Silvia, P. (2015). Personality and complex brain networks: The role of openness to experience in default network efficiency. *Human Brain Mapping, 37*, 773–779. https://doi.org/10.1002/hbm.23065.

Cern, R. (2016). Novel high throughput approach to evaluate state dependence and selectivity of voltage gated ion channels. Webinar retrieved from http://www.labroots.com/webinar/novel-applications-automated-electrophysiology-ion-channel-drug-discovery?

Elbaz, Y., Danieli, Y., Kanner, B., & Schuldiner, S. (2010). Expression of neurotransmitter transporters for structural and biochemical studies. *Protein Expression and Purification, 73*(2), 152–160. https://doi.org/10.1016/j.pep.2010.06.

EMBL-EBI. (2016). Interpro sequence analysis and classification. Retrieved from http://www.ebi.ac.uk/interpro/entry/IPR013086

Janowsky, A., Neve, K., & Eshleman, A. (2001). Uptake and release of neurotransmitters. *Current Protocols in Neuroscience, 2*, 7.9.1–7.9.22.

McElligott, Z. (2015). Optogenetic and chemogenetic approaches to advance monitoring molecules. *ACS Chemical Neuroscience, 6*, 944–947. https://doi.org/10.1021/acschemneuro.5b00081.

NCBI PubChem Open Chemistry DataBase. (2016). Bioassay Record for AID 567. Retrieved from https://pubchem.ncbi.nlm.nih.gooassay/567#section=Topv/bi

NIH HumanConnectome Project. (2016). Retrieved from http://www.humanconnectomeproject.org/

Pendyam, S., Mohan, A., Kalivas, P., & Nair, S. (2012). Role of perisynaptic parameters in neurotransmitter homeostasis—computational study of a general synapse. *Synapse, 66*, 608–621. https://doi.org/10.1002/syn.21547.

SaBiosciences a Qiagen Company. (2016). Neuroscience. Retrieved from http://sabiosciences.com/neuroscience.php

Stachniak, T., Ghosh, A., & Sternson, S. (2014). Chemogeentic synaptic silencing of neural circuit localizes a hypothalamus-midbrain pathway for feeding behaviour. *Neuron*, *82*, 797–808. https://doi.org/10.1016/j.neuron.2014.04.008. Epub 2014 Apr 24.

Touriño, C., Eban-Rothschild, A., & de Lecea, L. (2013). Optogenetics in psychiatric diseases. *Current Opinion in Neurobiology, 23*(3), 430–435. https://doi.org/10.1016/j.conb.2013.03.007.

Weizmann Institute of Science. (2016a). The human disease database. Retrieved from http://www.malacards.org/search/results/personality%20disorders

Weizmann Institute of Science. (2016b). The human gene database. Retrieved from http://www.genecards.org/cgi-bin/carddisp.pl?gene=SLC6A4

Wilde, G. (2016). The benefits of combining optogenetics, microscopy and electrophysiology. Webinar. Retrieved from http://www.labroots.com/webcast/the-benefits-of-combining-optogenetics-microscopy-and-electrophysiology

Neutral Information Processing

► Cold Cognition

New York Longitudinal Study (NYLS)

Margaret E. Hertzig
Weill Cornell Medicine, New York, NY, USA

Definition

It can be defined as Study of Temperament during infancy, childhood, adolescence and young adulthood.

Introduction

The New York Longitudinal Study (NYLS), launched by Alexander Thomas and Stella Chess in 1956, marks the beginning of modern interest in the study of temperament. Although the scientific study of temperament is relatively recent, the idea of grouping human beings into basic behavioral types is centuries old. Historically, temperament refers to those biologically based differences between individuals that emerge early in life and are expressed with relative consistency across situations and over time. Galen described four basic temperaments – choleric, melancholic, sanguine, and phlegmatic – attributable to a preponderance of one or another of Hippocrates's four cardinal humors, black bile, yellow bile, phlegm, and blood. In the early years of the twentieth century, Kretchmer in Germany and Sheldon in the United States examined the relationship between basic temperaments and endomorphic, mesomorphic, and ectomorphic body types. As the century progressed, individual differences with respect to a range of discrete functional areas including motility, perceptual responses, sleeping and feeding patterns, autonomic response patterns, and biochemical individuality had begun to be described in infants and young children. However efforts to relate early individual differences to later psychological organizations were only minimally successful (Thomas et al. 1960).

Thomas and Chess did not set out to study temperament. Dissatisfied with the prevailing wisdom of the time which held that individual differences in behavior resulted from the differential impact of environment and experience during development, they sought to explore what children might contribute to their own development. By identifying aspects of behavioral individuality early in life and tracing their vicissitudes over time, these investigators sought to (1) determine the persistence of these initially identified characteristics and (2) delineate their pertinence to later psychological organizations including the possible emergence of psychopathology. Thomas and Chess were clinicians, not trained investigators. Nevertheless they were committed to the development of a research methodology that would insure that the techniques used to gather and analyze data were reliable, valid, and reproducible by others. Their success in this regard accounts for the success of the investigation and the ongoing influence of its findings (Hertzig 2012).

Subjects and Methods

The NYLS sample consisted of 133 children (67 males, 66 females) from 85 families, recruited over 12 years. When enrolled, subjects, who derived from intact, highly educated, and economically well-situated families, were under 3 months of age. Parents were the primary source of information about their children. A semi-structured interview protocol, informed by the Gesell Behavior Day (1942), was developed, and parents were interviewed when their children were 3 months of age and at 3-month intervals during the first year and at 6-month intervals until 5 years and yearly thereafter. Parents were guided to provide details of their child's behavior during activities of daily living including sleep, feeding, dressing and undressing, bathing, responses to sensory stimuli, new situations, and illnesses. As

the children grew older, parents were questioned about additional developmentally appropriate activities including play patterns, responses to discipline, acquisition of self-care skills, and peer relationships. Individually administered cognitive assessments were obtained at 3, 6, and 9 years of age, and the children were observed and their teachers interviewed in nursery school, kindergarten, and 1st grade. Psychiatric consultation was made available "on demand." At 16 years, children and parents were interviewed separately about school functioning, extracurricular activities, sexual behavior, drug use, current problems, and future plans. A specially designed measure of adult temperament was administered when subjects were between 18 and 22 years of age at which time they were again interviewed individually. A narrative summary of all contacts with informants was prepared within 24 h (Thomas et al. 1963; Thomas and Chess 1977, 1984).

Analysis of Data

The narrative summaries of 60 parental interviews (20 children at 3, 6, and 9 months) were subjected to an inductive content analysis which resulted in the identification of 9 temperamental categories defined as follows:

1. Activity level: The motor component present in a child's functioning.
2. Rhythmicity (regularity): The predictability or unpredictability in time of any biologic function.
3. Approach or withdrawal: The nature of the initial response to a new stimulus (e.g., new food, new toy, new person). Approach responses are positive and withdrawal reactions negative, whether displayed by mood expression or motor activity.
4. Adaptability: This category describes the ease with which an initial response (irrespective of its character) can be modified in the desired direction.
5. Threshold of responsiveness: The intensity level of stimulation that is necessary to evoke a discernible response regardless of the specific form that the response may take or the sensory modality affected.
6. Intensity of reaction: The energy level of response regardless of its quality or direction.
7. Quality of mood: The amount of pleasant, joyful, and friendly behavior, as contrasted with unpleasant, crying, or unfriendly behavior.
8. Distractibility: The effectiveness of extraneous environmental stimuli in interfering with or altering the direction of the ongoing behavior.
9. Attention span and persistence: Two categories that are related. Attention span concerns the length of time the child pursues a particular activity; persistence refers to the continuation of an activity direction in the face of obstacles.

Each category was scored on a 3-point Likert scale (high, intermediate, or low), and each category was scored independently to avoid halo effects. Reliability (0.01 level of confidence) was obtained between two independent scorers. Validity of NYLS parent's reports was assessed through comparison with two direct observations conducted different times within 2 weeks of the parent interviews. Each direct observation was found to agree with the parent interview at the 0.01 level of confidence (Thomas et al. 1963).

Results

Initially, quantitative analysis of the NYLS data was directed toward the exploration of stability of temperamental attributes over time. Year-to-year consistency of each of the nine temperamental attributes was examined through the first 5 years of life using correlational techniques. Correlations from 1 year to the next ranged from 0.05 to 0.51. All were statistically significant with the exception of approach/withdrawal (years 1–2, 2–3), distractibility (years 1–2, 2–3, 3–4), and persistence (years 1–2, 4–5). As the time between years compared was increased to 2, 3, or 4 years, the number of significant correlations decreased accordingly (Thomas and Chess 1977, p. 161, Thomas and Chess 1982).

Factor analysis of the nine individual temperamental attributes led to the identification of three temperamental constellations: Children with an easy temperament (40%) were characterized by

regularity, positive approach responses to new stimuli, rapid adaptability to change, and mild or moderate predominantly positive intensity of mood. Children described as temperamentally difficult (10%) displayed irregular biological functions, predominantly negative withdrawal responses to new situations, slow adaptability to change, and intense expression of predominately negative mood. Children who were slow to warm up (15%) displayed the temperamental attributes of initial withdrawal to new situations, combined with slow adaptability and mild intensity. The remaining 35% displayed different combinations of temperamental attributes, so in order to include the entire sample in subsequent quantitative analyses, an index of difficulty was constructed for each child by determining the means of the scores of the five categories that made up the difficulty child temperamental constellation. The pattern of inter-year correlations for the index of difficulty was similar to that obtained when each temperamental attribute was considered separately. Although few significant correlations between individual temperamental attributes during childhood and early adulthood were obtained, difficult temperament at year 3 was found to be significantly negatively correlated with an omnibus measure of early adult adjustment (Chess and Thomas 1990, p. 207).

These results suggest that consistency of temperamental attributes over time is unlikely to account for more that 10–15% of the variance. Thomas and Chess have proposed that genetic, developmental, and environmental factors all contribute to this substantial potential for change. Additionally they have emphasized that the temperamental differences between NYLS subjects, whether described qualitatively as *easy*, *difficult*, *or slow to warm up* or quantitatively by the magnitude of the *index of difficulty*, are to be understood as variations within the range of usually expectable behavior. Even a relatively extreme score for a specific temperamental attribute is not, in and of itself, to be considered as evidence for psychopathology (Chess and Thomas 1990).

Nevertheless, the risk of developing a clinically significant behavior disorder was different for children with different temperamental characteristics. The *difficult* children were at the greatest risk; of the 10% of the NYLS sample who were characterized as difficult, 71% were found to have behavior problems. In the much larger group of *easy* children (40% of the total NYLS sample), behavior problems were found in less than 7%. The *slow-to-warm-up* children were also at somewhat higher risk for behavior disorder, with approximately 50% becoming clinical cases. To account for this pattern of differential risk, the NYLS investigators advanced the concept of "goodness of fit" which occurs when the attributes and capacities of the individual are in accord with the demands and expectations of the environment. Such consonance between the characteristics of the individual and environmental expectations potentiates optimal positive development, whereas dissonance between individual attributes and environmental expectations increases the likelihood of maladaptive functioning and distorted development (Chess and Thomas 1984; Thomas et al. 1968).

Conclusions

It has been somewhat more than half a century since Alexander Thomas and Stella Chess first sought to examine what it was that children might bring to their own development. In the years since the initiation of the NYLS temperament, researchers have been focused on how to define temperament and to specify and measure the developmental course of its dimensions. Clinically, Chess and Thomas have called attention to relations between temperamental attributes – most particularly those of the *difficult* child – and the emergence of behavioral disturbance. The concept of "goodness of fit" has also been used to provide an organizing framework for parental guidance, as a treatment modality for childhood behavior disorders and as part of preventative efforts in such high-risk populations as low birth weight infants and babies of teen-aged mothers. The focus of investigations of relations between temperament and psychopathology is currently expanding to include a focus on the neural circuitry underlying different temperamental dimensions to further illuminate their contributions to the etiology, pathogenesis, and treatment of

behavioral and emotional disorders as they present in children and adolescents (Hertzig 2012).

References

Chess, S., & Thomas, A. (1984). *Origins and evolution of behavior disorders from infancy to early adulthood*. New York: Brunner/Mazel.

Chess, S., & Thomas, A. (1990). Continuities and discontinuities in temperament. In L. D. Robins & M. Rutter (Eds.), *Straight and devious pathways from childhood to adulthood* (pp. 205–220). Cambridge, MA: Cambridge University Press.

Gesell, A. (1942). *Infant and child in the culture of today.* New York: Harper & Brothers.

Hertzig, M. E. (2012). Temperament then and now. *The Journal of Nervous and Mental Disease, 200*, 659–663.

Thomas, A., & Chess, S. (1977). *Temperament and development* (p. 161). New York: Brunner-Mazel.

Thomas, A., & Chess, S. (1982). Temperament and follow-up to adulthood. In R. Porter & G. M. Colli (Eds.), *Temperamental differences in infants and young children* (pp. 168–175). London: Pitman Books Ltd (Ciba Foundation symposium 89).

Thomas, A., & Chess, S. (1984). Genesis and evolution of behavioral disorders: From infancy to early adult life. *The American Journal of Psychiatry, 133*, 539–542.

Thomas, A., Chess, S., Birch, H. G., & Hertzig, M. E. (1960). A longitudinal study of primary reaction patterns in children. *Comprehensive Psychiatry, 1*, 103–112.

Thomas, A., Chess, S., & Birch, H. G. (1968). *Temperament and behavior disorders in children*. New York: New York University Press.

Thomas, A., Chess, S., Birch, H. G., Hertzig, M. E., & Korn, S. (1963) *Behavioral Individuality in Early Childhood*. New York: New York University Press.

Newcastle Personality Assessor (NPA)

Daniel Nettle
Centre for Behaviour and Evolution and Institute of Neuroscience, Newcastle University, Newcastle, UK

Definition

The Newcastle Personality Assessor (NPA) is a very brief (12-item), freely-available questionnaire for assessing the five-factor personality domains of openness, conscientiousness, extraversion, agreeableness, and neuroticism, using a five-point Likert response format. It was originally published in a book by Daniel Nettle (Nettle 2007).

Introduction

The Newcastle Personality Assessor is one of a number of similar very brief assessment tools for the five-factor model of personality (Gosling et al. 2003; Rammstedt and John 2007). These have been shown to capture much of the variation at the broad trait-level captured by longer questionnaires, using only a couple of items per trait, thus vastly reducing demand on participants. It follows from standard psychometric principles that construction of a useful but very brief inventory ought to be possible. In longer questionnaires, all of the questions measuring a particular trait are required to produce responses that are well correlated to one another (this is what is indicated by a high value of Cronbach's α, the conventional test of scale reliability). Thus, by choosing the one or two items with the highest average correlation to all the others, one captures most of the variation captured by the full scale.

The NPA is intended to be used in general adult samples. The items focus on behaviors and thoughts characteristic of high and low scorers on each of the five personality domains. Participants are instructed: "There follow some descriptions of behaviours and thoughts. Rate the extent to which they are usually characteristic of you." Responses are given on a five-point scale of very uncharacteristic, moderately uncharacteristic, neither uncharacteristic nor characteristic, moderately characteristic, and very characteristic. Scores for each domain are the sum of the individual items.

Validity and Reliability

In a community sample of 563 adults (mean age 34.87 years, standard deviation 13.17 years), the NPA-derived scores were shown to have high correlations with scores from a standard 50-item five-factor personality questionnaire (Goldberg et al. 2006). The correlations were openness 0.74,

conscientiousness 0.77, extraversion 0.77, agreeableness 0.77, and neuroticism 0.82 (Nettle 2007).

Questionnaire

	Item	Domain	
1	Starting a conversation with a stranger	Extraversion	
2	Making sure others are comfortable and happy	Agreeableness	
3	Creating an artwork, piece of writing, or piece of music	Openness	
4	Preparing for things well in advance	Conscientiousness	
5	Feeling blue or depressed	Neuroticism	
6	Planning parties or social events	Extraversion	
7	Insulting people	Agreeableness	Reverse scored
8	Thinking about philosophical or spiritual questions	Openness	
9	Letting things get into a mess	Conscientiousness	Reverse scored
10	Feeling stressed or worried	Neuroticism	
11	Using difficult words	Openness	
12	Sympathizing with others' feelings	Agreeableness	

Conclusion

The NPA has the advantage of providing a very brief, freely-available method of measuring the five-factor personality domains.

Cross-References

- ▶ Big Five Inventory
- ▶ Big-Five Model
- ▶ Nettle, Daniel

References

Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. G. (2006). The international personality item pool and the future of public-domain personality measures. *Journal of Research in Personality, 40*(1), 84–96. https://doi.org/10.1016/j.jrp.2005.08.007.

Gosling, S. D., Rentfrow, P. J., & Swann, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality, 37*(6), 504–528. https://doi.org/10.1016/S0092-6566(03)00046-1.

Nettle, D. (2007). *Personality: What makes you the way you are*. Oxford: Oxford University Press.

Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality, 41*(1), 203–212. https://doi.org/10.1016/j.jrp.2006.02.001.

Nezlek, John B.

John B. Nezlek
College of William & Mary, Williamsburg, VA, USA
SWPS University of Social Sciences and Humanities, Poznań, Poland

John B. Nezlek is a faculty member at The College of William & Mary in Williamsburg, Virginia (USA) and at the SWPS University of Social Sciences and Humanities in Poznań, Poland. He is a social-personality psychologist whose primary research is daily experience, broadly defined.

Early Life and Educational Background

Nezlek was born on January 12, 1952 on Staten Island, NY. At the age of 11, his family moved to Oceanside, NY, and he graduated from Oceanside High School in 1969. Following this he attended Duke University and earned an AB in Psychology and Sociology in 1973. He was introduced to psychology by Jack Brehm, from whom Nezlek took a freshman seminar on attitude change and social influence. Brehm became Nezlek's advisor

and supervised his honors thesis, which was later published in the Journal of Personality. Also of note, Camille Wortman was the teaching assistant for the methods course Nezlek took with Brehm, and Nezlek took classes from Kurt Back and James House in the sociology department. Following Duke, Nezlek attended the University of Rochester and received his MA and PhD in December of 1978. While at Rochester, Nezlek worked primarily with Ladd Wheeler, with whom he developed the Rochester Interaction Record (RIR), a technique that became (and remains) a standard method of studying daily social interaction (Wheeler & Nezlek, 1977). In the middle of Nezlek's time at Rochester, Harry Reis joined Wheeler and Nezlek and helped to develop the RIR further. While at Rochester, Nezlek's thinking was also influenced by Miron Zukerman and Edward Deci. Deci's work on intrinsic motivation (and later self-determination theory) was a particularly important influence on Nezlek's views of personality. Nezlek was also influenced by Alfred L. Baldwin who was on Nezlek's dissertation committee.

Professional Career

With the exception of a few years, Nezlek has spent his academic career at the College of William & Mary. He was hired as a visiting assistant professor in the fall of 1977, was tenured in 1985, and was promoted to professor in 1994. He accepted a position at SWPS University in Poland in 2012, and in 2015 he received his doctor of habilitation from SWPS University. He spent a year as a visiting professor at Purdue in 1980, a year in Leuven, Belgium as a visiting scholar (2005), and a year in Poland as a Fulbright Fellow (2013). Nezlek has also had short-term fellowships in Belgium, France, and Germany. He has authored more than 100 publications and chapters that have appeared in publications such as the *Journal of Personality*, *Journal of Personality and Social Psychology*, *Personality and Social Psychology Bulletin*, *Personality and Individual Differences*, and the *Journal of Cross-Cultural Psychology*. In addition, he has written two books: one concerning the application of multilevel models in social and personality (Nezlek, 2011) and another concerning diary methods in personality and social psychology (Nezlek, 2012).

Research Interests

Nezlek's primary research interest concerns individual differences in naturally occurring experience. This research has taken two general forms: studies of social interaction using the Rochester Interaction Record, and studies of daily experience, typically using end-of-day reports. The studies of social interaction have concerned social contact per se (what happens when people are together, e.g., Nezlek, Schütz, Schröder-Abé, & Smith, 2011), whereas the studies of daily experience have a broader focus and have concerned how and why people change from day to day (e.g., Nezlek & Gable, 2001). By examining how people vary across situations, studies of both types are meant to complement "traditional" trait-focused models that have emphasized consistency across situations.

In addition to an emphasis on within-person variability, studies of both types emphasize the need for precision when conceptualizing and measuring constructs and when analyzing the data collected in a study. The studies of social interaction have focused on various topics ranging from relationships between physical attractiveness and interaction to relationships between interaction and psychological well-being. Although the specific conclusions of these studies vary as a function of the focus of the study, one general conclusion is that quantity of social interaction (e.g., how many social interactions a person has each day) needs to be distinguished from the quality of social interaction (e.g., how enjoyable a person's interactions are). For example, it appears that depressive symptoms are relatively unrelated to how socially active someone is, but they are negatively related to the quality of someone's interactions (e.g., Nezlek, Hampton, & Shean, 2000). Similarly, the focus of his research on daily experience has varied considerably from study to study, but there is also a theme that emerges from this research taken together. When

studying daily experience and how people change day to day, Nezlek has established that it is important to distinguish the types of experiences people have (e.g., work vs. social), the types of reactions to these experiences being studied (e.g., affective vs. more cognitively focused measures, e.g., Nezlek, 2005), and the broader context within which people live (e.g., different cultures e.g., Nezlek, Sorrentino, Yasunaga, Otsubo, Allen, Kouhara, & Shuper, 2008).

An overarching concern of Nezlek's scholarship has been the methods used to measure daily experience and the analyses of these data. In addition to his pioneering work on the Rochester Interaction Record, he was also among the first researchers to use online data collection. Perhaps more important has been his work on the application of multilevel modeling to analyzing data collected in studies of daily experience (e.g., Nezlek, 2007). In addition to writing numerous papers and chapters (and the aforementioned books) about using multilevel modeling, he has offered over 30 workshops (across the world) on multilevel modeling analyses.

References

Nezlek, J. B. (2001). Multilevel random coefficient analyses of event and interval contingent data in social and personality psychology research. *Personality and Social Psychology Bulletin, 27*, 771–785. https://doi.org/10.1177/0146167201277001.

Nezlek, J. B. (2005). Distinguishing affective and non-affective reactions to daily events. *Journal of Personality, 73*, 1539–1568. https://doi.org/10.1111/j.1467-6494.2005.00358.x.

Nezlek, J. B. (2007). A multilevel framework for understanding relationships among traits, states, situations, and behaviors. *European Journal of Personality, 21*, 789–810. https://doi.org/10.1002/per.640.

Nezlek, J. B. (2011). Multilevel modeling for social and personality psychology. In J. B. Nezlek (Ed.), *The SAGE Library in social and personality psychology methods*. London: Sage Publications.

Nezlek, J. B. (2012). Diary methods for social and personality psychology. In J. B. Nezlek (Ed.), *The SAGE Library in social and personality psychology methods*. London: Sage Publications.

Nezlek, J. B., & Gable, S. L. (2001). Depression as a moderator of relationships between positive daily events and day-to-day psychological adjustment. *Personality and Social Psychology Bulletin, 27*, 1692–1704.

Nezlek, J. B., Hampton, C. A., & Shean, G. D. (2000). Clinical depression and everyday social interaction in a community sample. *Journal of Abnormal Psychology, 109*, 11–19.

Nezlek, J. B., Sorrentino, R. M., Yasunaga, S., Otsubo, Y., Allen, M., Kouhara, S., & Shuper, P. (2008). Cross-cultural differences in reactions to daily events as indicators of cross-cultural differences in self-construction and affect. *Journal of Cross-Cultural Psychology, 39*, 685–702. https://doi.org/10.1177/0022022108323785.

Nezlek, J. B., Schütz, A., Schröder-Abé, M., & Smith, C. V. (2011). A cross-cultural study of relationships between daily social interaction and the Five Factor Model of personality. *Journal of Personality, 79*, 811–840.

Wheeler, L., & Nezlek, J. (1977). Sex differences in social participation. *Journal of Personality and Social Psychology, 35*, 742–754.

NFC

▶ Need for Closure Scale

NFCC

▶ Need for Closure Scale

NGRI

▶ M'Naghten Rule

Niche

Karola Stotz[1] and Darcia Narvaez[2]
[1]Department of Philosophy, Macquarie University, Sydney, NSW, Australia
[2]Department of Psychology, University of Notre Dame, Notre Dame, IN, USA

Synonyms

Ecological niche

Definition

The *niche* refers to the ecological role of an organism in, and its relationship to, its ecosystem.

Introduction

Organisms can exploit a variety of niches that in turn exert selection pressure on the population and hence explain adaptive genetic variation between members of the population. Recent discussions within evolutionary theory have invoked two quite distinct concepts of the niche. Niche construction theory (NCT) and developmental niche construction (DNC) are both theories designed to put the active organism back at the center of evolutionary theory, albeit with different conception of the niche at their center.

Theories of Niche Construction

NCT refers to the process by which an organism alters its own environment and hence influences its own and its species selection pressure. It suggests that rather than populations of organisms passively adapting to a changing environment, they actively construct their environment – their *selective niche* – and thereby change the dynamics of evolution. Niche construction shapes the selection pressure of the population and can result in the ecological inheritance of its selective niche; both of these processes affect the fitness of future generations (Odling-Smee et al. 2003).

Some recent work on human evolution has emphasized the role of ecological niche construction in human evolution: the evolution of the unique characteristics of human psychology and social structure has been substantially driven by the selection pressures created by earlier psychological and social structures (Laland et al. 2000; Sterelny 2003). Niche construction theory deals with the *selective* niche, defined by the parameters that determine the relative fitness of competing types in a population. The ecological niche of humans overlaps mostly with its cultural niche that features in models of gene-culture coevolution, with genetic and cultural inheritance involved in a complex feedback loop via natural selection.

A quite different aspect of niche construction refers to the dependency of development on a rich *developmental niche*, which is actively constructed by the parents in interaction with the offspring, and other conspecifics. It may involve the physical and biological environment, and cognitive artifacts from tools to languages. Just like the construction of the selective niche, the developmental niche plays an important role in (human) evolution: The environment not just *selects for*, it also *constructs* new heritable variation. The developmental niche is defined by the parameters needed to ensure the reconstruction of the evolved life cycle.

The developmental niche figures dominantly in developmental system theory (DST), another account of evolution that focuses on the active role of the organism. At the center of DST lies the life cycle of a developmental system, which is comprised of the organism and its relationship to its developmental environment, the developmental niche. While most accounts of human nature focus mainly on the genetic heritage, a DS account of human nature pays attention to the role of the legacy of our developmental environment in constituting human nature (Stotz and Griffiths 2017). There is an old saying within anthropology that culture is not only part of human nature but that our nature is culture. The concept of the developmental niche is designed to integrate and formalize the nongenetic yet heritable factors influencing an organism's development. It is therefore the *evolved* developmental niche that provides channels of sustenance for the developing organism, such as nutrients, warmth, insulation, and behavioral and social stimuli. It "nurtures" the offspring in the form of resources, stimulation, and affordances for development, i.e., it gates what is available to be learned. Hence the evolved developmental niche defines several pathways by which effects of experience on the parental generation can be transmitted to later generations (Stotz 2014, 2017; Narvaez et al. 2013a, b).

The concept goes back to the "ontogenetic niche" coined by developmental psychobiologists

West and King (1987). In the current formulation of the concept (Stotz 2014, 2017; Stotz and Griffiths 2017), the developmental system consists of genetic and epigenetic resources and an exogenetic developmental niche, which contains reliably inherited physical, social, ecological, and epistemic resources needed to reconstruct, or in the case of phenotypic plasticity to modify, that developmental system. These resources can be actively constructed by the parents (producing the "parental effects" of quantitative genetics) or by the larger group, co-constructed by parent and offspring, or sourced passively from a stable environment. Wherever they come from, if there exists an evolutionary explanation for the interaction of the evolved developmental system with the resource then that resource is part of the system. What evolves by natural selection is a relationship between system and each resource.

The Developmental Niche and Human Development

How does the developmental niche influence human development? Human babies are needy. They are born early in comparison to other primates, meaning that for several months postnatally, relative to other primates, human babies share characteristics of fetuses rather than of infants in those other primates (Trevathan 2011). Comparing brain size at birth among primates, humans should be born at 18 months of age. A large part of brain development takes place outside the uterus, influencing human offspring epi- and exogenetically much more postnatally than their ape cousins, which makes the early niche fundamental for human development. Over the course of human evolution, as brains became bigger and human infants more immature at birth, human child-rearing practices evolved in tandem with these changes to ensure the survival of the helpless infant. As bipedalism, hemochorial placenta, large brains, and the need for a great amount of learning after birth emerged, human evolution intensified parental care. The latter were important preconditions for selection to favor the evolution of a large brain in a bipedal animal (Trevathan 2011). The evolution of a more complex and resource-demanding developmental niche has been a key feature of human evolution.

For this reason, it seems to us entirely natural to say that that human nature resides partly in the human developmental environment. We are a species that is particularly strongly influenced by niche construction, both selective niche construction over evolutionary timescales and developmental niche construction over ontogenetic timescales. A concept of nature according to which what is natural must come from the inside is particularly unsuitable for such a species. Imagine trying to determine the real nature of an ant, another powerful niche constructor, by removing the influence of the nest on the developing egg and embryo. The result would be either dead or biologically meaningless, and so it is for humans. The concern is that when the developmental niche is not provided, the offspring will not develop in a species-typical manner.

As social mammals, humans have an intensive developmental niche for their young – soothing perinatal experience; warm responsive care; nearly constant physical touch (carrying, co-sleeping); years of breastfeeding, free play in the natural world (Konner 2005). The human developmental niche became more intensive because of the immaturity of the neonate, adding to the social mammalian practices a positive climate of mother-dyad support and multiple adult caregivers (Hrdy 2009). All these practices have known epigenetic and plasticity effects on neurobiological systems and long-term well-being of the child (for reviews see: Narvaez et al. 2013b). The developmental niche has powerful effects on the type of human nature one develops, as notable among societies who routinely provide it – small-band hunter-gatherers (e.g., Ingold 2005), the type of society in which the human genus spent 99% of its genus history. Recent empirical studies also show the developmental niche's relation to adult mental health, sociality, and morality (Narvaez et al. 2013b).

The developmental niche has two fundamental functions. One function is to ensure the stable, reliable development of species-typical traits. So what explains *Typicality* is the developmental systems dynamics within what we may call "normal"

parameters, some of which are provided by pre-existing physical and developmental constraints. The rest are ensured by reliably and stably inherited resources, which are not just the genome but essential environmental resources that assist, among other functions, in the species-typical expression of the genetic factors. These stable resources are also what partially explain fixity. In addition there are buffering internal mechanisms of the organism that buffer against internal (genetic, epigenetic, metabolic) and external perturbations. These are invoked when we talk about canalization.

But human nature needs to embrace and explain human diversity: Here the second function of the developmental niche comes in. Beyond ensuring reliable, species-typical development, the developmental niche also provides input to developmental plasticity. Plasticity is often defined in terms of a genotype's ability to produce different phenotypes in response to the environment. It would be more accurate, however, to say that the shape of the norm of reaction is a property of the whole developmental system. So what explains human diversity are differing developmental systems dynamics supported by modifications in the developmental niche. In other words, human diversity results primarily from the interaction between the evolved developmental system and a wide range of environments, including novel environments. We should find order by identifying underlying patterns of similarity and difference rather than universal elements (Griffiths 2011). Developmental niche construction therefore provides dependability, but also adaptive flexibility, in the provision of necessary developmental resources.

Cross-References

► Environment of Evolutionary Adaptedness (EEA)

References

Griffiths, P. E. (2011). Our plastic nature. In S. Gissis & E. Jablonka (Eds.), *Transformations of Lamarckism: From subtle fluids to molecular biology* (pp. 319–330). Cambridge, MA: MIT Press.

Hrdy, S. (2009). *Mothers and others: The evolutionary origins of mutual understanding*. Cambridge, MA: Belknap Press.

Ingold, T. (2005). On the social relations of the hunter-gatherer band. In R. B. Lee & R. Daly (Eds.), *The Cambridge encyclopedia of hunters and gatherers* (pp. 399–410). New York: Cambridge University Press.

Konner, M. (2005). Hunter-gatherer infancy and childhood: The !Kung and others. In B. Hewlett & M. Lamb (Eds.), *Hunter-gatherer childhoods: Evolutionary, developmental and cultural perspectives* (pp. 19–64). Transaction: New Brunswich, NJ.

Laland, K. N., Odling-Smee, F. J., & Feldman, M. W. (2000). Niche construction, biological evolution and cultural change. *Behavioral and Brain Sciences, 23*, 131–157.

Narvaez, D., Gleason, T., Wang, L., Brooks, J., Burke Lefever, J., Cheng, Y., & the Center for the Prevention of Child Neglect. (2013a). The evolved development niche: Longitudinal effects of caregiving practices on early childhood psychosocial development. *Early Childhood Research Quarterly, 28*, 759–773.

Narvaez, D., Panksepp, J., Schore, A., & Gleason, T. (Eds.). (2013b). *Evolution, early experience and human development: From research to practice and policy*. New York: Oxford University Press.

Odling-Smee, F. J., Laland, K. N., & Feldman, M. W. (2003). *Niche construction: The neglected process in evolution*. Princeton: Princeton University.

Sterelny, K. (2003). *Thought in a hostile world: The evolution of human cognition*. Oxford: Blackwell.

Stotz, K. (2014). Extended evolutionary psychology: The importance of transgenerational developmental plasticity. *Frontiers in Psychology, 5*, 908. https://doi.org/10.3389/fpsyg.2014.00908.

Stotz, K. (2017). Why developmental niche construction is not selective niche construction – And why it matters. *Interface Focus, 7*, 20160157 (Special Issue "New Trends in Evolutionary Biology").

Stotz, K., & Griffiths, P. E. (2017). A developmental systems account of human nature. In E. Hannon & T. Lewens (Eds.), *Why we disagree about human nature*. Oxford: Oxford University Press.

Trevathan, W. (2011). *Human birth: An evolutionary perspective*. New York: Aldine de Gruyter.

West, M. J., & King, A. P. (1987). Settling nature and nurture into an ontogenetic niche. *Developmental Psychobiology, 20*(5), 549–562.

Nicotine

► UPPS Model of Impulsivity

Nightmare

► Dreams

Nomological Nets

Franzis Preckel[1] and Martin Brunner[2]
[1]Department of Psychology, Chair of Giftedness Research and Education, University of Trier, Trier, Germany
[2]Berlin-Brandenburg Institute for School Quality, Free University of Berlin, Berlin, Germany

Introduction

The term "nomological net" has been coined in the seminal paper by Cronbach and Meehl (1955) on construct validity (see also American Psychological Association 1954). Cronbach and Meehl introduced the idea of construct validity to validate theoretical attributes or qualities (i.e., constructs) for which there is no adequate criterion or which cannot be defined operationally, for example, personality traits or intelligence. The concept of construct validity as defined by Cronbach and Meehl did not only refer to *measures* of constructs, as did the earlier validity concepts of content validity or predictive validity, but intertwined the construct validation of measures with theory testing. According to construct validity theory, a construct is implicitly defined by its position in a network of other constructs that is deduced from theory and based on scientific laws – the "nomological net" (Cronbach and Meehl 1955). The laws in the nomological net or network (nomological: Greek for lawful) relate different constructs to each other (i.e., theoretical relations), at least some of these constructs to observations and the different observations to each other (i.e., empirical relations). In a nutshell, a nomological network can be understood as a system of scientific laws that relates constructs to each other and to observations. Campbell and Fiske (1959) extended construct validity theory by pointing out that theoretical as well as empirical relations should not only focus on convergent validity of related attributes but also on discriminant validity of unrelated attributes.

The Nomological Net Idea in Behavioral Science

The concept of the nomological network has been highly influential in research in the behavioral sciences and is still widely used. For example, a recent PsychINFO search in May 2016 revealed 655 journal articles published in the new millennium in the field of differential or personality psychology and assessment that apply the terms "nomological net" or "nomological network" (Search string: "nomological net" OR "nomological network" AND "personality differences" OR "individual differences" OR "differential psychology" OR "measurement" OR "assessment" OR "diagnosis" OR "testing" OR "psychometrics"). Most of these publications, however, are not concerned with the concept of the nomological network per se but rather use this term to frame their research (e.g., "investigation of the nomological network of construct x"). Scientific research and debates on the concept of the nomological network as such have typically been motivated to clarify the concept of construct validity and the practice of construct validation.

If constructs are defined by their position in a nomological net, the availability of such a lawful network of relations deduced from theory is a precondition for construct validation of measures and theories. Psychological theories often lack this theoretical precision. This has led to a dissociation between construct validity qua theory and the practice of construct validation (Brennan 2013), a weakening of the theory testing part of construct validity (Colliver et al. 2012), and a renewed discussion of the concept of validity as such (Borsboom et al. 2004; Embretson 2007; Newton and Shaw 2013; Special Issue on Validity of the *Journal of Educational Measurement*, 2013, 50/1).

Nomological Nets and Construct Validation

The nomological network idea provides no framework for addressing practical validation issues. Nevertheless, it helps to refine the construct validation process. Specifically, Cronbach (1988) contrasted programs of strong and weak construct validation. Strong programs are based on fully developed formal theories (i.e., nomological nets) and deductive theory testing, while weak programs are based on less developed theories that – put to the extreme – would allow interpreting any relation as validation evidence ("anything goes"). Strong and weak programs combine in construct validation in "an iterative process in which tests of partially developed theories provide information that leads to theory refinement and elaboration, which in turn provides a sounder basis for subsequent construct and theory validation research" (Strauss and Smith 2009, p. 9; see already Cronbach and Meehl 1955, for a discussion of these top-down and bottom-up processes in construct validation). In doing so, construct validation becomes an open-ended process in which validity is an overall evaluative judgment of the degree to which theoretical arguments and empirical findings support the plausibility and appropriateness of interpretations and uses of test scores (Messick 1995). Kane (2001, 2013) offered a pragmatic argument-based approach to construct validation that should avoid the extremes of the strong and weak program, thus, fitting better to actual research practice. In the argument-based approach, construct validity is established through theoretical and empirical evidence for a specific and clearly proposed use or interpretation of a measure instead of rigorous theory or nomological network testing (cf. Kane 2013).

In construct validation studies, convergent and discriminant relations are typically reported as correlations; researchers rarely refer to logical arguments or experimental results. Correlations can be estimated within a latent variable framework, e.g., by confirmatory factor analysis or structural equation modeling. When using such confirmatory methods, the nomological network idea guides psychological research in differential and personality psychology by pinpointing the importance of theory in the formulation of hypotheses about convergent and discriminant construct relations, by linking constructs to observations, by distinguishing between latent relations and observed relations, by distinguishing between conceptual and empirical overlap, or by distinguishing between theoretically and operationally defined constructs. There are various tools available to visually display network relations (e.g., Epskamp et al. 2012), as well as methods to evaluate construct validity based on convergent and discriminant construct relations (Westen and Rosenthal 2003).

Challenges

However, despite more than 50 years of research on nomological nets and construct validity, many open questions regarding theory and application of the nomological network idea remain:

First, convergent validity arguments are frequently based on correlations. High correlations of two or more measures of the same construct are interpreted in support of the convergent validity of a measure. However, no consensus has yet been reached on what constitutes a high enough correlation or how to deal with inconsistent correlational findings. Correlations are also influenced by the psychometric properties of a measure, the sample, or the method of assessment (e.g., tests, self-report). Further, for construct validation, there is the need to differentiate between the level of observations and the level of constructs. These aspects are not consistently taken into account in current validation studies (Schweizer 2012). Taken together, these issues undermine the idea of convergent validity as a vague and somewhat indetermined concept (Schweizer 2012).

Second, when measures of different constructs are not meaningfully correlated, this is typically

interpreted as supporting the discriminant validity of these measures. However, many validation studies lack a clear theoretical rationale for selecting constructs for discriminant relations (Ziegler et al. 2013). Frequently, theoretically unrelated constructs are chosen. However, to strongly support the construct validity of measures of (new) constructs, it is most informative to investigate relations between different but closely related constructs (Shaffer et al. 2015; Ziegler et al. 2013). And again, there is the need to differentiate between the level of observations and the level of constructs (see Shaffer et al. 2015, for a guideline for conducting a discriminant validation study that takes these aspects into account).

Third, the nomological net relates theoretical constructs to observations assessed with a certain method. Methods refer to key factors that define the measurement process. That is, so-called method factors (e.g., rater response styles, characteristics of the item wording, high- vs. low-stakes measurement contexts) may introduce systematic variance over and above variance attributable to the target construct. Method factors may threaten the construct validity of a measure, particularly, because method variance has been estimated to make up between 18 and 32 percent of the total item variance (Podsakoff et al. 2012). Further, the nature of method variance remains elusive as theories explaining the phenomena producing method variance are scarce (Ziegler et al. 2013). Podsakoff et al. (2012) present an overview of procedural and statistical approaches that may help to minimize the impact of method variance.

Fourth, Embretson (1983) differentiates two components of construct validity: nomothetic span and construct representation. While nomothetic span comprises convergent and discriminant relations of a measure, construct representation refers to a cognitive theory that explains response behavior for that measure. Nomological nets include laws that relate constructs to observations, that is, construct representation; however, most studies that use the nomological network idea focus on convergent and discriminant relations or nomothetic span and neglect construct representation. But if we lack a theory of response behavior, that is, if we cannot explain our data, an important precondition for interpreting nomothetic span is missing. Borsboom et al. (2004) therefore argue for a shift to an attribute-based view of measurement that assigns validity to a measure only if theoretical and empirical arguments support the assumption that an attribute causes the measurement outcomes. In this respect, rational or theory-based item and test construction as well as scaling and scoring of test behavior become of paramount importance (Brennan 2013).

Conclusion

The idea of the nomological net was introduced to guide construct validation. To this end, the network in its strong form specifies the laws that explain to what extent and why theoretical constructs are related with each other and with corresponding measures. In its strong form, the network also informs on the circumstances (i.e., moderator variables) when these relations can or cannot be observed. Given its iterative nature, the nomological network idea underscores that theory development hinges on both clear construct definitions (see Podsakoff et al. 2016, for guidelines) and the development of excellent measures.

References

American Psychological Association. (1954). Technical recommendations for psychological tests and diagnostic techniques. *Psychological Bulletin, 51*(2, Suppl.).

Borsboom, D., Mellenbergh, G. J., & van Heerden, J. (2004). The concept of validity. *Psychological Review, 111*, 1061–1071. https://doi.org/10.1037/0033-295X.111.4.1061.

Brennan, L. R. (2013). Commentary on "Validating the Interpretations and Uses of Test Scores". *Journal of Educational Measurement (Special Issue: Validity), 50*, 74–83. https://doi.org/10.1111/jedm.12001.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56*, 81–105. https://doi.org/10.1037/h0046016.

Colliver, J. A., Conlee, M. J., & Verhulst, S. J. (2012). From test validity to construct validity . . . and back? *Medical Education in Review, 46*, 366–371. https://doi.org/10.1111/j.1365-2923.2011.04194.x.

Cronbach, L. J. (1988). Five perspectives on the validity argument. In H. Wainer & H. I. Braun (Eds.), *Test validity* (pp. 3–17). Hillsdale: Erlbaum.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, *52*, 281–302. https://doi.org/10.1037/h0040957.

Embretson, S. E. (1983). Construct validity: Construct representation versus nomothetic span. *Psychological Bulletin, 93*(1), 179–197.

Embretson, S. E. (2007). Construct validity: A universal validity system or just another test evaluation procedure? *Educational Researcher, 36*, 449–455. https://doi.org/10.3102/0013189X07311600.

Epskamp, S., Cramer, A. O. J., Waldorp, L. J., Schmittmann, V. D., & Borsboom, D. (2012). qgraph: Network visualizations of relationships in psychometric data. *Journal of Statistical Software, 48*, 1–18. https://doi.org/10.18637/jss.v048.i04.

Kane, M. (2001). Current concerns in validity theory. *Journal of Educational Measurement, 38*, 319–342. https://doi.org/10.1111/j.1745-3984.2001.tb01130.x.

Kane, M. (2013). Validating the interpretations and uses of test scores. *Journal of Educational Measurement, 50*, 1–73. https://doi.org/10.1111/jedm.12000.

Messick, S. (1995). Validity of psychological assessment: Validation of inferences from persons' responses and performances as scientific inquiry into score meaning. *American Psychologist, 50*, 741–749. https://doi.org/10.1037/0003-066X.50.9.741.

Newton, P. E., & Shaw, S. D. (2013). Standards for talking and thinking about validity. *Psychological Methods, 18*, 301–319. https://doi.org/10.1037/a0032969.

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 65*, 539–569. https://doi.org/10.1146/annurev-psych-120710-100452.

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2016). Recommendations for creating better concept definitions in the organizational, behavioral, and social sciences. *Organizational Research Methods*. https://doi.org/10.1177/1094428115624965. Published online before print.

Schweizer, K. (2012). On issues on validity and especially on the misery of convergent validity. *European Journal of Psychological Assessment, 28*, 249–254. https://doi.org/10.1027/1015-5759/a000156.

Shaffer, J. A., DeGeest, D., & Li, A. (2015). Tackling the problem of construct proliferation: A guide to assessing the discriminant validity of conceptually related constructs. *Organizational Research Methods*. https://doi.org/10.1177/1094428115598239. Published online before print.

Strauss, M. E., & Smith, G. T. (2009). Construct validity: advances in theory and methodology. *Annual Review of Clinical Psychology, 5*, 1–25. https://doi.org/10.1146/annurev.clinpsy.032408.153639.

Westen, D., & Rosenthal, R. (2003). Quantifying construct validity: Two simple measures. *Journal of Personality and Social Psychology, 84*, 608–618. https://doi.org/10.1037/0022-3514.84.3.608.

Ziegler, M., Booth, T., & Bensch, D. (2013). Getting entangled in the nomological net. *European Journal of Psychological Assessment, 29*, 157–161. https://doi.org/10.1027/1015-5759/a000173.

Nomothetic Study of Personality

Khairul Anwar Mastor
Universiti Kebangsaan Malaysia,
Bangi, Malaysia

Synonyms

Cross-cultural approach; Trait approach

Definitions

Nomothetic is derived from a Greek word "nomos" or law or general law. Thus, nomothetic study of personality is an approach to establish general principles or law about human personal attributes and characteristics which, through many and acceptable research work, lead to the formation of a theory.

Introduction

During early period of studies on human personality, the focus was on understanding the nature and characteristics of people – with the assumption that people seem to possess personality basic templates or traits that are common, shared, and universal among different cultures globally. Nomothetic approach was introduced by Allport in 1937 to identify general pattern of personality across different groups of individuals. The approach is more of quantitative in nature because

in order to explore universal law of personality, the method should be valid, reliable, and replicable. Statistics were used as the major analytical tool where significant results become the acceptable and valid evidence of generalization of specific aspects of personality and individual differences among groups of persons (Kline 2013). Correlational and experimental studies are among designs of study that are nomothetic in nature.

Along, but different, with nomothetic is idiographic approach. It opposes to the notion that human personality is universal and shared human properties. Instead, idiographic approach posits that humans are special individuals and possess specific personality templates and characteristics that are culture specific (Kenrick and Braver 1982). Case study design is among methods adopting the idiographic approach. This section, however, focuses on the nomothetic approach in personality.

Characteristics of Nomothetic Approach

A basic and fundamental aspect of nomothetic approach is that it is a between-person-centered analysis, not within-person which is more of idiographic approach (Grice 2007). It means that the information about the personality of individuals are generated from the accumulation of data and systematic analysis of aggregate statistics. Common tools in nomothetic research work are instruments or questionnaires that are tested to be valid and reliable prior to the administration of the instruments. These instruments are administered among the targeted samples, and the data, treated as a group data, are then subjected to the statistical analyses.

In normal practices, one important assumption for the analyses is the normality of data distribution. If the data is normally distributed, the parametric analytical approach would be employed. In contrast, the nonparametric analyses would be used for data not normally distributed. In either both approaches, the findings are generally based on the aggregate analyses across individuals – such as computing means, standard deviations, correlation, factor analysis, regression and other analyses. Lexical studies is one example of nomothetic research in which scores of adjective terms are aggregated and subjected to further analyses like exploratory and confirmatory factor analyses. The number of the extracted factors is the targeted findings to be generalized and become the "law" of universal structure of personality traits across cultures. Lexical approach has been widely used in studying diverse cultures. Recent development in methods in personality psychology indicates the focus has gradually been shifted from between-individual to within-individual analyses (Beltz et al. 2016). New advances in analytical research tool such as multilevel modelling or hierarchical linear modelling analyses has been used to study intraindividual or within-person individual structure and dynamics processes besides continuing the existing between-person analyses.

Application of Nomothetic Approach

Nomothetic approach has penetrated and has been applied in many aspects of personality research (Cone 1986). It allows theories to be tested through systematic empirical observation, and this helps psychology to develop. In this section, three aspects of personality are selected to describe the application of nomothetic approach: personality trait structure and dimensions, assessment of personality traits, and predictive function of personality traits.

Personality Trait Structure and Dimensions

Nomothetic approach has been used to study the underlying personality structure and dimensions among different cultures around the globe. Two major types of research methods are commonly used in investigating personality structures: etic and emic. Etic approach refers to the use of concept and constructs derived from the culture of its origin and then imposes upon the targeted local cultures. A clear example of etic-nomothetic approach is the cross-cultural study of Big Five or five-factor model of personality (FFM) or Big Six HEXACO as the universal dimensions of personality (McCrae and Costa 1996; Ashton et al. 2014).

In the cultural study of Big Five, items of the NEO PIR were translated into the targeted

language authorized and validated by the original authors of the instrument (Boudreaux 2016). Translation involved some modification of items to suit the targeted cultures. Exploratory factor analyses (EFA) were normally used to explore whether five factors were extracted. If five factors were retrievable and factor congruences were high in many cultures, then the existence of Big Five or FFM became stronger. In the Personality Profiles of Cultures (PPOC) project, both adult and adolescent studies supported the existence of Big Five factor of personality in more than 50 countries (McCrae and Terracciano 2005; Terracciano et al. 2005). This is based on generalization principle embedded in nomothetic approach.

Assessment of Personality

Nomothetic approach allows assessment of personality which involves measuring and assessing personality variations between individuals. Various psychometric methods are used to study the inter-individual variation such as mean scores comparison, personality profiling, group comparison, and other quantitative methods which are nomothetic in nature. Studies to compare gender, age, and cultural differences in personality traits have been widely conducted. Most of the studies use large number of samples so as to establish valid findings and generalization such as in the global studies on world views (Saucier et al. 2015). Such analyses are widely used in the analyses of personality reports, even though its assumption of homogeneity across people and time might be violated. On contrary, case studies, interviews, unstructured observation, and other qualitative methods are idiographic and person-specific in nature – not looking at culture-specific phenomenon. The idiographic approach focuses on an individual personality testing to conduct individual case studies and determine the scope of personality characteristics unique for each person (Weiner and Greene 2017).

Predictive Functions of Personality

Since personality traits normally considered as stable and enduring characteristics influence behavior, most studies conceptualized the personality traits as antecedents or independent variables. In other words, the nomothetic model attempts to find independent variables that account for the variations in a given phenomenon. Nomothetic assessments give evidence to the influence of individual personality on life experiences (Martin 2005; Roberts et al. 2007; Carducci 2009). Analysis of group similarity allows suggesting specific behavior patterns and reactions to different situations and social events. Using nomothetic findings, researchers not only suggest of behavior patterns but peculiar to particular personality traits, which allows predicting responses to various factors such as work productivity (Mount and Barrick 1998).

Limitation

Although nomothetic approach is indispensable in studying personality, generally, it has three limitations. First, since the nomothetic approach mainly uses statistical tools to infer generalization, using the whole-person perspective ignores the individual level of personality. Thus, prediction is about groups and not individuals. Second, some subjective experience may not be tapped using standardized instrument in order to comprehend the personality beyond the traits. McAdams (2015) proposed three levels of personality constructs – level of dispositional traits, characteristic adaptation, and life stories – which tell a comprehensive picture of human personality. Third, the possible existence of confounding variable in nomothetic approach – not all variable can be included in the research – thus lacks ecological validity. Studying human personality is not merely scientific, but cultural factors may somehow influence the way one think, feel, and act. However, the challenge in nomothetic approach is to develop items that capture dimensions of universality among people of different cultural background.

Conclusion

In nomothetic approach, the aim of researchers is to identify common, shared personality traits whether they are imported or indigenously explored in which generalization principle is

applied. Through research perspectives, however, both nomothetic and idiographic approaches are necessary, important, and mutually dependent in explaining the comprehensive, universal, and specific aspects of personality. The nomothetic approach is highly useful to create a general picture of personality characteristics in contrast to the idiographic specific group of people. Although nomothetic approach produces different school of thoughts on the personality structure and dimensions, it accumulates the body of knowledge about human nature. On the ground of the observed commonalities, nomothetic assessors formulate universal principles and rules for understanding personality. Though the nomothetic approach to personality assessment differs from the idiographic testing, they are typically used to complement one another. Indeed, each person is unique in terms of some traits and temperament, which make him or her distinct from the group. At the same time, each person shares a set of common personality characteristics and behavior styles as a member of the group (McKenna 2000).

Cross-References

- ▶ Idiographic Study of Personality
- ▶ Personality Assessment

References

Ashton, M. C., Lee, K., & de Vries, R. E. (2014). The HEXACO honesty-humility, agreeableness, and emotionality factors: A review of research and theory. *Personality and Social Psychology Review, 18*, 139–152.

Beltz, A. M., Wright, A. G. C., Sprague, B. N., & Molenaar, P. C. M. (2016). Bridging the nomothetic and idiographic approaches to the analysis of clinical data. *Assessment, 23*(4), 447–458. https://doi.org/10.1177/1073191116648209.

Boudreaux, M. J. (2016). Personality-related problems and the five-factor model of personality. *Personal Disorder, 7*(4), 372–383. https://doi.org/10.1037/per0000185.

Carducci, B. J. (2009). *The psychology of personality: Viewpoints, research and applications*. Hoboken: Wiley.

Cone, J. D. (1986). Idiographic, nomothetic, and related perspectives in behavioral assessment. In R. O. Nelson & S. C. Hayes (Eds.), *Conceptual foundations of behavioral assessment* (pp. 111–128). New York: Guilford Press.

Grice, J. W. (2007). Person-Centered structural analyses. In F. Robins & Krueger (Eds.), *Handbook of research methods in personality psychology* (pp. 557–572). New York: Guilford Press.

Kenrick, D. T., & Braver, S. L. (1982). Personality: Idiographic and nomothetic: A rejoinder. *Psychological Review, 89*(2), 182–186.

Kline, P. (2013). *Handbook of psychological testing*. New York: Routledge.

Martin, J. (2005). *Organisational behaviour and management*. London: Cengage Learning.

McAdams, D. P. (2015). *The art and science of personality development*. New York: Guilford Press.

McCrae, R. R., & Costa, P. T., Jr. (1996). Toward a new generation of personality theories: Theoretical contexts for the five-factor model. In J. S. Wiggins (Ed.), *The five-factor model of personality: Theoretical perspectives* (pp. 51–87). New York: Guilford Press.

McCrae, R. R., & Terracciano, A. (2005). Personality profiles of cultures: Aggregate personality traits. *Journal of Personality & Social Psychology, 89*(3), 407–425.

McCrae, R. R., Chan, W., Jussim, L., De Fruyt, F., Lockenhoff, C. E., De Bolle, M., Costa, P. T., Jr., Graf, S., Realo, A., Mastor, K. A., . . ., Terracciano, A. (2013). The inaccuracy of national character stereotypes. *Journal of Research in Personality, 47*(6), 831–842.

McKenna, E. F. (2000). *Business psychology and organisational behaviour: A student's handbook*. New York: Psychology Press.

Mount, M. K., & Barrick, M. R. (1998). Five reasons why the "big five" article has been frequently cited. *Personnel Psychology, 51*(4), 849–857. https://doi.org/10.1111/j.1744-6570.1998.tb00743.x.

Roberts, B., Kuncel, N., Shiner, R., Caspi, A., & Goldberg, L. (2007). The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives on Psychological Science, 2*(4), 313–345. https://doi.org/10.1111/j.1745-6916.2007.00047.x.

Saucier, G., Kenner, J., Iurino, K. M., Philippe, B., Chen, Z., Thalmayer, A. G., Kemmelmeier, M., Tov, W., Boutti, R., Metaferia, H., Cankaya, B., Mastor, K. A., Hsu, K. Y., Wu, R., & Maniruzzaman, M. (2015). Cross-cultural differences in a global survey of world views. *Journal of Cross-Cultural Psychology, 46*, 53–70.

Terracciano, A., Abdel-Khalek, A. M., Ádám, N., Adamovová, L., Ahn, C.-k., Ahn, H.-n., . . . McCrae, R. R. (2005). National character does not reflect mean personality trait levels in 49 cultures. Science, 310(5745), 96–100. https://doi.org/10.1126/science.1117199.

Weiner, I. B., & Greene, R. L. (2017). *Handbook of personality assessment* (2nd ed.). Hoboken: Wiley.

Nonaffective Constraint

Eric A. Fertuck[1] and Robert D. Melara[2]
[1]City College and Graduate Center, City University of New York, New York City, NY, USA
[2]The City College of New York (CCNY), City University of New York, New York City, NY, USA

Definition

Nonaffective constraint is a personality trait concerned with the modulation of activity in motor, emotional, and cognitive domains.

Introduction

Nonaffective constraint (NC) is a personality trait with roots in both neuroscience and personality research. Depue and Collins (1999) first conceptualized NC as a neuroregulatory system that modulates activity in motor, emotional, and cognitive domains. High levels of NC allows for greater levels of control over reactive behaviors, emotions, and cognitions (Depue and Lenzenweger 2015; Moore and Depue 2016). Rooted in a threshold model of behavioral reactivity, NC assumes a central neural contribution for such inhibition (see below). While there is no single neurobiological correlate for NC, self-report and neurocognitive tasks are well established in measuring NC at the behavioral level. Self-report instruments such as the *constraint scale* within the Multidimensional Personality Questionnaire (Tellegen 1982) assesses aspects of NC as well. Neurocognitive tasks such as the Go-No Go Task (Goldstein et al. 2007) and the Wisconsin Card Sorting Tasks (Heaton et al. 1993) represent performance-based measures of aspects of NC. The closest neighbor personality trait in the Five Factor Model to NA is Conscientiousness. However, Conscientiousness and NC have significant conceptual differences as well. Further, Conscientiousness is not rooted in basic neuroscience findings and includes elements of moral values and perfectionism not that are not central to NA.

Breakdowns in NA contribute to various forms of psychopathology, particularly through the trait of impulsivity, or, impaired NC (Eysenck and Eysenck 1977; Tellegen and Waller 1997). Attention Deficit Hyperactivity Disorder (Nigg 2001), substance use disorders (Jentsch and Taylor 1999), personality disorders (particularly borderline personality disorder) (Fertuck et al. 2005, 2006; Lenzenweger et al. 2004; Perez et al. 2016) and schizophrenia (Gut-Fayand et al. 2001) all exhibit impairments in NA in some form and degree. There is preliminary research indicating that effective treatment for borderline personality disorder is associated with improvement in NC at behavioral and neurofunctional levels (Perez et al. 2016). This increased NA was reflected in increased activity in prefrontal regions and decreased reactivity of fear processing regions (i.e., the amygdala) that occur in conjunction with symptom reduction.

Neurochemically, early animal models pointed to serotonergic pathways as possible neurochemical source of NC (Depue and Collins 1999), as serotonin depletion often triggers loss of behavioral inhibition (Spoont 1992). However, when NC is conceptualized as a more general inhibitory mechanism (Bari and Robbins 2013), recent evidence using the stop-signal task (which requires the withholding of prepotent responses) (Logan 1982, 1983) suggests that noradrenergic pathways predominate (Aston-Jones and Cohen 2005; Aston-Jones et al. 1999; Berridge and Waterhouse 2003; Sara 2009; Yu and Dayan 2005), especially for inhibition of behaviors already activated (Eagle et al. 2008; Robbins and Arnsten 2009), with only a minor contribution of the serotonergic system (Clark et al. 2005; Nandam et al. 2011; Overtoom et al. 2009). A recent suggestion (Aron 2011) divides NC into a reactive process that directly halts activated responses, perhaps noradrenergic through the involvement of the locus coeruleus and a proactive process that inhibits behaviors selectively, perhaps through the dopaminergic involvement of the striatum (Boehler et al. 2011).

Neuroanatomically, the executive management of NC is the purview of the prefrontal cortex (PFC). Here, a division of labor is evident, with motor inhibition controlled by the supplementary motor area (SMA) and pre-SMA (Aron and Poldrack 2006; Fried et al. 1991; Li et al. 2006), distractor and emotional inhibition controlled by the dorsolateral PFC (Delgado et al. 2008), and the monitoring of errors and conflict of competing responses by the anterior cingulate cortex (Botvinick et al. 2001; Holroyd and Coles 2002). Inhibitory control is seen as hierarchical, with PFC affecting a variety of cortical and subcortical brain regions through its projections to amygdala, hypothalamus, basal ganglia, premotor cortex, cingulate cortex, and posterior parietal cortex. Although originally conceived as a stable feature of the central nervous system, NC is amenable to neural plasticity, revealing long-lasting enhancements in inhibitory control following cognitive training interventions (Eldar and Bar-Haim 2010; Melara et al. 2002).

Cross-References

► Self-Regulation

References

Aron, A. R. (2011). From reactive to proactive and selective control: Developing a richer model for stopping inappropriate responses. *Biological Psychiatry, 69*(12), e55–e68. https://doi.org/10.1016/j.biopsych.2010.07.024.

Aron, A. R., & Poldrack, R. A. (2006). Cortical and subcortical contributions to stop signal response inhibition: Role of the subthalamic nucleus. *The Journal of Neuroscience, 26*(9), 2424–2433. https://doi.org/10.1523/JNEUROSCI.4682-05.2006.

Aston-Jones, G., & Cohen, J. D. (2005). An integrative theory of locus coeruleus-norepinephrine function: Adaptive gain and optimal performance. *Annual Review of Neuroscience, 28*(1), 403–450. https://doi.org/10.1146/annurev.neuro.28.061604.135709.

Aston-Jones, G., Rajkowski, J., & Cohen, J. (1999). Role of locus coeruleus in attention and behavioral flexibility. *Biological Psychiatry, 46*, 1309–1320.

Bari, A., & Robbins, T. W. (2013). Inhibition and impulsivity: Behavioral and neural basis of response control. *Progress in Neurobiology, 108*, 44–79. https://doi.org/10.1016/j.pneurobio.2013.06.005.

Berridge, C. W., & Waterhouse, B. D. (2003). The locus coeruleus–noradrenergic system: Modulation of behavioral state and state-dependent cognitive processes. *Brain Research Reviews, 42*(1), 33–84. https://doi.org/10.1016/s0165-0173(03)00143-7.

Boehler, C. N., Bunzeck, N., Krebs, R. M., Noesselt, T., Schoenfeld, M. A., Heinze, H. J., Munte, T. F., Woldorff, M. G., & Hopf, J. M. (2011). Substantia Nigra activity level predicts trial-to-trial adjustments in cognitive control. *Journal of Cognitive Neuroscience, 23*(2), 362–373.

Botvinick, M. M., Braver, T. S., Barch, D. M., Carter, C. S., & Cohen, J. D. (2001). Conflict monitoring and cognitive control. *Psychological Review, 108*(3), 624–652. https://doi.org/10.1037//0033-295X.I08.3.624.

Clark, L., Roiser, J. P., Cools, R., Rubinsztein, D. C., Sahakian, B. J., & Robbins, T. W. (2005). Stop signal response inhibition is not modulated by tryptophan depletion or the serotonin transporter polymorphism in healthy volunteers: Implications for the 5-HT theory of impulsivity. *Psychopharmacology, 182*(4), 570–578. https://doi.org/10.1007/s00213-005-0104-6.

Delgado, M. R., Gillis, M. M., & Phelps, E. A. (2008). Regulating the expectation of reward via cognitive strategies. *Nature Neuroscience, 11*(8), 880–881. https://doi.org/10.1038/nn.2141.

Depue, R. A., & Collins, P. F. (1999). Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences, 22*(03). https://doi.org/10.1017/s0140525x99002046.

Depue, R. A., & Lenzenweger, M. F. (2015). Toward a developmental psychopathology of personality disturbance: A neurobehavioral dimensional model. In *Developmental psychopathology.* New York, NY: Wiley, (pp. 762–796).

Eagle, D. M., Baunez, C., Hutcheson, D. M., Lehmann, O., Shah, A. P., & Robbins, T. W. (2008). Stop-signal reaction-time task performance: Role of prefrontal cortex and subthalamic nucleus. *Cerebral Cortex, 18*(1), 178–188. https://doi.org/10.1093/cercor/bhm044.

Eldar, S., & Bar-Haim, Y. (2010). Neural plasticity in response to attention training in anxiety. *Psychological Medicine, 40*(4), 667–677. https://doi.org/10.1017/S0033291709990766.

Eysenck, S. B., & Eysenck, H. J. (1977). The place of impulsiveness in a dimensional system of personality description. *British Journal of Social and Clinical Psychology, 16*, 57–68. https://doi.org/10.1111/j.2044-8260.1977.tb01003.x/abstract.

Fertuck, E. A., Lenzenweger, M. F., & Clarkin, J. F. (2005). The association between attentional and executive controls in the expression of borderline personality disorder features: A preliminary study. *Psychopathology, 38*(2), 75–81.

Fertuck, E. A., Lenzenweger, M. F., Clarkin, J. F., Hoermann, S., & Stanley, B. (2006). Executive

neurocognition, memory systems, and borderline personality disorder. *Clinical Psychology Review, 26*(3), 346–375.

Fried, I., Katz, A., McCarthy, G., Sass, K. J., Williamson, P., Spencer, S. S., & Spencer, D. D. (1991). Functional organization of human supplementary motor cortex studied by electrical stimulation. *Journal of Neuroscience, 11*(11), 3656–3666.

Goldstein, M., Brendel, G., Tuescher, O., Pan, H., Epstein, J., Beutel, M., et al. (2007). Neural substrates of the interaction of emotional stimulus processing and motor inhibitory control: An emotional linguistic go/no-go fMRI study. *NeuroImage, 36*(3), 1026–1040. https://doi.org/10.1016/j.neuroimage.2007.01.056.

Gut-Fayand, A., Dervaux, A., Olié, J.-P., Lôo, H., Poirier, M.-F., & Krebs, M.-O. (2001). Substance abuse and suicidality in schizophrenia: A common risk factor linked to impulsivity. *Psychiatry Research, 102*(1), 65–72. https://doi.org/10.1016/s0165-1781(01)00250-5.

Heaton, R. K., Chelune, G. J., Talley, J. L., Kay, G. G., & Curtis, G. (1993). *Wisconsin card sorting test manual* (Revised and Expanded ed.). Odessa: Psychological Assessment Resources.

Holroyd, C. B., & Coles, M. G. H. (2002). The neural basis of human error processing: Reinforcement learning, dopamine, and the error-related negativity. *Psychological Review, 109*(4), 679–709. https://doi.org/10.1037//0033-295x.109.4.679.

Jentsch, J. D., & Taylor, J. R. (1999). Impulsivity resulting from frontostriatal dysfunction in drug abuse: Implications for the control of behavior by reward-related stimuli. *Psychopharmacology, 146*, 373–390.

Lenzenweger, M. F., Clarkin, J. F., Fertuck, E. A., & Kernberg, O. F. (2004). Executive neurocognitive functioning and neurobehavioral systems indicators in borderline personality disorder: A preliminary study. *Journal of Personality Disorders, 18*(5), 421–438.

Li, C. S., Huang, C., Constable, R. T., & Sinha, R. (2006). Imaging response inhibition in a stop-signal task: Neural correlates independent of signal monitoring and post-response processing. *The Journal of Neuroscience, 26*(1), 186–192. https://doi.org/10.1523/JNEUROSCI.3741-05.2006.

Logan, G. D. (1982). On the ability to inhibit complex movements- a stop-signal study of typewriting. *Journal of Experimental Psychology: Human Perception and Performance, 8*, 778–792.

Logan, G. D. (1983). On the ability to inhibit simple thoughts and actions: 1. Stop signal studies of decision and memory. *Journal of Experimental Psychology: Learning, Memory and Cognition, 9*, 585–606.

Melara, R. D., Rao, A., & Tong, Y. (2002). The duality of selection: Excitatory and inhibitory processes in auditory selection attention. *Journal of Experimental Psychology: Human Perception and Performance, 28*(2), 279–306. https://doi.org/10.1037//0096-1523.28.2.279.

Moore, S. R., & Depue, R. A. (2016). Neurobehavioral foundation of environmental reactivity. *Psychological Bulletin, 142*(2), 107–164. https://doi.org/10.1037/bul0000028.

Nandam, L. S., Hester, R., Wagner, J., Cummins, T. D., Garner, K., Dean, A. J., et al. (2011). Methylphenidate but not atomoxetine or citalopram modulates inhibitory control and response time variability. *Biological Psychiatry, 69*(9), 902–904. https://doi.org/10.1016/j.biopsych.2010.11.014.

Nigg, J. T. (2001). Is ADHD a disinhibitory disorder? *Psychological Bulletin, 127*(5), 571–598.

Overtoom, C. C., Bekker, E. M., van der Molen, M. W., Verbaten, M. N., Kooij, J. J., Buitelaar, J. K., & Kenemans, J. L. (2009). Methylphenidate restores link between stop-signal sensory impact and successful stopping in adults with attention-deficit/hyperactivity disorder. *Biological Psychiatry, 65*(7), 614–619. https://doi.org/10.1016/j.biopsych.2008.10.048.

Perez, D. L., Vago, D. R., Pan, H., Root, J., Tuescher, O., Fuchs, B. H., … Stern, E. (2016). Frontolimbic neural circuit changes in emotional processing and inhibitory control associated with clinical improvement following transference-focused psychotherapy in borderline personality disorder. *Psychiatry and Clinical Neurosciences, 70*(1), 51–61. https://doi.org/10.1111/pcn.12357.

Robbins, T. W., & Arnsten, A. F. (2009). The neuropsychopharmacology of fronto-executive function: Monoaminergic modulation. *Annual Review of Neuroscience, 32*, 267–287. https://doi.org/10.1146/annurev.neuro.051508.135535.

Sara, S. J. (2009). The locus coeruleus and noradrenergic modulation of cognition. *Nature Reviews. Neuroscience, 10*(3), 211–223. https://doi.org/10.1038/nrn2573.

Spoont, M. (1992). Modulatory role of serotonin in neural information processing: Implications for human psychopathology. *Psychological Bulletin, 112*, 330–350.

Tellegen, A. (1982). *Multidimensional personality questionnaire manual*. Minneapolis: University of Minnesota Press.

Tellegen, A., & Waller, N. G. (1997). Exploring personality through test construction: Development of the multidimensional personality questionnaire. In *The SAGE Handbook of Personality Theory and Assessment: volume 2 – Personality Measurement and Testing*. London, UK: Sage, (pp. 261–292).

Yu, A. J., & Dayan, P. (2005). Uncertainty, neuromodulation, and attention. *Neuron, 46*(4), 681–692. https://doi.org/10.1016/j.neuron.2005.04.026.

Nonattendance

► Absenteeism

Nonconscious

▶ Automaticity
▶ Conscious, Preconscious, and Unconscious

Noncoronary Prone Behavior Pattern

▶ Type B Behavior Pattern

Non-criminal

▶ Dark Tetrad of Personality, The

Nondirective Psychotherapy

▶ Person-Centered Therapy (Client-Centered)

Nondirective Techniques

▶ Reflection (Therapeutic Behavior)

Nonhuman Primates

Jennifer Vonk
Oakland University, Rochester, MI, USA

Synonyms

Anthropoids; Apes; Monkeys; Primate order; Primates; Prosimians

Definition

Primates comprise an order within Mammalia and consist of prosimians, monkeys, and ape species.

Introduction

Despite the popularity of the topic of human personality within Psychology, research into the personality of animals was discouraged until fairly recently in Psychology's history. Even in modern times, the term "personality" has been eschewed in favor of terms such as "behavioral syndrome," "behavioral type," "temperament," or "disposition." Alternatively, researchers have simply referred to "individual differences." This aversion to the idea of animal personalities likely owes a debt to the Cartesian notion that only humans had souls or were capable of emotion. Animals were likened to machines, and intraspecies variability was considered uninteresting relative to interspecies differences. In contrast, today, researchers are actively exploring the extent to which nonhumans exhibit stable and enduring characteristics akin to human personality traits (for two recent edited volumes devoted to this topic see Carere and Maestripieri 2013 and Vonk et al. under contract). An entire volume has been devoted solely to personality in nonhuman primates as well (Weiss et al. 2011b). Acknowledging such differences within species can help to guide animal welfare decisions in captive settings and to inform conservation efforts both in the wild and in captivity. The study of animal personality can also enhance understanding of differences in cognitive performance in psychological research with nonhumans.

Studies of Personality in Nonhuman Primates

References to unique dispositions of animal subjects appear in the writing of researchers long before the empirical study of temperament in nonhumans was deemed acceptable. For example, Kinnaman spoke of individual temperaments in his monkey subjects as far back as 1902. Better known work is that of Ivan Pavlov, who explicitly studied such topics as neuroses in his canine subjects. Pavlov recognized that dogs exhibited markedly distinct reactions to the same environmental stimuli, with dogs showing extreme reactivity being most likely to develop anxious and

neurotic behaviors later, and more likely to forget conditioned responses (Pavlov 1966). These behavioral syndromes in dogs were likened to the human concept of Type A personality, but the concepts of passivity and extreme reactivity may also relate to Eysenck's notion of introversion and extraversion. Pavlov was far ahead of his time in linking broad classes of behaviors to physiological components, for example, believing traits to arise as a function of the animal's nervous system. Although not fully appreciated in its time, today's researchers have found great value in such basic research. Temperament can now be used to predict an animal's performance in roles such as service dogs, police dogs, animal demonstrators, and so on. Furthermore, researchers can use information about the genetic or physiological basis for such traits to aid in selective breeding or conservation programs. Enrichment items and even pet-owners can be matched to individuals based on their unique personalities. Thus, along with providing a deeper theoretical understanding of the evolution of personality in humans, the study of nonhuman personality has many practical applications.

The majority of the work on personality in nonhumans has focused on nonhuman primates, in particular, the closest living relatives to humans – chimpanzees. Crawford (1938) developed the first behavior rating scale that provided evidence of variable chimpanzee personalities. Crawford forecasted later debates in the field by voicing concern with the use of both rating scales and observations of specific behaviors by trained observers. These two techniques exemplify the methods of rating versus coding that are often used today in assessing nonhuman personality. Although both techniques require expertise, only the rating method requires the rater to be intimately familiar with the subjects. Of course, both methods rely on human observers and, thus, are subject to anthropomorphism and lack of objectivity.

Crawford's early attempts to quantify individual differences in chimpanzees were followed by Hebb's 1949 project, "Temperament in Chimpanzees." Hebb, like Crawford, was interested in the consistency of behavior across time and contexts, such as feeding, but relied primarily on observation, rather than rating scales. Hebb identified broad categories of behaviors such as friendliness, aggression, avoidance, and unresponsiveness.

Later projects followed in the tradition of coding behavior across contexts, such as group interactions, exposure to infants, but added the use of factor analytic techniques to reduce the observed behaviors into factors. Chamove et al. (1972) found that factors of hostility, fear, and sociality emerged from such analyses. These factors appeared roughly analogous to the human personality factors of psychoticism, neuroticism-stability, and extraversion-introversion. Factor analysis was also applied to the rating scale approach of Crawford, in Stevenson-Hinde's work with macaques (Stevenson-Hinde and Hinde 2011). Hinde's work suggested two important factors; a confident to fearful dimension and an active to slow dimension. Later versions of her scale produced a third dimension of traits from sociable to solitary. These dimensions also align with the earlier work of Chamove et al. (1972). More recent work from Suomi's lab (e.g., Suomi et al. 2011) has identified traits of fearfulness or anxiety, impulsivity, and more relaxed traits, which also appear somewhat analogous to a subset of human specific traits. Suomi and colleagues have extended the study of personality traits to identify influences of rearing and genetics on personality. In addition to clarifying the development of personality in nonhuman primates, such studies are crucial to understanding human personality. One reason for this is that experimental techniques that are not possible with humans can sometimes be applied to nonhumans. For example, infant primates can be cross fostered, which allows researchers to disentangle the influence of genetics and rearing environment on later personality development.

Conversely, data from humans can also inform the study of nonhuman personality. Because the study of human personality is farther along, researchers can also extend findings from techniques used only in humans, such as questionnaires, to seek similar factors in nonhuman personality structure. Although researchers have applied the five-factor model (e.g., introversion/extraversion,

conscientiousness, neuroticism, openness, agreeableness) to nonhuman primates, these studies have failed to confirm the presence of the same five factors and have also often indicated an additional factor. This sixth factor is sometimes identified as dominance, which appears to be extremely important for describing variability in chimpanzee behavior (King and Figueredo 1997). Since this key publication, the study of animal personality has virtually exploded and it is likely that the human conception of nonhuman primate personality will continue to evolve over the next several decades. Freeman et al. (2013) also identified six factors to describe chimpanzee personality, but their sixth factor was tentatively labeled, "Methodical" and awaits further data. This factor includes, in addition to methodical itself, intelligence and self-caring. Freeman et al. identified the challenges of both "top-down" approaches that apply ideas about traits previously identified in other species to the species in question, with "bottom-up" approaches that derive traits specifically for the species in question, but may hinder comparisons to other species. Other approaches, such as the circumplex model of human personality, have not yet been applied to nonhuman primates, but should prove to be a fruitful approach (see Zeigler-Hill and Highfill in press). A circumplex model might examine where individuals fall along a continuum of complimentary traits such as dominance/subordination and affiliation/aggression.

Conclusion

Because this is a bourgeoning area of research, the current state of knowledge should be viewed as preliminary. Although there are some basic similarities between the personality of humans and other apes that cannot be attributed to anthropocentric biases (Weiss et al. 2012), Weiss et al. (2011a) have also shown that a single general factor of personality does not appear to be shared between chimpanzees, orangutans, and rhesus macaques, suggesting the need to study each species separately. Some authors have also argued for four, rather than five- or six-factor solutions, and it is not yet clear how neatly the factors derived from studies of nonhumans map onto the traits validated in human samples. What can be conclusively determined, however, is that nonhuman primates show as much variability as their human counterparts and can no longer be considered machine-like counterparts to humans.

Cross-References

- ▶ Animal Personality
- ▶ Big Five Inventory
- ▶ Big-Five Model
- ▶ Capitanio, John P.
- ▶ Circumplex (General)
- ▶ Five-Factor Personality Inventory-Children
- ▶ Personality Structure
- ▶ Temperament
- ▶ Weiss, Alexander

References

Carere, C., & Maestripieri, D. (2013). *Animal personalities: Behavior, physiology, and evolution*. Chicago: University of Chicago Press.

Chamove, A. S., Eysenck, H. J., & Harlow, H. F. (1972). Personality in monkeys: Factor analyses of rhesus social behavior. *Quarterly Journal of Experimental Psychology, 24*, 496–504.

Crawford, M. P. (1938). A behavior rating scale for young chimpanzees. *Journal of Comparative Psychology, 26*, 79–92.

Freeman, H. D., Brosnan, S. F., Hopper, L. M., Lambeth, S. P., Schapiro, S. J., & Gosling, S. D. (2013). Developing a comprehensive and comparative questionnaire for measuring personality in chimpanzees using a simultaneous top-down/bottom-up design. *American Journal of Primatology, 75*, 1042–1053.

King, J. E., & Figueredo, A. J. (1997). The five-factor model plus dominance in chimpanzee personality. *Journal of Research in Personality, 31*, 257–271.

Kinnaman, A. J. (1902). Mental life of two *Macacus rhesus* monkeys in captivity I. *The American Journal of Psychology, 13*, 98–148.

Pavlov, I. (1966). Constitutional differences and functional disturbances: Experimental neuroses. In M. Kaplan (Ed.), *Essential works of Pavlov* (pp. 261–267). New York: Bantam Books.

Stevenson-Hinde, J., & Hinde, C. A. (2011). Individual characteristics: Weaving psychological and ethological approaches. In A. Weiss, E. J. King, & L. Murray (Eds.), *Personality and temperament in nonhuman primates* (pp. 3–14). New York: Springer.

Suomi, S. J., Chaffin, A. C., & Higley, J. D. (2011). Reactivity and behavioral inhibition as personality traits in nonhuman primates. In A. Weiss, J. E. King, & L. Murray (Eds.), *Personality and temperament in nonhuman primates* (pp. 285–311). New York: Springer.

Vonk, J., Weiss, A., & Kuczaj, S. (under contract). Personality in non-human animals. Springer. New York.

Weiss, A., Adams, M. J., & Johnson, W. (2011a). The big none: No evidence for a general factor of personality in chimpanzees, orangutans, or rhesus macaques. *Journal of Research in Personality, 45*, 393–397.

Weiss, A, King, E. J., & Murray, L. (Eds.). (2011b). *Personality and temperament in nonhuman primates* (pp. 3–14). New York: Springer New York.

Weiss, A., Inoue-Murayama, M., King, J. E., Adams, M. J., & Matsuzawa, T. (2012). All too human? chimpanzee and orang-utan personalities are not anthropomorphic projections. *Animal Behaviour, 83*, 1355–1365.

Zeigler-Hill, V., & Highfill, L. (in press). The interpersonal circumplex: A complementary approach for studying animal personality. In J. Vonk, A. Weiss, & S. Kuzjac (Eds.), *Personality in non-humans*. New York: Springer.

Nonverbal Communication

► Body Language
► Facial Expressions and Emotion

Nonverbal Display of Power

► Power Posing

Nonverbal Emotional Expression

► Emotional Expressiveness

Noradrenaline

Seiichiro Amemiya
Department of Neuroscience, University of Minnesota, Minneapolis, MN, USA

Synonyms

Norepinephrine

Definition

Noradrenaline is an endogenous substance classified into catecholamine family.

Introduction

Noradrenaline is a catecholamine produced in the body and brain and works as a neurotransmitter and hormone. It has been revealed that noradrenaline plays various roles in regulation of the body and brain and dysfunction of noradrenaline is related to multiple disorders.

Synthesis

Noradrenaline is synthesized from the amino acid tyrosine through a series of enzymatic reactions (Daubner et al. 2011). This biosynthetic cascade begins with the hydroxylation of tyrosine into L-dihydroxyphenylalanine (L-DOPA) by tyrosine hydroxylases, followed by the decarboxylation of L-DOPA to dopamine by dopa-decarboxylase. Beta-hydroxylase catalyzes hydroxylation of dopamine to noradrenaline.

Receptors

Noradrenaline acts via adrenergic receptors, which are G protein-coupled receptor (Strosberg 1993). Noradrenergic receptors are classified into two main groups α and β. The α receptors are further divided into two subtypes α1 and α2, and the β receptors are divided into three subtypes β1, β2, and β3. The α1 and β receptors have excitatory effects on target tissues and neurons via different intracellular signal transduction pathways. The α2 receptor mainly locates on presynaptic terminal and cell body of noradrenergic neurons and causes feedback inhibition to noradrenaline release.

In the Peripheral Nervous System

In the peripheral nervous system, noradrenaline is released from postganglionic sympathetic neurons, which innervate the effector organs (McCorry 2007). Noradrenaline is also released as a stress hormone into blood vessels from the adrenal medulla by the sympathetic activation (McCorry 2007). The noradrenaline release triggers homeostatic responses referred to as the "fight or flight response," such as dilating the pupil and increasing heart rate, blood pressure, glucose release, and perspiration (Ulrich-Lai and Herman 2009; McCorry 2007).

In the Central Nervous System

In the central nervous system (CNS), noradrenaline is released from noradrenergic neurons located in the brain stem. The largest aggregate of noradrenergic neurons is the locus coeruleus and is known as the locus coeruleus-noradrenergic system (Sara 2009; Berridge 2003). Noradrenergic neurons in the locus coeruleus innervate majority of brain regions including the cortex, hippocampus, amygdala, hypothalamus, and brain stem and supply noradrenaline throughout the central nervous system (Berridge 2003; Sara 2009). The locus coeruleus-noradrenergic system is involved in sleep-arousal cycle, emotional responses, sensory information processes, attention and memory, and executive functions (Berridge 2003; Sara 2009). Another major aggregate of noradrenergic neurons is nucleus of the solitary tract, and these cells supply noradrenaline to the amygdala and hypothalamus, mediating emotional and hormonal responses (Ferry et al. 1999).

Noradrenaline release in the brain depends on arousal state, which is a brain state being sensitive to environmental stimuli. Noradrenaline level increases during awaking and decreases during sleep and enhances and maintains arousal and alertness (Berridge 2003). Within waking state, noradrenaline release increases in response to salient environment stimuli (Berridge 2003). Especially in cognitive tasks, noradrenaline is released in response to task-relevant stimuli to guide performance of the cognitive tasks (Sara 2009). The noradrenaline response to relevant stimuli controls attention to the important information for executive control and adaptive behaviors and enhances memory about it.

Stress

Noradrenaline is remarkably released into the brain under various stressful events, including emotional stresses, and induces hormonal defensive responses. Noradrenaline release is driven by aversive and noxious stimuli/environment (Berridge 2003) and activates the hypothalamic-pituitary-adrenal axis, which secretes corticotropin-releasing factor from the hypothalamus and glucocorticoids from the adrenal grand (Ulrich-lai and Herman 2009). The stress-induced noradrenaline, especially from the locus coeruleus, increases the sympathetic tone via projections to the spinal cord and autonomic nuclei in the brain stem to control autonomic functions and associated with fearful/anxiety responses and behaviors (Ulrich-lai and Herman 2009). The stress-induced noradrenaline also affects cognitive functions. For example, high level of noradrenaline release in the prefrontal cortex impairs executive functions, such as working memory and attentional control (Arnsten 2009), and, in contrast, enhances memory consolidation about the emotional events through affecting the amygdala (Sara 2009).

Disorders

Noradrenaline plays a role in mood and anxiety and malfunction of noradrenaline causes in psychiatric (mental illness) symptoms. It is thought that symptoms of panic disorder are caused by hyperactivation of noradrenaline in the central and/or the sympathetic nervous system (Sullivan et al. 1999). Chronic hyper release of noradrenaline is associated with generalized anxiety disorder (Sullivan et al. 1999). While stress-induced noradrenaline enhances memory consolidation

about fearful events, inappropriate expression of the fearful memories is a cause of post-traumatic stress disorder (PTSD) (Sara 2009). Low level of noradrenaline also links to psychiatric disorders such as depression (Moret and Briley 2011). Furthermore, inappropriate release of noradrenaline in the prefrontal cortex causes cognitive deficits in psychiatric disorders including attention-deficit hyperactivity disorder (ADHD) (Arnsten 2009).

Conclusion

Noradrenaline peripherally and centrally contributes to multiple functions including autonomic and hormonal responses, stress responses, emotional responses, and cognitive functions in response to the environment. The regulation of the body and brain by noradrenaline can influence affect, behavior, and cognition.

Cross-References

▶ Role of Neurotransmitters

References

Arnsten, A. F. (2009). Stress signalling pathways that impair prefrontal cortex structure and function. *Nature Reviews Neuroscience, 10*, 410–422.

Berridge, C. W. (2003). The locus coeruleus–noradrenergic system: Modulation of behavioral state and state-dependent cognitive processes. *Brain Research Reviews, 42*, 33–84.

Daubner, S. C., Le, T., & Wang, S. (2011). Tyrosine hydroxylase and regulation of dopamine synthesis. *Archives of Biochemistry and Biophysics, 508*, 1–12.

Ferry, B., Roozendaal, B., & McGaugh, J. L. (1999). Role of norepinephrine in mediating stress hormone regulation of long-term memory storage: A critical involvement of the amygdala. *Biological Psychiatry, 46*, 1140–1152.

McCorry, L. K. (2007). Physiology of the autonomic nervous system. *American Journal of Pharmaceutical Education, 71*, 78.

Moret, C., & Briley, M. (2011). The importance of norepinephrine in depression. *Neuropsychiatric Disease and Treatment, 7*, 9–13.

Sara, S. J. (2009). The locus coeruleus and noradrenergic modulation of cognition. *Nature Reviews Neuroscience, 10*, 211–223.

Strosberg, A. D. (1993). Structure, function, and regulation of adrenergic receptors. *Protein Sci Publ Protein Soc, 2*, 1198–1209.

Sullivan, G. M., Coplan, J. D., Kent, J. M., & Gorman, J. M. (1999). The noradrenergic system in pathological anxiety: A focus on panic with relevance to generalized anxiety and phobias. *Biological Psychiatry, 46*, 1205–1218.

Ulrich-Lai, Y. M., & Herman, J. P. (2009). Neural regulation of endocrine and autonomic stress responses. *Nature Reviews Neuroscience, 10*, 397–409.

Norepinephrine

▶ Noradrenaline

Normal Curve

▶ Bell-Shaped Distribution of Personality Traits

Normative Change

▶ Normative Personality Development

Normative Personality Development

Betsi Little
National University, La Jolla, CA, USA

Synonyms

Mean-level change; Normative change; Typical development

Definition

Normative personality development refers to the stages of growth or maturation that the majority

of people of a specific age are expected to achieve (Meggit 2006) or generalizable trends of trait expression across the lifespan (Caspi et al. 2005).

Introduction

Personality is defined as individual differences in the way one thinks, feels, and behaves. These differences are viewed as characteristic and enduring pattern cognitions and behavior, presented by the individual (McCrae and Costa 2008), while there is some debate as to whether these patterns are stable over time, described as traits, or whether external, environmental factors, or states, irrevocably change personality expression. Indeed changes in personality expression may result from intrinsic factors, such as maturation and motivation, or external, environmental factors, such as social pressure to find and follow a specific role.

Normative personality development is the generalizable trends in trait expression across the lifespan. The development of personality traits result from physical, environmental, and psychosocial changes, which occur at predictable age periods, and are referred to as normative change, or mean-level change. Several theories describe both intrinsic and extrinsic factors that create change; however, few have been supported by empirical evidence.

Normative Development

Normative personality development is the relatively stable and predictable change in personality traits over the lifespan. The development of a person's personality occurs throughout the lifespan. While much of the research in this field focuses on the development of personality from early childhood through young adulthood, it is widely recognized that the developmental process continues through old age. Several theories seek to describe, explain, and predict these normative changes.

Two Personality Models

Erikson's Psychoanalytic Theory of Psychosocial Development

Erikson (1950, 1963) put forth a theory of development that breaks down an individual's whole lifespan into eight stages, each of which includes a psychosocial crisis. How the individual experiences and resolves the crisis, according to Erikson, would create a positive or negative outcome for personality development.

Erikson, unlike his predecessor Freud, emphasized the role of culture and society in the development of personality. According to Erikson, inner conflict, as described by Freud as between the id and superego, actually takes place solely within the ego. Indeed, the ego develops as it successfully resolves the conflict between an individual's desires and the desires of the society in which they live. Successful navigation of this process allows an individual to develop trust in others, develop a sense of autonomy and identity, and determine how one will live out the rest of one's life.

Erikson's theory is based on the epigenetic principle, or that personality develops in a specific predetermined order that builds on earlier development. This "maturation timetable" describes the acquisition and integration of life skills and abilities that presumably creates an autonomous individual who is a functioning member of society.

Research has demonstrated that resolution (or lack thereof) of these stages at an early age have significant impact on the individual in adulthood. For example, those who struggle creating secure attachment in infancy show later difficulties in romantic relationships (Pittman et al. 2011).

Five-Factor Theory of Personality

The Five-Factor Theory of Personality (McCrae and Costa 1987) is comprised of five broad categories of traits that are biologically based. The five traits represented in the big five were discovered through statistical factorial analysis. In other words, it is one of the relatively few,

empirically based personality theories. Each of the dimensions of personality is viewed as a continuum with extreme endpoints. For example, Extroversion represents one end of the spectrum, with Introversion anchoring the other end. Each individual would find their level of Extroversion on that continuum. The five traits include Extraversion, Agreeableness, Openness to new experience, Neuroticism, and Conscientiousness.

Much research on normative personality development has utilized the Five-Factor model to test for stable and predictable personality change across the lifespan.

Soto (2015), researching normative personality development of adolescents, found that curvilinear, U-shaped age trends for Agreeableness, Conscientiousness, and Openness, such that as adolescents age, they first demonstrate declining levels for these traits, but then it rebounds and increases in levels. Additionally, Soto discovered higher levels of Conscientiousness and Agreeableness among girls than boys, as well as higher levels of Neuroticism, with girls scoring higher than boys by mid-adolescence.

Milojev and Sibley (2017) reported that Extraversion decreased as people aged, with the most pronounced declines occurring in young adulthood, and then again in old age. Agreeableness decreased in young adulthood and remained relatively unchanged thereafter. Conscientiousness increased among young adults remained stable over their lifespan. Neuroticism and Openness to experience decreased as people aged.

As Durbin and Hicks (2014) reported, Agreeableness increased in young adulthood from ages 22–30 through middle age. Conscientiousness increased steadily throughout adulthood from ages 22–70, while Neuroticism decreased steadily until about age 40 and was stable thereafter. Openness to experience increased in adolescence and young adulthood and decreased in old age.

Causes for Personality Change

There are many explanations for why individual personalities develop at a normative pace. A number of longitudinal studies produced results that allowed the creation of a number of principles of normative personality development. Two concepts, outlined by Caspi et al. (2005) help shed light on current theories for personality development.

The Maturity Principle. The Maturity Principle refers to the idea that specific personality traits will typically trend in a certain direction as one ages. Maturity can be described as the process in which an individual becomes a functioning, productive member of society. When an individual expresses a need in society, the manner in which they express that (through personality) is either rewarded or punished. As individuals learn how to interact with the environment to meet their needs, they learn more successful strategies to meet those needs. This is viewed as maturation. An individual achieves this maturity through planning, decisiveness, deliberation, consideration, and charity. These characteristics are correlated to the Big Five Personality Traits of Emotional Stability (Neuroticism, Conscientiousness, and Agreeableness) and have been found to increase with age.

The Cumulative Continuity Principle. Personality traits tend to stabilize as we age. Factors, such as genetic "set-points" the individual's environment, commitment to identity, and positive feedback, contribute to normative personality development. An individual may end up, seek out, or create an environment that corresponds with their personality. This niche building, promotes continuity of personality by eliminating competing environments that may elicit personality change. As the individual ages, they begin to develop and commit to an identity. Stronger identities filter life experiences, and the selection of future life experiences, which create a personality reinforcement feedback loop. The individual selects the environment that is most likely to reinforce his or her personality trait expression. Additionally, the individual's identity becomes known to others in the community in the form of a reputation. Thus, an individual may "act in to" the reputation he or she is known for.

Conclusion

Normative personality development is the predictable and relatively stable stages of growth or maturation that the majority of people of a specific age are expected to achieve. Several theories explain what stages or environmental presses are likely to cause personality change in an individual, as well as what successful navigation of these crises should look like in personality expression.

Cross-References

- ▶ Developmental Changes in Personality Traits
- ▶ Developmental Plasticity
- ▶ Environmental Conditions and the Development of Personality

References

Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology, 56*, 453–484.

Durbin, C. E., & Hicks, B. M. (2014). Personality and psychopathology: A stagnant field in need of development. *European Journal of Personality, 28*(4), 362–386.

Erikson, E. H. (1950, 1963). *Childhood and society.* New York: Norton.

McCrae, R. R., & Costa, P. T. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology, 52*(1), 81–90.

McCrae, R. R., & Costa, P. T., Jr. (2008). Empirical and theoretical status of the five-factor model of personality traits. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), *The SAGE handbook of personality theory and assessment, Vol. 1. Personality theories and models* (pp. 273–294). Thousand Oaks: Sage.

Meggitt, C. (2006). *Child development* (2nd ed., p. 74). Essex: Heinemann.

Milojev, P., & Sibley, C. G. (2017). Normative personality trait development in adulthood: A 6-year cohort-sequential growth model. *Journal of Personality and Social Psychology, 112*(3), 510–526.

Pittman, J. F., Keiley, M. K., Kerpelman, J. L., & Vaughn, B. E. (2011). Attachment, identity, and intimacy: Parallels between Bowlby's and Erikson's paradigms. *Journal of Family Theory and Review, 3*(1), 32–46.

Soto, C. J. (2015). The little six personality dimensions from early childhood to early adulthood: Mean-level age and gender differences in parents' reports. *Journal of Personality, 84*(4), 409–422. August 2016.

Nosology

▶ International Classification of Diseases 11th Edition (ICD-11)

Nostalgia

▶ Sentimentality

Not Guilty by Reason of Insanity

▶ M'Naghten Rule

Novel

▶ Creativity

Novelty Seeking

M. C. Arenas and C. Manzanedo
Unidad de investigación Psicobiología de las Drogodependencias, Departamento de Psicobiología, Facultad de Psicología, Universitat de València, Valencia, Spain

Synonyms

Novelty seeking or sensation seeking

Definition

Novelty seeking (or sensation seeking) is a personality trait that refers to a tendency to pursue new experiences with intense emotional sensations. It is a multifaceted behavioral construct that includes thrill seeking, novelty

preference, risk taking, harm avoidance, and reward dependence.

Introduction

The novelty-seeking trait is considered a heritable tendency of individuals to take risks for the purpose of achieving stimulation and seeking new environments and situations that make their experiences more intense. This trait has been associated with the level of motive and excitement in response to novelty. Persons with high levels of novelty seeking have been described as more impulsive and disorderly than low novelty seekers and have a higher propensity to get involved in risky activities, such as starting to misuse drugs, engaging in risky sexual activities, and suffering accidental injuries. Novelty seeking has been linked to basal dopaminergic activity, and it is one of the individual factors that predict a person's vulnerability to develop pathological gambling, as well as substance use and eating disorders (Black et al. 2015; Norbury and Husain 2015). Hence, this trait is considered an endophenotype, since it is a phenotype with a genetic connection which may exert an effect on an individual's susceptibility to develop some behavioral disorders.

History

The sensation-seeking term was defined in 1964 by Zuckerman, who developed the "Sensation Seeking Scale," which contained four dimensions interrelated into a multidimensional measure: thrill and adventure seeking, new experience seeking, boredom susceptibility, and disinhibition. Subsequently, the scale was validated and replicated, and it is one of the most common psychological instruments for measuring novelty seeking. Later, Cloninger and co-workers extended the work of Zuckerman and postulated a tridimensional model of temperament: novelty seeking, harm avoidance, and reward dependence, developing "Cloninger's Tridimensional Personality Questionnaire" (TPQ). Cloninger et al. (1994) proposed excitability surrounding novel experiences (exploratory excitability) and impulsive decision making (impulsiveness) to parse the novelty-seeking construct. Both authors correlated the scales of their structural models for personality and defined novelty or sensation seeking as a fundamental dimension of temperament (Zuckerman and Cloninger 1996).

Evaluation

The novelty-seeking trait is measured by means of scales and questionnaires in humans and behavioral tests in animals, since it can be evaluated with similar behavioral patterns in both animals and humans. The most common tests used to measure novelty seeking in humans are (1) "Zuckerman Sensation Seeking Scale," with four subscales (thrill and adventure seeking, disinhibition, experience seeking, and boredom susceptibility); (2) "Tridimensional Personality Questionnaire," with novelty-seeking, harm avoidance, and reward-dependence subscales; and (3) "Temperament and Character Inventory," with seven subscales (novelty seeking, harm avoidance, reward dependence, persistence, self-directedness, cooperativeness, and self-transcendence) (Wingo et al. 2015).

Numerous animal models have been developed for studying this phenotype. Rodents also show an innate preference for novelty, which is conditioned by the interaction of factors such as level of activity, motivation to explore, and fear/anxiety. Novelty/sensation seeking in rodents has been defined as the enhanced specific exploration of novel situations, unknown objects, or stimuli. Two different approaches are employed to model the novelty/sensation-seeking trait: procedures that measure animals' motor reactivity to a new "inescapable/forced" environment and procedures that evaluate animals' "free-choice" preference for novel objects or environments. In the first procedure, animals are confined to a determinate place, and its novelty-induced locomotor reactivity is assessed, while in the second procedure, they can freely choose between the novel and familiar environment/object (Arenas et al. 2016).

Sex Differences in Novelty Seeking

In general, men tend to show higher novelty-seeking levels than women, and this difference has been reported across populations, and it has remained stable across the years. However, sex differences have diminished in some novelty-seeking behaviors, such as thrill and adventure seeking, while they have persisted in others, like disinhibition and boredom susceptibility. Therefore, men's propensity to report higher novelty-seeking behaviors than women seems to remain the same, whereas the sex differences in the behavioral manifestations do not. This fact could reflect an interaction between genetically influenced predispositions and changes in social norms (Cross et al. 2013).

Novelty Seeking and Adolescence

Adolescent subjects present higher level of novelty seeking in comparison with adults. Adolescence is a critical developmental period associated with risk-taking behavior due to its hyper-responsiveness to rewards and its lack of the capacity for self-restraint and emotional regulation (Braams et al. 2015). The characteristic behaviors of adolescents, such as impulsivity, emotional liability, increased risk taking, and enhanced novelty seeking, seem to be related to changes in functions of dopaminergic activity and the lack of prefrontal cortical maturation. Thus, this predisposition of adolescents to impulsive and novelty-seeking behaviors is related with an imbalance between the mesolimbic pathway reward and prefrontal areas of inhibitory control (Ernst et al. 2009).

Neurobiological Substrates

The novelty/sensation-seeking trait seems to be associated with differences in striatal dopamine function; specifically, animal higher novelty seekers may have higher endogenous striatal dopamine levels, stronger dopaminergic responses to reward cues, and lower availability of D2-type (D2/D3/D4) dopamine receptors in the striatum. Thus, a combination of high dopaminergic tone and a lower density of D2-type receptors in the striatum are potential contributors to the higher novelty/sensation-seeking endophenotype, as reflected by an increased tendency to exhibit approach reactions toward novel stimuli which, on the contrary, elicit aversive reactions in others (Norbury and Husain 2015).

Novelty Seeking and Drug Abuse

There is strong evidence that high novelty seekers exhibit an increased risk of drug abuse in comparison with low novelty seekers. This endophenotype may explain the development to addiction among some individuals exposed to drugs of abuse, mainly during adolescence (Bidwell et al. 2015). Studies have demonstrated that the novelty-seeking trait is associated with sensitivity to the rewarding effects of drugs of abuse, as well as with drug craving and a relapse to drug consumption.

Conclusion

Novelty or sensation seeking is considered a major personality dimension for its important biological basis and its high heritability (Zuckerman and Cloninger 1996). This endophenotype designates individual differences in motivation for novelty and has been associated with impulsivity and risk-taking behaviors. It has also been identified as a personality trait that predicts an individual's vulnerability to develop a drug use disorder.

Cross-References

- ▶ Cloninger, C. Robert
- ▶ Developmental Changes in Personality Traits
- ▶ Genetic Basis of Traits
- ▶ Heritability of Personality Traits
- ▶ Personality and Alcohol Abuse
- ▶ Personality and Sexual Addiction
- ▶ Personality Development in Adolescence
- ▶ Personality Development Young Adulthood

- ▶ Sensation Seeking
- ▶ Sensation Seeking Scale

References

Arenas, M. C., Aguilar, M. A., Montagud-Romero, S., Mateos-García, A., Navarro-Francés, C. I., Miñarro, J., et al. (2016). Influence of the novelty-seeking endophenotype on the rewarding effects of pychostimulant drugs in animal models. *Current Neuropharmacology, 14*(1), 87–100.

Bidwell, L. C., Knopik, V. S., Audrain-McGovern, J., Glynn, T. R., Spillane, N. S., Ray, L. A., et al. (2015). Novelty seeking as a phenotypic marker of adolescent substance use. *Substance Abuse: Research and Treatment, 9*(S1), 1–10. https://doi.org/10.4137/SART.S22440.

Black, D. W., Coryell, W. H., Crowe, R. R., Shaw, M., McCormick, B., & Allen, J. (2015). Personality disorders, impulsiveness, and novelty seeking in persons with DSM-IV pathological gambling and their first-degree relatives. *Journal of Gambling Studies, 31*(4), 1201–1214. https://doi.org/10.1007/s10899-014-9505-y.

Braams, B. R., van Duijvenvoorde, A. C., Peper, J. S., & Crone, E. A. (2015). Longitudinal changes in adolescent risk-taking: A comprehensive study of neural responses to rewards, pubertal development, and risk-taking behavior. *Journal of Neuroscience, 35*(18), 7226–7238. https://doi.org/10.1523/JNEUROSCI.4764-14.

Cloninger, C. R., Przybeck, T. R., Svrakic, D. M., & Wetzel, R. D. (1994). *The temperament and character inventory (TCI): A guide to its development and use*. St. Louis: Center for Psychobiology and Personality.

Cross, C. P., Cyrenne, D. L., & Brown, G. R. (2013). Sex differences in sensation-seeking: A meta-analysis. *Scientific Reports, 3*, 2486. https://doi.org/10.1038/srep02486.

Ernst, M., Romeo, R. D., & Andersen, S. L. (2009). Neurobiology of the development of motivated behaviors in adolescence: A window into a neural systems model. *Pharmacology, Biochemistry, and Behavior, 93*, 199–211. https://doi.org/10.1016/j.pbb.2008.12.013.

Norbury, A., & Husain, M. (2015). Sensation-seeking: Dopaminergic modulation and risk for psychopathology. *Behavioural Brain Research, 288*, 79–93. https://doi.org/10.1016/j.bbr.2015.04.015.

Wingo, T., Nesil, T., Choi, J. S., & Li, M. D. (2015). Novelty seeking and drug addiction in humans and animals: From behavior to molecules. *Journal of Neuroimmune Pharmacology, 11*(3), 456–470. https://doi.org/10.1007/s11481-015-9636-7.

Zuckerman, M., & Cloninger, C. R. (1996). Relationships between Cloninger's, Zuckerman's, and Eysenck's dimensions of personality. *Personality and Individual Differences, 21*(2), 283–285. https://doi.org/10.1016/0191-8869(96)00042-6.

Novelty Seeking or Sensation Seeking

- ▶ Novelty Seeking

NPI

- ▶ Narcissistic Personality Inventory

nPower

- ▶ Need for Power

Null Hypothesis

Tom Booth[1], Alex Doumas[1] and Aja Louise Murray[2]
[1]Department of Psychology, University of Edinburgh, Edinburgh, UK
[2]Violence Research Centre, Institute of Criminology, University of Cambridge, Cambridge, UK

Definition

In formal hypothesis testing, the null hypothesis (H_0) is the hypothesis assumed to be true in the population and which gives rise to the sampling distribution of the test statistic in question (Hays 1994). The critical feature of the null hypothesis across hypothesis testing frameworks is that it is stated with enough precision that it can be tested.

Introduction

A hypothesis is a statement or explanation about the nature or causes of some phenomena of interest. In the process of scientific study, we can

distinguish two forms of hypotheses. A research hypothesis poses the question of interest, and if well stated, will include the variables under study and the expected relationship between them. A statistical hypothesis translates the research hypothesis into a mathematically precise, statistically testable statement concerning the assumed value of a parameter of interest in the population. The null hypothesis is an example of a statistical hypothesis.

In order to test these hypotheses, the researcher designs a study, measures the variables of interest, and calculates a statistic, such as a mean difference, or a correlation, which acts as a sample estimate of the population parameter defined by our statistical hypothesis. The researcher will then seek to make some inferences about the population, from the evidence (data) they have collected in their sample.

An Example

Suppose a researcher was interested in levels of conscientiousness in university students. They have a research hypothesis that males and females differ in their level of conscientiousness. The researcher randomly samples 50 male and 50 female first year university students. They ask each student to answer a self-report conscientiousness questionnaire and calculate a score for each individual. They then take the average, arithmetic mean, value for males and females. The researcher finds males have a mean of 15 and a standard deviation of 4, whereas the females have a mean of 17 and a standard deviation of 4. From these values, the research can calculate a test statistic for the difference in means, a *t*-statistic. Here, the value is $t = 2.5$.

The Null Hypothesis, Populations, Samples, and Sampling Distributions

In order to move from this single value of a test statistic, to drawing inferences about the population, a formal hypothesis testing framework is required that allows an evaluation of a sample statistic with reference to a corresponding population parameter. Here, the null hypothesis plays a central role in that it states a specific value for the population parameter. As the true value of the population parameter is rarely, if ever, known, the specific value specified in the null hypothesis can only be *assumed* to be true. For the mean difference example presented here, the researcher assumes that the mean difference in the population is 0 ($t = 0$). Put differently, this null hypothesis assumes the mean scores for males and females are equal. This leads to a formal statement of the null hypothesis as:

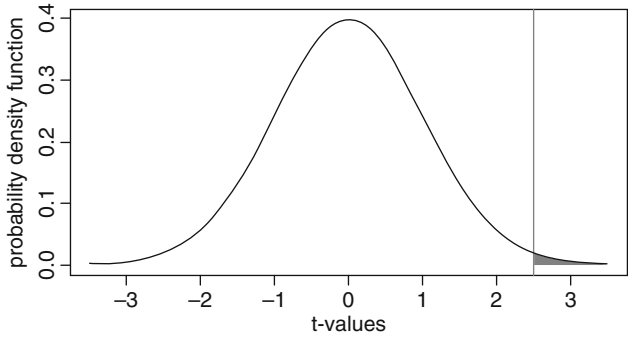
$$H_0 : \overline{X}_{male} = \overline{X}_{female}$$

Where $\overline{X}_{male}$ is the sample mean for males, and $\overline{X}_{female}$ is the sample mean for females.

Though the null provides a specific statement as to the value of the parameter of interest in the population, it is actually quite unlikely that any population value will exactly equal that set in the null hypothesis. Further, the value of the statistic calculated on any sample drawn from the population may vary from the population value due to chance factors (error). In order for us to be able to use our null hypothesis to make better statistical inferences, we need to capture this variation. To do so, we build sampling distributions for our test statistics.

A sampling distribution assigns probabilities to all possible values a test statistic may take in a sample. Probabilities are assigned based on the notion that *if the null hypothesis is true*, as we draw samples of a fixed size, any variation we observe should be due to random (error) variation. In the long run, this random variation should mean we are likely to see more values close to the population value and fewer values which fall a long way from the population value.

Figure 1 shows the theoretical sampling distribution for tests of mean difference, the *t*-distribution, under the null hypothesis that the means are equal across two groups, as is the case in the conscientiousness example. The area under the curve provides the probability for a given section



Null Hypothesis, Fig. 1 *t*-distribution (df=98) for the conscientiousness example

of the distribution. As can be seen in Fig. 1, the mass of this distribution centers on zero (no difference, the null), and as the *t*-values (x-axis) become larger in either a positive or negative direction, they are seen less frequently.

From this distribution the *p*-values for a given value of the test statistic can be determined. The grey vertical line in Fig. 1 indicates a *t*-value of 2.5 from our example. This has an associated *p*-value of 0.0141 (4 d.p.). What this value specifies is *the probability of observing a value at or more extreme than that observed, if the null hypothesis is true.* In Fig. 1, the "*at of more extreme*" is demonstrated by the shaded area. The *p*-value is the cumulative probability or all values to the right of the line, or the area of the shaded region. This interpretation of the *p*-value is important as it further demonstrates that the evaluation of the findings is based on the assumption that the null hypothesis is true.

Specifying the Null Hypothesis

In a large majority of statistical tests applied in personality and individual difference research, the null hypothesis specifies no effect. As is conventional, in the mean difference example presented above, the null was assumed to be zero or no difference between the groups. Similarly, for testing correlation coefficients the null is often specified such that there is no association. However, it is interesting to note that the etymology of the term "null hypothesis" is not what many assume. Null here does not refer to zero effect but was intended to refer to the process of nullifying, or falsifying, a hypothesis (Szucs and Ioannidis preprint).

There is no reason why our null hypothesis needs to specify population values to be zero. Our null hypothesis could be that a given statistic takes on any other *specific* value of our choosing; it is the specificity which is important. The selection of the null hypothesis should be theory driven. However, in practice, often theories are not specified with enough precision that it is possible to do so, and as a result, researchers often fall back on the "default" null hypothesis of no effect.

Hypothesis Testing and Making Inferences About the Null

Ultimately, the purpose of specification of the null hypothesis and associated sampling distributions is in hypothesis testing. In short, hypothesis testing frameworks provide rules by which we can evaluate the probabilities of the sample statistics calculated in research studies and as such allow researchers to draw inferences concerning the null hypothesis.

There are a variety of frameworks used for hypothesis testing. The current dominate framework, null hypothesis significance testing (NHST), represents an amalgam of two approaches developed in the early part of the twentieth century by Fisher (1925) and Neyman-Pearson (Neyman and Pearson 1933). Although these approaches differ in a number of ways, both have a central place for the null hypothesis as the hypothesis which is *actually tested* and in relation

to which subsequent evaluations of results are made (See ▶ "Hypothesis Testing").

There is currently much debate in the methodological literature as to whether NHST is a useful hypothesis testing framework (For critical discussions see Gigerenzer 2004; Szucs and Ioannidis preprint). However, even in competing hypothesis testing frameworks, specifically Bayesian and likelihood-based approaches, the null hypothesis remains a key concept. In both approaches, hypothesis testing is based on a comparison of multiple specifically stated models (or hypotheses), of which the null is one.

Conclusions

The null hypothesis is an important concept in the application of statistical procedures in scientific study. It has a central role in hypothesis testing, not only in NHST but also in other frameworks for making statistical inferences, in providing the reference to which our sample data can be compared. The null is specific, mathematically formulated, and theory driven. It is critical to statistical inference and hypothesis testing across multiple frameworks (see "▶ Hypothesis Testing").

Cross-References

▶ Hypothesis Testing

References

Fisher, R. (1925). *Statistical methods for research workers* (1st ed.). Edinburgh: Oliver and Boyd.

Gigerenzer, G. (2004). Mindless statistics. *The Journal of Socio-Economics, 33*, 587–606.

Hays, W. L. (1994). *Statistics* (5th ed.). Belmont: Wadsworth.

Neyman, J., & Pearson, E. S. (1933). On the problem of the most efficient tests of statistical hypotheses. *Philosophical Transactions of the Royal Society of London, Series A, 231*, 289–337.

Szucs, D., & Ioannidis, J. P. A. (2016). When null hypothesis significance testing is unsuitable for research: A reassessment. *bioRxiv*. https://doi.org/10.1101/095570.

Nurture

▶ Parental Influence on Personality Development (Adler)