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The Relationship Between Hypersexual Behavior, Sexual Excitation, Sexual Inhibition, and Personality Traits

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Abstract The term hypersexuality was introduced to describe excessive sexual behavior associated with a person's inability to control his or her sexual behavior. The main aim of the present study was to investigate the impact of different personality traits on the degree of hypersexual behavior as measured by the Hypersexual Behavior Inventory (HBI). A further aim was to evaluate the association between sexual inhibition and excitation [as described in the Dual Control Model (DCM)] and hypersexual behavior. A sample of 1,749 participants completed an internet-based survey comprised the HBI, the short form of the Sexual Inhibition/Sexual Excitation Scales (SIS/SES-SF) as well as more general personality measures: the Behavioral Inhibition System/Behavioral Activation System-scales (BIS/BAS-scales) and a short version of the Big Five Inventory (BFI-10). Using the recommended HBI cut-off, 6.0 % ($n = 105$) of the present sample could be categorized as hypersexual, which is comparable to the results of previous studies about the prevalence of hypersexual behavior in the general population. The results provided strong support for the components of the DCM—sexual excitation and inhibition—to explain hypersexual behavior, irrespective of gender and sexual orientation. Some of the general personality traits also showed significant relationships with hypersexual behavior. Taken together, the results of the present study provide further support for the relevance of research about the relationships between sexual problems and disorders, the DCM, and personality variables.

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Introduction

Excessive sexual behavior associated with a person's decreased ability to control his or her sexual behavior has a long history in research and clinical practice. In the nineteenth century, people who had problems controlling their sexual behaviors were characterized with labels such as satyriasis, nymphomania or Don Juanism (Levine, 2010). Some of the pioneers of sex research, von Krafft-Ebing (1893/2005) and Hirschfeld (1921/2012), clinically documented case studies about patients whose sexual behavior seemed excessive and led to personal distress and social problems. Since then, other types of clinical labels have been applied, including sexual addiction (Carnes, 1983), sexual compulsivity (Coleman, 1990), sexual desire dysregulation (Bancroft, 1999), and paraphilia-related disorder (Kafka, 1994; Kafka & Hennen, 1999).

Kafka (2010) proposed Hypersexual Disorder as a new psychiatric disorder for consideration in the sexual disorders section for the fifth revision of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5). According to this proposal, Hypersexual Disorder is described by the following five diagnostic criteria, which have to apply over a period of at least 6 months and be recurrent and intense enough to lead to clinically significant personal distress or impairment in social, occupational or other important areas of functioning (Kafka, 2010). In order to meet the proposed diagnostic threshold, an individual has to show at least four of the following five criteria:

1. Time consumed by sexual fantasies, urges or behaviors repetitively interferes with other important (non-sexual) goals, activities, and obligations.

2. Repetitively engaging in sexual fantasies, urges or behaviors in response to dysphoric mood states (e.g., anxiety, depression, boredom, or irritability).
3. Repetitively engaging in sexual fantasies, urges or behaviors in response to stressful life events.
4. Repetitive but unsuccessful efforts to control or significantly reduce these sexual fantasies, urges or behaviors.
5. Repetitively engaging in sexual behaviors while disregarding the risk for physical or emotional harm to self or others.

Recently, the American Psychiatric Association (2013) decided to decline the inclusion of the Hypersexual Disorder in the DSM-5. However, hypersexual behavior is nevertheless relevant in clinical practice and many research efforts have been undertaken to understand and treat patients who may not be able to control sexual behavior appropriately (e.g., Briken, Hill, & Berner, 2005; Kaplan & Krueger, 2010; Marshall & Briken, 2010; Rettenberger, Dekker, Klein, & Briken, 2013). Despite the long tradition of clinical descriptions and empirical research about hypersexual behavior in clinical samples as well as in the general population, there are still many uncertainties about the etiology and psychological correlates of hypersexual behavior (Bancroft & Vukadinovic, 2004; Walters, Knight, & Långström, 2011; Winters, Christoff, & Gorzalka, 2010).

One reason for these desiderata is that the above-mentioned diagnostic labels—including hypersexual behavior itself—are based frequently on atheoretical compilations of diagnostic criteria based on clinical observations. This reliance prevents an in-depth understanding of the etiology and developmental pathways of hypersexual behavior. The lack of theory-based considerations is in part due to the fact that not only research about hypersexual behavior but the majority of sex research in general is characterized by a lack of theory, and even if various theoretical models of relevance exist, they are seldom used (Bancroft, Graham, Janssen, & Sanders, 2009; Weis, 1998). Furthermore, even if hypersexual behavior is conceptualized on the basis of comprehensive theoretical models, the application of these models to the field of sexuality-related research and clinical practice lacks adequate empirical support. For example, the term sexual addiction points to the fact that some clinicians have observed and described similarities between substance-related addiction and sexual addiction (Briken et al., 2005; Carnes, 1983), but the transfer of an addiction-based theoretical model seems to be still premature (Kingston & Firestone, 2008).

In the present study, we tried to embed hypersexual behavior into a broader context of personality models and constructs which in turn were conceptually and empirically related to different kinds of sexuality-related behavior problems and dysfunctions: the Dual Control Model (DCM) of sexual behavior, the concepts of approach and avoidance, and the Big Five model of personality. In the following, we would like to present a brief overview about these models and concepts and explain why and how they could be relevant for an understanding of hypersexual behavior.

Dual Control Model

One of the most important theoretical developments in the last decades in the field of sex research was the introduction of the DCM (Bancroft & Janssen, 2000; Janssen & Bancroft, 1996). The DCM postulates that the degree of sexual arousal depends on the individual responsiveness of two distinct neurophysiological systems: sexual excitation and sexual inhibition (Bancroft, 1999). The internationally most common used and best psychometrically investigated instruments for measuring the individual propensities of sexual inhibition and excitation are the Sexual Inhibition/Sexual Excitations Scales (SIS/SES; Janssen, Vorst, Finn, & Bancroft [2002a, b]). This questionnaire contains three scales, one measuring Sexual Excitation (SES) and the other two measuring Inhibition Due to Threat of Performance Failure (SIS1) and Inhibition Due to Threat of Performance Consequences (SIS2). The developers of the DCM propose that individuals vary in their propensity for excitation and inhibition proneness and it is further postulated that excitatory and inhibitory responses are mostly adaptive and functional (Bancroft et al., 2009). This assumption is supported by the fact that research results have shown close to normal variability in sexual excitation and inhibition in both men and women (Carpenter, Janssen, Graham, Vorst, & Wicherts, 2008; Graham, Sanders, & Milhausen, 2006).

However, the DCM also makes predictions about dysfunctional and pathological conditions depending on particular manifestations of sexual excitation and inhibition (Bancroft et al., 2009; Bancroft & Vukadinovic, 2004). For example, it was postulated that individuals with a relatively low propensity for sexual excitation and at the same time a high propensity for sexual inhibition are more likely to experience problems of reduced sexual desire or impaired sexual response compared to individuals whose propensity for sexual excitation and inhibition lies within the normal range. On the other hand, individuals who have a high propensity for sexual excitation and a low propensity for sexual inhibition are more likely to show problems in terms of hypersexual behavior (Bancroft et al., 2009). More precisely, the likelihood of hypersexual behavior is particularly high in individuals with a combination of high SES and low SIS2 propensities (Bancroft & Vukadinovic, 2004).

Previous research at least partially supported these assumptions by providing evidence that hypersexual individuals scored higher on SES, whereas the relationship between sexual inhibition and hypersexual behavior was somewhat unclear (Bancroft et al., 2004; Bancroft, Janssen, Strong, Carnes, & Long, 2003; Bancroft & Vukadinovic, 2004; Winters et al., 2010). Indeed, some researchers reported a positive correlation between SIS1 and risky sexual behavior, safe sex assertiveness, and sexual sensation

seeking (e.g., Bancroft et al., 2003, 2004; Muise, Milhausen, Cole, & Graham, 2013; Nguyen et al., 2012). One possible explanation for this counterintuitive relationship could be that persons scoring high on SIS1 might engage in more risky and more sensationally experienced sexual behavior because of the fear of otherwise losing one's sexual arousal.

Approach and Avoidance

In recent years, the research interest in the impact of general personality traits on sexual problems and risky sexual behavior has substantially increased (Bancroft et al., 2009; Pinto, Carvalho, & Nobre, 2013). One of the oldest and to date still one of the most influential personality-based theories about motivation and emotion is the distinction between approach and avoidance dispositions (Elliot & Covington, 2001; Elliot & Trash, 2002). Elliot (2006) defined approach motivation as the energization of behavior by positive stimuli, whereas avoidance motivation can be defined as the energization of behavior by negative stimuli. Based on the seminal work of Gray (1970, 1982), researchers have proposed the existence of two conceptual nervous systems, the Behavioral Activation System (BAS) and the Behavioral Inhibition System (BIS), which describe individual differences in the propensities of approach and avoidance motivation (e.g., Brenner, Beauchaine, & Sylvers, 2005; Carver & White, 1994).

Trying to transfer this research perspective to the field of sex research, some authors suggested, first, that individuals use sexual activity usually to achieve certain goals and, second, that people can differ in the nature and quality of these goals and their underlying motivational structure (Cooper, Shapiro, & Powers, 1998). Third, the individual differences influence substantially the experiences and the expressions of sexual behavior (Cooper, Talley, Sheldon, Levitt, & Barber, 2008; Impett, Peplau, & Gable, 2005). The approach-avoidance model is regarded as the most fundamental dimension that distinguishes sexual behaviors related to approach (e.g., in order to achieve intimacy or enhancement) from sexual behaviors in support of avoidant goals (e.g., in order to avoid negative mood states or disapproval from others; Cooper et al., 2008). In general, approach goals are usually related to an increase of sexual activity, whereas avoidance goals frequently lead to reduced sexual interest and expression (Cooper et al., 1998; Impett et al., 2005).

Even if there are some theoretical similarities between the DCM and the more generally conceptualized activation-inhibition models, it is proposed that sexual and generally behavioral motivational systems work independently from each other (Bancroft et al., 2009; Rettenberger & Briken, 2013). In order to test this hypothesis, Janssen et al. (2002a) investigated the relationship between BIS/BAS and SIS/SES and predicted only modest correlations between the scales. Their predictions were confirmed, with the exception of a surprising finding of a positive correlation between BIS and SES. Carpenter et al. (2008) corroborated these findings and also reported only small to moderate relationships between BIS/BAS and SIS/SES that were generally slightly higher for men compared to women. Given the fact that previous research has documented a stable relationship between the propensity of BIS and BAS and sexual behavior (Cooper et al., 2008; Impett et al., 2005) as well as with different kinds of addictive behavior (e.g., Franken, 2002; Franken, Muris, & Georgieva, 2006; Pardo, Aguilar, Molinuevo, & Torrubia, 2007; Park et al., 2013), it can be hypothesized that hypersexual behavior is also related to general behavioral inhibition and activation systems.

The Big Five

Another popular approach to identify the basic structural dimensions of personality is the Big Five model, composed of Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness (McCrae & Costa, 1987). In the last two decades, several theorists have tried to find conceptual connections between the components of the Big Five model and the above-mentioned approach-avoidance concepts of personality (see, for example, Elliot & Trash, 2002, or Larsen & Augustine, 2008, for overviews). Specifically, stable positive relationships between Neuroticism and BIS (e.g., Ball & Zuckerman, 1990; Fruyt, van de Wiele, & van Heeringen, 2000) as well as between Extraversion and BAS (e.g., Carver & White, 1994; Gomez, Cooper, & Gomez, 2000) were reported. Together with previous findings about the relationships between common personality traits and addictive behavior in general (Coëffec, 2011; Terracciano & Costa, 2004; Zargar & Ghaffari, 2009), as well as risky sexual behavior and hypersexual behavior in particular (e.g., Pinto et al., 2013; Reid, Garos, & Carpenter, 2011a; Schmitt, 2004), the overlaps between these different personality theories (e.g., Elliot & Trash, 2002; Smillie, 2008) also indicate conceptual connections between the Big Five components and hypersexual behavior. For example, Neuroticism and Extraversion are usually positively related to approach or appetitive goals and to a higher sensitivity for reward cues, which leads to the assumption that these personality variables are particularly relevant for the explanation of sexual excitation and higher levels of hypersexual behavior (e.g., Cooper et al., 2008; Gray, 1970; Larsen & Ketelaar, 1991; Reid et al., 2011a; Smillie, 2008), whereas Agreeableness and Conscientiousness were usually deemed as negatively correlated with avoidant or aversive goals as well as with behavioral and sexual inhibition (e.g., Impett et al., 2005; Janssen et al., 2002a; Pinto et al., 2013; Reid et al., 2011a; Schmitt, 2004).

The Present Study

In the present study, our understanding and definition of hypersexual behavior was based on the proposed DSM-5 criteria for

Hypersexual Disorder (Kafka, 2010), which were also the theoretical and empirical basis for the development of the Hypersexual Behavior Inventory (HBI; Reid et al., 2011a). Beside an increase in definitional clarity, this conceptualization offers the opportunity to differentiate between hypersexual behavior in the narrowest sense of the term and sexually deviant behavior associated with other disorders (e.g., with neurological pathology, see Kafka, 1997). We formulated the following hypotheses:

Hypothesis 1: Hypersexual behavior, dimensionally measured using the HBI, is positively correlated with Sexual Excitation (SES) and negatively correlated with Sexual Inhibition Due to Threat of Performance Consequences (SIS2). According to previous studies which have investigated the relationship between Sexual Inhibition Due to Threat of Performance Failure (SIS1) and risky sexual behavior, safe sex assertiveness, and sexual sensation seeking (e.g., Bancroft et al., 2003, 2004; Muise et al., 2013; Nguyen et al., 2012), a significantly positive correlation between SIS1 and hypersexual behavior was expected.

Hypothesis 2: Hypersexual behavior is related to higher scores on BAS-related scales and lower scores on the BIS-scale. However, the relevance of the BIS/BAS-scales is weaker compared to SIS/SES which were developed particularly to predict sexual response patterns. Therefore, it was hypothesized that SIS/SES provide an incremental contribution beyond what was captured by BIS/BAS alone in the explanation of hypersexual behavior.

Hypothesis 3: Hypersexual behavior is related to lower levels of Agreeableness and Conscientiousness and higher levels of Neuroticism and Extraversion. However, like for the BIS/BAS-scales, it is assumed that the relationships between the Big Five personality dimensions and hypersexual behavior are weaker than the relationships between SIS/SES and hypersexual behavior. No significant relationship between Openness to Experience and hypersexual behavior was expected.

Given the discussion about differential effects of gender and sexual orientation on sexual arousal and behavior in general and on hypersexual behavior in particular (e.g., Briken, Habermann, Berner, & Hill, 2007; Janssen, 2011; Kafka, 2000; Klein, Rettenberger, & Briken, 2014; Långström & Hanson, 2006), we analysed the possible moderating effect of gender and sexual orientation on the relationship between the components of the DCM, sexual excitation and inhibition, and hypersexual behavior. Because previous studies have not yielded a clear pattern about these relationships and possible moderating effects (e.g., Bancroft et al., 2003; Muise et al., 2013), we refrained from formulating explicit hypotheses and decided to investigate the relationships in an explorative manner.

Method

Participants

The data of the present sample were collected by means of an online survey sent to 624 e-mail addresses of students' faculty councils from 49 German universities. Furthermore, the link was shared via social networks (e.g., Facebook). The study was approved by the ethics committee of the Hamburg Psychotherapist Chamber (Hamburg, Germany). The survey was accessed by 2,229 people between May 15, 2012 and June 15, 2012. The data of 458 persons (20.5 % of the initial sample) were excluded from further analyses because of missing data that precluded meaningful data analysis. Additionally, 22 participants (less than 0.01 % of the initial sample) had to be excluded because of obviously impossible and/or answer patterns suggesting faking (e.g., the stated age at first sexual intercourse was higher than current age).

Of the remaining sample ($N = 1{,}749$), 56.5 % ($n = 988$) were female, 42.9 % ($n = 750$) male, and 0.6 % ($n = 11$) described themselves as neither male nor female (e.g., transgender). The mean age at the time of participation was $M = 24.42$ (SD = 4.37, range 18–62). The majority of the sample were students (85.8 %, $n = 1{,}501$), 10.5 % ($n = 184$) were regularly employed, 1.5 % ($n = 26$) were unemployed, and 2.2 % ($n = 38$) indicated another employment status (e.g., other educational institution than university). More than half of the present sample (59.6 %, $n = 1{,}043$) were married, engaged, or lived with their partner at the time of the survey. Most of the participants (83.6 %, $n = 1{,}462$) described themselves as exclusively or predominantly heterosexual, 3.6 % ($n = 63$) as exclusively or predominantly homosexual, 4.2 % ($n = 73$) as bisexual, and 8.6 % ($n = 151$) described their sexual orientation with other labels or gave no answer to this question. Only a very small minority (4.0 %, $n = 70$) often or very often experienced problems with sexual functioning in the 6 months prior to survey participation.

Measures

The survey consisted of some single items about basic demographic and sexologic characteristics of the participants and the German version of the following standardized questionnaires: the Hypersexual Behavior Inventory (HBI; Reid et al., 2011a), the Sexual Inhibition/Sexual Excitation Scales-Short Form (SIS/SES-SF; Carpenter, Janssen, Graham, Vorst, & Wicherts, 2011), the Behavioral Inhibition System/Behavioral Activation System-scales (BIS/BAS-scales; Carver & White, 1994), and the 10-item short version of the Big Five Inventory (BFI-10; Rammstedt & John, 2007). Sexual orientation was measured dimensionally using

an adaptation of the Kinsey scale (Kinsey, Pomeroy, & Martin, 1948), ranging from 0 (exclusively heterosexual) to 4 (exclusively homosexual).

Hypersexual Behavior Inventory (HBI)

The HBI is a self-report measure and consists of 19 items allocated to three different factors: Control, Consequences, and Coping (Reid et al., 2011a). All items are rated on a five-point Likert format (1 = never to 5 = very often), with possible scores ranging from 19 to 95 points. The HBI includes items about the individual propensity of engaging in sexual behavior in response to stress or dysphoric mood states, as well as questions about previous unsuccessful attempts to control sexual behavior and potential impairments in different areas of functioning.

Previous research confirmed the 3-factorial structure of the HBI, supported its reliability and validity (Reid et al., 2011a; Reid, Carpenter, & Lloyd, 2009a; Reid, Harper, & Anderson, 2009b), and provided evidence for the clinical relevance of the measure (Reid, Garos, Carpenter, & Coleman, 2011b; Reid, Karim, McCrory, & Carpenter, 2010). The German translation of the HBI has also showed good reliability and validity (Klein, Rettenberger, Boom, & Briken, 2013a; Klein, Rettenberger, Turner, & Briken, 2013b). In the present study, the internal consistency of the HBI was $\alpha = .90$ and the mean total score was 33.90 (SD = 10.46, range 19–91).

Previous investigations recommended classifying respondents with HBI scores of 53 or above as hypersexual (Reid et al., 2011a). The authors proposed that individuals meeting this threshold experienced hypersexual behavior in a way that implicated clinically significant personal distress or impairment in important areas of functioning (Reid et al., 2011b). Using this cut-off score, 6.0 % ($n = 105$) of the present sample could be categorized as hypersexual, which is comparable to the results of previous studies about the prevalence of hypersexual behavior in the general population (Kafka, 2010; Kinsey et al., 1948; Långström & Hanson, 2006; Rettenberger et al., 2013).

Sexual Inhibition/Sexual Excitation Scales-Short Form (SIS/SES-SF)

The SIS/SES-Short Form (SIS/SES-SF) was designed by selecting items from the original 45-item version of the SIS/SES (Janssen et al., 2002a, b) that represented the three-factor structure equally well for women and men (Carpenter et al., 2008). This research yielded a 14-item short version that has similar psychometric properties for women and men. Correlations between the original SIS/SES and the new SIS/SES-SF (for SES $r = .90$, for SIS1 $r = .80$, and for SIS2 $r = .80$) showed that both versions obtained comparable results in most cases (Bancroft et al., 2009). Additionally, both versions exhibited similar test–retest reliability as well as convergent and discriminant validity (Carpenter et al., 2008). The German version of the SIS/SES-SF also showed good reliability and validity (Rettenberger & Briken, 2013; Turner, Briken, Klein, & Rettenberger, 2013). The internal consistency in the present study was $\alpha = .76$ for SES, $\alpha = .60$ for SIS1, and $\alpha = .66$ for SIS2. The mean total score for SES was 15.75 (SD = 3.14, range, 6–24), for SIS1 $M = 8.98$ (SD = 2.31, range, 4–16), and for SIS2 $M = 10.70$ (SD = 2.70, range, 4–16).

Behavioral Inhibition System/Behavioral Activation System-Scales (BIS/BAS-Scales)

The BIS/BAS-scales consist of 20 self-administered questions scored on a 4-point Likert scale from "totally agree" to "totally disagree". Seven items are allocated to the BIS scale and 13 items to the BAS total scale, which can further be subdivided into the following three subscales: Fun-Seeking (BAS-fun; four items), Reward Responsiveness (BAS-reward; five items), and Drive (BAS-drive; four items). The BIS/BAS-scales were also translated into German and yielded generally acceptable psychometric scores, although the German cross-validation study indicated only a two-factor-solution consisting of one BIS and one BAS factor (Strobel, Beauducel, Debener, & Brocke, 2001). In the present study, the mean total scores were 20.02 (SD = 3.03, range, 8–28) for BIS, $M = 11.48$ (SD = 2.12, range, 4–16) for BAS-fun, $M = 16.05$ (SD = 2.17, range, 4–16) for BAS-reward, and $M = 11.46$ (SD = 2.19, range, 4–16) for BAS-drive. The internal consistencies were $\alpha = .58$ for BIS, $\alpha = .78$ for the BAS total scale, $\alpha = .65$ for BAS-fun, $\alpha = .59$ for BAS-reward, and $\alpha = .74$ for BAS-drive.

Short Version of the Big Five Inventory (BFI-10)

The BFI-10 is a 10-item short version of the original Big Five Inventory (BFI-44), which consisted of 44 items rated on a 5-point Likert scale from "disagree strongly" to "agree strongly". The BFI-44 was also translated into German and had psychometric properties similar to the original version (Lang, Lüdtke, & Asendorpf, 2001). For the development of the 10-item short version, two BFI-items for each Big Five dimension (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness) were selected following predefined criteria (Rammstedt & John, 2007). In the developmental study, the first validation data indicated good test–retest reliability, convergent validity (as measured with correlations between the BFI-10 and the subscales of the NEO-PI-R; Costa & McCrae, 1992), and external validity using peer ratings (Rammstedt & John, 2007). In the present study, the mean total scores were 6.6 (SD = 2.10, range, 2–10) for Extraversion, $M = 6.36$ (SD = 1.61, range, 2–10) for Agreeableness, $M = 6.59$ (SD = 1.71, range, 2–10) for Conscientiousness, $M = 6.04$ (SD = 1.98, range, 2–10) for Neuroticism, and $M = 7.60$ (SD = 1.86, range, 2–10) for Openness. The internal consistency[1]

[1] Because there are only two items for each subscale, we additionally provided the correlation coefficients between these two items for each subscale.

of each subscale was for Extraversion $\alpha = .80$ ($r = .67$, $p < .001$), for Agreeableness $\alpha = .19$ ($r = .11$, $p < .001$), for Conscientiousness $\alpha = .52$ ($r = .34$, $p < .001$), for Neuroticism $\alpha = .64$ ($r = .47$, $p < .001$), and for Openness $\alpha = .54$ ($r = .39$, $p < .001$).

Statistical Analysis

All statistical analyses were performed using PASW Statistics 18.0 (SPSS Inc., Chicago, IL, USA). First, Pearson's correlations were calculated for all (sub-)scales. According to Cohen (1992), coefficients of 0.1 indicate a small effect, coefficients of 0.3 a medium effect, and coefficients of 0.5 and above are classified as large effects. Second, ANOVAs were calculated to compare the scores between individuals with a HBI total score of 53 or above and participants with lower HBI total scores. Cohen's *d*-values of 0.2 were classified as small, of 0.5 as medium, and of 0.8 as high (Cohen, 1992). Third, stepwise multiple regression analysis was used to determine the most effective predictors of dimensionally measured hypersexual behavior; that is, the dependent variable in this set of regression analysis was the total score of the HBI. In the fourth step, sequential multiple regression analysis was performed in order to test the possible moderating effects of gender and sexual orientation on the relationship between sexual excitation and inhibition and hypersexual behavior, by including interaction terms of the previously centered variables in the regression equations.

Results

Table 1 summarizes the zero-order correlations between hypersexual behavior, sexual excitation, sexual inhibition, behavioral activation and inhibition as well as the Big Five personality dimensions. Hypersexual behavior was significantly and positively correlated with the Sexual Excitation Scale (SES), the Fun Seeking-subscale of the Behavioral Activation System (BAS-FS), the Behavioral Inhibition System-subscale (BIS), and Neuroticism and showed negative correlations with Sexual Inhibition Due to Threat of Performance Consequences (SIS2), the drive-subscale of the Behavioral Activation System-scale (BAS-D), Extraversion, Agreeableness, and Conscientiousness.

Table 2 shows the differences in the personality variables between 105 individuals with a HBI total score of 53 or above and 1,644 participants with lower HBI scores. Individuals classified as hypersexual had significantly higher scores on sexual excitation and on the BAS-FS, as well as significantly lower scores on SIS2 and on Conscientiousness.

As can be seen in Table 3, the most important predictor of hypersexual behavior was SES, followed by Conscientiousness, Neuroticism, the fun-seeking-subscale of the BAS-FS, SIS1, SIS2, Extraversion, and the Reward Responsiveness-subscale of the BAS-scale (BAS-RR). Overall, 21.1 % (adjusted $R^2 = .207$) of the variance in hypersexual behavior was explained by these personality variables. While SES, Neuroticism, BAS-FS, and SIS1 were positively related to hypersexual behavior, Conscientiousness, SIS2, Extraversion, and BAS-RR were negatively related to hypersexual behavior. However, the relationships of Neuroticism, SIS1, SIS2, Extraversion, and BAS-RR with hypersexual behavior as measured with the HBI were generally quite small, with $rs \leq .10$.

In the next step of the data analysis, the incremental contribution of SIS/SES beyond the more general BIS/BAS scales was investigated. In the first block, the BIS/BAS scales were entered, followed by a second block with sexual excitation and both sexual inhibition factors. As hypothesized, the results in Table 4 show that the sexuality-specific SIS/SES provided an additional contribution to the explanation of hypersexual behavior over and above the BIS/BAS.

In the next step of the analyses, we investigated whether gender and sexual orientation moderate the relationship between sexual excitation/sexual inhibition and hypersexual behavior. Women showed significant lower scores than men on sexual excitation ($t[1,736] = -10.37$, $p < .001$, $d = .50$) and hypersexual behavior ($t[1,736] = -8.98$, $p < .001$, $d = .44$) and significant higher scores on both sexual inhibition dimensions (for SIS1 $t[1,736] = 13.84$, $p < .001$, $d = .67$ and for SIS2 $t[1,736] = 11.57$, $p < .001$, $d = .56$, respectively). The scores on the Kinsey scale were significantly positively correlated with hypersexual behavior ($r = .09$, $p < .001$) and sexual excitation ($r = .08$, $p < .001$), whereas between the Kinsey scale scores and the sexual inhibition dimensions no significant correlations were found (for SIS1: $r = .02$, $p = .379$, for SIS2: $r = -.05$, $p = .054$).

Table 5 shows the sequential multiple regression analysis with dimensionally measured hypersexual behavior as the dependent variable and gender, sexual inhibition and excitation as well as various interaction terms as independent variables. In the first block, only gender was entered, followed by a second block with gender as well as sexual excitation and both sexual inhibition factors. The increase of the proportion of explained variance between the first and the second block shows that the components of the DCM are significant predictors of hypersexual behavior beyond the explanation of variance captured by gender alone. Gender, SES, and SIS1 were positively related to hypersexual behavior, meaning that male participants showed higher HBI scores and that higher scores on SES and SIS1 were related to higher HBI scores, whereas SIS2 showed a negative relationship with the HBI scores which means that the lower the SIS2 scores, the higher the propensity of hypersexual behavior measured by the HBI. In the third block, interaction terms between sexual excitation, sexual inhibition due to threat of performance failure, sexual inhibition due to threat of performance consequences and hypersexual behavior were included. None of the interaction terms reached statistical significance, indicating gender did not moderate the association between sexual excitation, sexual inhibition, and hypersexual behavior. In other words, the previously reported relationship between sexual excitation, sexual inhibition,

Table 1 Zero-order correlations between hypersexual behavior, sexual inhibition and excitation, behavioral inhibition and activation, and the Big Five personality traits

Measure	HBI	SES	SIS1	SIS2	BAS-D	BAS-FS	BAS-RR	BIS	EXTRA	AGREE	NEURO	CONSC	OPEN
HBI	–	.39**	.04	−.13**	−.09**	.17**	.01	.06*	−.06*	−.05*	.07*	−.22**	−.03
SES		–	−.04	−.17**	.00	.20**	.14**	.03	.01	−.02	−.01	−.12	.04
SIS1			–	.37**	.09**	−.03	.11**	.26**	−.04	.04	.21**	.10**	.00
SIS2				–	.08*	−.14**	.05*	.20**	−.06*	−.01	.16**	.15**	.04
BAS-D					–	.27**	.52**	.01	.31**	−.01	−.04	.44**	.12**
BAS-FS						–	.37**	−.10**	.33**	.04	−.17**	−.12**	.17**
BAS-RR							–	.21**	.27**	.06*	.06*	.19**	.19**
BIS								–	−.16**	.06*	.60**	.00	.03
EXTRA									–	.12**	−.20**	.14**	.17**
AGREE										–	−.02	.07**	.03
NEURO											–	.01	.03
CONSC												–	.07*
OPEN													–

HBI Hypersexual Behavior Inventory, *SES* Sexual Excitation Scale, *SIS1* Sexual Inhibition Due to Threat of Performance Failure Scale, *SIS2* Sexual Inhibition Due to Threat of Performance Consequences Scale, *BAS-D* BAS-subscale Drive, *BAS-FS* BAS-subscale Fun Seeking, *BAS-RR* BAS-subscale Reward Responsiveness, *EXTRA* Extraversion, *AGREE* Agreeableness, *CONS* Conscientiousness, *NEURO* Neuroticism, *OPEN* Openness

* $p < .05$; ** $p < .001$

and hypersexual behavior applies to women and men in a similar way.

A quite similar pattern was found for sexual orientation. Table 6 shows the sequential multiple regression analysis predicting hypersexual behavior by sexual orientation, sexual inhibition, sexual excitation, and interaction terms between sexual inhibition, excitation, and sexual orientation. Again, SES and SIS1 were positively and SIS2 negatively related to hypersexual behavior. Sexual orientation showed a positive but small relationship with the HBI indicating that the higher the score on the Kinsey scale (i.e., the more homosexually oriented), the higher the degree of hypersexual behavior. As for gender, sexual orientation did also not serve as a moderator between sexual inhibition, sexual excitation, and hypersexual behavior, i.e., the examined impact of sexual excitation and sexual inhibition on hypersexual behavior was due to heterosexual as well as homosexual participants.

Discussion

Sexual Excitation and Inhibition

The main aim of the present study was to investigate whether hypersexual behavior measured dimensionally by the Hypersexual Behavior Inventory (HBI) could be predicted by the components of the DCM, sexual excitation and inhibition, by general behavioral activation and inhibition variables, as well as by common personality traits derived from the Big Five personality model. The first hypothesis was that hypersexual behavior should be strongly positively correlated with the SES and to a somewhat lower extent positively correlated with SIS1. Furthermore, a significantly negative correlation between hypersexual behavior and SIS2 was expected. The results provide strong support for these hypothesized relationships, particularly for sexual excitation. First, the correlation between sexual excitation and hypersexual behavior was by far the highest, with a moderate to large effect size. Second, sexual excitation was identified as by far the most important predictor of hypersexual behavior in the stepwise multiple regression analysis. Third, individuals classified as hypersexual according to their HBI total score of 53 or above (Reid et al., 2011b) showed significantly higher scores on SES than participants with lower HBI total scores.

The prominent role of sexual excitation in the explanation of hypersexual behavior was indicated in previous studies. For example, Muise et al. (2013) examined the relationship between sexual excitation and inhibition and sexual compulsivity in a sample of heterosexual married adults using different subscales from the Sexual Excitation/Sexual Inhibition Inventory for Women and Men (SESII-W/M; Milhausen, Graham, Sanders, Yarber, & Maitland, 2008) and the Sexual Compulsivity Scale (SCS; Kalichman & Rompa, 1995). Higher scores on sexual excitation were associated with higher levels of sexual compulsivity in both men and women. Furthermore, sexual excitation was by far the most important predictor of SCS scores (Muise et al., 2013).

In current research the question whether hypersexual behavior can be understood as expression of high sexual desire was discussed (Steele, Staley, Fong, & Prause, 2013; Winters et al., 2010). Winters et al. have hypothesized that dysregulated sexuality—a more general term for sexual compulsivity, sexual addiction, sexual impulsivity, and hypersexual behavior—is simply an

Table 2 Differences between individuals regarded as hypersexual as defined by an HBI Score of 53 or above ($n = 105$) and individuals with lower HBI Scores ($n = 1{,}644$)

	HBI ≥ 53 *M* (SD)	HBI < 53 *M* (SD)	Comparison	Effect size (*d*)
SES	17.92 (2.86)	15.29 (3.09)	$F(1, 1{,}747) = 72.48^{**}$	−.86
SIS1	9.01 (2.16)	8.98 (2.33)	$F(1, 1{,}747) = .02$	−.01
SIS2	9.76 (2.58)	10.76 (2.69)	$F(1, 1{,}747) = 13.55^{**}$	.37
BAS-D	11.25 (2.36)	11.48 (2.18)	$F(1, 1{,}747) = 1.08$	.11
BAS-FS	12.23 (2.30)	11.43 (2.10)	$F(1, 1{,}747) = 13.98^{**}$	−.38
BAS-RR	16.18 (2.38)	16.04 (2.15)	$F(1, 1{,}747) = .40$	−.07
BIS	20.55 (3.39)	19.98 (3.00)	$F(1, 1{,}747) = 3.49$	−.19
EXTRA	6.67 (2.35)	6.67 (2.08)	$F(1, 1{,}747) = .00$	.00
AGREE	6.17 (1.67)	6.38 (1.61)	$F(1, 1{,}747) = 1.58$	.13
NEURO	6.40 (2.17)	6.02 (1.97)	$F(1, 1{,}747) = 3.70$	−.19
CONSC	5.59 (1.73)	6.65 (1.69)	$F(1, 1{,}747) = 39.00^{**}$	.63
OPEN	7.67 (1.90)	7.59 (1.86)	$F(1, 1{,}747) = .17$	−.04

HBI Hypersexual Behavior Inventory, *SES* Sexual Excitation Scale, *SIS1* Sexual Inhibition Due to Threat of Performance Failure Scale, *SIS2* Sexual Inhibition Due to Threat of Performance Consequences Scale, *BAS-D* BAS-subscale Drive, *BAS-FS* BAS-subscale Fun Seeking, *BAS-RR* BAS-subscale Reward Responsiveness, *EXTRA* Extraversion, *AGREE* Agreeableness, *CONS* Conscientiousness, *NEURO* Neuroticism, *OPEN* Openness

$^{*}p < .05$; $^{**}p < .001$

indicator of elevated sexual desire in conjunction with the distress which is based on these increased sexual thoughts, feelings, and needs. They examined a large sample of more than 14,000 participants, some of whom had sought treatment because of dysregulated sexuality symptoms. The authors found that for the total sample as well as for different subsamples (e.g., participants who have sought treatment vs. those, who have not) dysregulated sexuality was systematically associated with increased sexual desire. Furthermore, factor analytical investigations were conducted which indicated that variables measuring dysregulated sexuality loaded together with items capturing the degree of sexual desire onto a single underlying factor. Winters et al. concluded that the results support their hypothesis of dysregulated sexuality as an expression of an increased sexual desire and, at the same time, challenge the view of hypersexual behavior as a distinct phenomenon because the conceptualisation as a disorder would make only sense if the construct is empirically and theoretically more than only high sexual desire (Winters, Christoff, & Gorzalka, 2009). Steele et al. (2013) confirmed this point of view by providing neurophysiological data where individuals who self-identified as having problems with regard to sexual self-regulation viewed sexual and non-sexual visual stimuli while electroencephalography data were collected. Because larger P300 amplitude differences to pleasant sexual stimuli were only negatively related to measures of sexual desire but not to measures of hypersexual behavior, the authors concluded that hypersexual behavior should be interpreted as an expression of high desire rather than a sexual disorder. Building on the findings reported by Winters et al. (2009, 2010) and and considering the conceptual similarities between high sexual desire and increased sexual excitation, the results of the present study could be interpreted as an additional indicator for the remarkable importance of increased sexual excitation as represented in the construct of high sexual desire in the explanation of hypersexual behavior and put further the conceptualization of hypersexual behavior as a distinct psychopathological category into question.

In the previous reported studies conducted by Winters et al. (2010) and Muise et al. (2013), sexual compulsivity and increased sexual desire were related to lower scores on sexual inhibition. Winters et al. used only SIS2 in their study which was significantly negatively correlated with all measures of sexual desire as well as with sexual compulsivity. Muise et al. examined the role of two different components of sexual inhibition for the prediction of SCS-scores by extracting two subscales of the SESII-W/M, Inhibitory Cognitions and Relationship Importance. Different results for men and women were identified: For women, sexual compulsivity was negatively correlated with Relationship Importance; however, they found no significant correlation between SCS-scores and Inhibitory Cognitions in the female subsample. Furthermore, for men, Inhibitory Cognitions were positively correlated with sexual compulsivity, whereas Relationship Importance showed again the hypothesized negative association with sexual compulsivity (Muise et al., 2013). The negative or missing relationship between Inhibitory Cognitions and SCS-scores is counterintuitive but confirms previous empirical findings about the relationship between sexual inhibition, risky sexual behavior and sexual sensation seeking (Bancroft et al., 2003; Nguyen et al., 2012). A possible explanation for this relationship could be that persons who are prone to inhibition due to performance failure might engage in more risky and more sensationally

Table 3 Stepwise multiple regression analysis examining the relationship between hypersexual behavior and sexual inhibition and excitation, behavioral inhibition and activation, and the Big Five personality traits

	Variable	R^2 (adjusted R^2)	*b*	SE *b*	*β*
Step 1		.153 (.152)			
	SES		1.30	0.07	.39**
Step 2		.184 (.183)			
	SES		1.24	0.07	.37**
	Conscientiousness		−1.09	0.13	−.18**
Step 3		.190 (.189)			
	SES		1.24	0.07	.37**
	Conscientiousness		−1.09	0.13	−.18**
	Neuroticism		0.41	0.11	.08**
Step 4		.198 (.196)			
	SES		1.18	0.07	.36**
	Conscientiousness		−1.04	0.13	−.17**
	Neuroticism		0.49	0.12	.09**
	Fun seeking		0.45	0.11	.09**
Step 5		.201 (.199)			
	SES		1.19	0.07	.36**
	Conscientiousness		−1.07	0.13	−.18**
	Neuroticism		0.42	0.12	.08**
	BAS-FS		0.44	0.11	.09**
	SIS1		0.26	0.10	.06*
Step 6		.206 (.203)			
	SES		1.15	0.07	.35**
	Conscientiousness		−1.03	0.13	−.17**
	Neuroticism		0.45	0.12	.09**
	BAS-FS		0.41	0.11	.08**
	SIS1		0.38	0.11	.08**
	SIS2		−.31	0.09	−.08*
Step 7		.209 (.206)			
	SES		1.14	0.07	.34**
	Conscientiousness		−0.97	0.14	−.16**
	Neuroticism		0.41	0.12	.08**
	BAS-FS		0.50	0.12	.10**
	SIS1		0.38	0.11	.08**
	SIS2		−0.31	0.09	−.08*
	Extraversion		−0.28	0.12	−.06*
Step 8		.211 (207)			
	SES		1.16	0.07	.35**
	Conscientiousness		−0.90	0.14	−.15**
	Neuroticism		0.45	0.12	.08**
	BAS-FS		0.59	0.12	.12**
	SIS1		0.39	0.11	.09**
	SIS2		−0.30	0.09	−.08*
	Extraversion		−0.25	0.12	−.05*
	BAS-RR		−0.24	0.12	−.05*

Included variables showed an independent contribution beyond previously entered variables

SES Sexual Excitation Scale, *SIS1* Sexual Inhibition Due to Threat of Performance Failure Scale, *SIS2* Sexual Inhibition Due to Threat of Performance Consequences Scale, *BAS-FS* BAS-subscale Fun Seeking, *BAS-RR* BAS-subscale Reward Responsiveness

* $p < .05$; ** $p < .001$

Table 4 Sequential multiple regression analysis examining the incremental contribution of sexual inhibition and excitation beyond behavioral inhibition and activation in the prediction of hypersexual behavior

Variable	Change		Regression coefficient		
	R^2 change	F change	b	SE b	β
Block 1	.052	23.97**			
BIS			0.29	0.09	.08*
BAS-D			−0.66	0.13	−.14**
BAS-FS			1.07	0.13	.22**
BAS-RR			−0.06	0.14	−.01
Block 2	.137	98.13**			
BIS			0.25	0.08	.07*
BAS-D			−0.43	0.12	−.09*
BAS-FS			0.69	0.12	.14**
BAS-RR			−0.30	0.13	−.06*
SES			1.20	0.08	.36**
SIS1			0.39	0.11	.09**
SIS2			−0.33	0.09	−.09**

Included variables showed an independent contribution beyond previously entered variables

BAS-D BAS-subscale Drive, *BAS-FS* BAS-subscale Fun Seeking, *BAS-RR* BAS-subscale Reward Responsiveness, *SES* Sexual Excitation Scale, *SIS1* Sexual Inhibition Due to Threat of Performance Failure Scale, *SIS2* Sexual Inhibition Due to Threat of Performance Consequences Scale

* $p < .05$; ** $p < .001$

Table 5 Sequential multiple regression analysis predicting hypersexual behavior with gender, sexual inhibition and excitation, and interactions between these variables

Variable	Change		Regression coefficient		
	R^2 change	F change	b	SE b	β
Block 1	.048	87.68**			
Gender			3.74	0.40	.22**
Block 2	.135	96.21**			
Gender			2.49	0.40	.15**
SES			1.16	0.08	.35**
SIS1			0.54	0.11	.12**
SIS2			−0.31	0.09	−.08*
Block 3	.003	1.96			
Gender			2.50	0.43	.15**
SES			1.15	0.08	.35**
SIS1			0.54	0.11	.12**
SIS2			−0.32	0.09	−.08**
Gender × SES			0.04	0.13	.01
Gender × SIS1			0.32	0.17	.04
Gender × SIS2			0.17	0.17	.02

Included variables showed an independent contribution beyond previously entered variables

SES Sexual Excitation Scale, *SIS1* Sexual Inhibition Due to Threat of Performance Failure Scale, *SIS2* Sexual Inhibition Due to Threat of Performance Consequences Scale

* $p < .05$; ** $p < .001$

experienced sexual behavior because of the fear of otherwise losing one's sexual arousal. Thus, sexual sensation seeking and an increase in risky sexual behavior could be interpreted as a form of behavioral self-medication, in order to avoid the experience of repeated sexual performance failure.

The results of the present study support these previous findings about the relationships between the different components of sexual inhibition and dysregulated sexuality and problematic sexual behavior. Sexual inhibition due to performance consequences showed a weak but stable negative association with hypersexual behavior, whereas proneness to sexual inhibition due to performance failure was a significant but weak predictor of hypersexual behavior in the regression model. Comparable to the above-mentioned findings about the relationships between risky sexual behavior, sexual sensation seeking, and SIS1, the positive correlation between hypersexual behavior and SIS1 could be interpreted as another kind of self-treatment of the fear of sexual performance failure.

In order to trying to avoid further negative experiences about sexual performance failure, hypersexual behavior might be used as a maladaptive coping strategy. Kafka (2010) as well as Reid et al. (2011a) defined hypersexual behavior among others with an individual's propensity of engaging in sexual behavior in response to stress or dysphoric mood states (Schultz, Hook, Davis, Penberthy, & Reid, 2014). The underlying reason of this stress is initially not relevant for the diagnostic process (see, for example, the proposal of the DSM-5 criteria for hypersexual disorder; Kafka, 2010), so it could be assumed that stress triggered by sexual performance failure experiences might serve as one concrete source of stress and of a dysphoric mood state which leads to hypersexual behavior.

Another possible explanation for this result could be that hypersexual individuals need more stimulation in terms of risky sexual behavior to be sexually aroused, that is, excessive sexual behavior could be used to counteract sexual performance failure. A further reason for this finding is suggested by DSM-5 field trials about the prevalence and manifestations of hypersexual behavior which showed that pornography consumption (usually accompanied by masturbation) was the most prevalent expression of hypersexual behavior (Reid et al., 2012). Therefore, it could be hypothesized that individuals are engaging in (solo) hypersexual behavior like excessive masturbation and pornography use because of anxiety and refusal of relational sexual activity due to performance failure concerns.

A further aim of the present study was to investigate whether the influence of sexual excitation and inhibition on hypersexual behavior differs systematically as a function of gender and sexual orientation. For example, Muise et al. (2013) reported that gender

Table 6 Sequential multiple regression analysis predicting hypersexual behavior with sexual orientation, sexual inhibition and excitation, and interactions between these variables

Variable	Change		Regression coefficient		
	R^2 change	F change	b	SE b	β
Block 1	.009	13.92**			
Sexual orientation			0.97	0.26	.09**
Block 2	.162	105.20**			
Sexual orientation			0.57	0.24	.05*
SES			1.26	0.08	.38**
SIS1			0.40	0.11	.09**
SIS2			−0.38	1.00	−.10*
Block 3	.000	0.29			
Sexual orientation (SO)			0.57	0.24	.05*
SES			1.26	0.08	.38**
SIS1			0.40	0.11	.09**
SIS2			−0.38	1.00	−.10*
SO × SES			−0.04	0.07	−.01
SO × SIS1			−0.08	0.12	−.02
SO × SIS2			−0.02	0.10	−.01

Included variables showed an independent contribution beyond previously entered variables

SES Sexual Excitation Scale, *SIS1* Sexual Inhibition Due to Threat of Performance Failure Scale, *SIS2* Sexual Inhibition Due to Threat of Performance Consequences Scale, *SO* Sexual Orientation

* $p < .05$; ** $p < .001$

moderated the relationship between sexual inhibition and sexual compulsivity: For women, sexual compulsivity was not significantly related to the Inhibitory Cognitions subscale of the SESII-W/M, whereas for men, Inhibitory Cognitions were positively correlated with the scores on the SCS. From a theoretical point of view, representatives of the DCM would propose that the propensity of sexual excitation and inhibition per se would be more important than gender (Janssen & Bancroft, 2007). Even if previous studies found small but stable differences, for example, between women and men in the degree of sexual excitation and inhibition (e.g., Bancroft et al., 2009; Carpenter et al., 2008), proponents of the DCM would assume that the variability of sexual excitation and inhibition within women and men is higher—and therefore psychologically more relevant—than between both sexes (Janssen & Bancroft, 2007; Rettenberger & Briken, 2013).

The same conclusion can be drawn with regard to the relationship between sexual orientation and the components of the DCM: Even if there is some empirical evidence for significant differences in the propensities of sexual excitation and inhibition between groups with different sexual orientations (e.g., between heterosexual and homosexual men; Bancroft, Carnes, Janssen, & Long, 2005), the propensities of sexual excitation and inhibition should be more important than the classification into sexual orientation categories.

In order to examine these assumptions, a possible moderating effect of gender and sexual orientation on the relationship between sexual excitation and inhibition and hypersexual behavior was analyzed in the present study. In contrast to Muise et al. (2013), there were no significant interactions between sexual excitation and inhibition with gender and sexual orientation. These results can be also interpreted as a further support for the conceptual foundation of the DCM and its assumptions and implications (Bancroft et al., 2009; Janssen & Bancroft, 2007).

The differences in the results between the present study and the study published by Muise et al. (2013) might be explained at least to some extent by sample differences. Muise et al. used a sample of heterosexual, married adults who were recruited from an electronic mailing list of an internet-based sexual enhancement product company because they had previously purchased sexual enhancement products. Also, the Muise et al. (2013) sample was on average substantially older than the sample of the present study. Different measures were used as well: subscales of the SESII-W/M in the study of Muise et al. versus SIS/SES-SF in the present study.

Approach and Avoidance

We expected that hypersexual behavior was related to higher scores on BAS-related scales as well as to lower scores on the BIS-scale. The results indicate that our expectation was only supported for the Fun Seeking-subscale of the BAS (BAS-FS). The BAS-FS-scores were significantly positively correlated with hypersexual behavior, indicating that a higher propensity of fun seeking is weakly related to hypersexual behavior. Similarly, persons classified as hypersexual due to their HBI total score had significantly higher scores on BAS-FS than individuals with lower scores.

In consideration of the stable relationship between BIS and BAS and different kinds of addictive behavior (e.g., Franken, 2002; Franken et al., 2006; Pardo et al., 2007; Park et al., 2013), the relationship between the BAS-FS and sexual addiction-like behavior seems to be self-evident. Further support for the relevance of more general activation and inhibition mechanisms on sexual behavior can be derived from psychophysiological studies about sexual risk taking behavior (Janssen, Goodrich, Petrocelli, & Bancroft, 2009) and from conceptual similarities between the constructs of fun-seeking, general and sexual sensation seeking, and hypersexual behavior (Kalichman & Rompa, 1995; Winters et al., 2010; Zuckerman, 1994, 2007).

In line with our expectations, the relevance of the BAS-FS was lower compared to sexual excitation and inhibition as indicated by the regression coefficients. However, contrary to our hypothesis, the other BAS-subscales as well as the BIS-scale provide no significant additional association with hypersexual behavior beyond the other personality constructs. In line with conceptual assumptions about the DCM (Bancroft et al., 2009; Bancroft & Janssen, 2000; Janssen et al., 2002a), the sequential regression

analysis show that SIS/SES yielded an independent explanatory value over and above BIS/BAS, supporting the hypothesis that the two systems are distinct. Furthermore, these findings provide additional support for the development of sexuality-specific constructs and measures.

Big Five

We also hypothesized that hypersexual behavior was associated with lower levels of Agreeableness and Conscientiousness and higher levels of Neuroticism and Extraversion. No significant relationship was expected between Openness to Experience and hypersexual behavior. The intercorrelations confirmed these assumptions, with the exception of the suggested relationship between Extraversion and hypersexual behavior.

However, the correlation between Neuroticism and hypersexual behavior found in the present study was substantially lower than the results of previous studies would indicate. For example, Reid et al. (2011a) investigated the relationships between different facets of Neuroticism (e.g., anxiety, depression, or vulnerability) and hypersexual behavior and reported correlations that were considerably higher than in the present study. Possible reasons for these inconsistent results could be differences in the sample composition (Reid et al. recruited treatment-seeking patients, whereas the participants in the present study were recruited from the general population) and/or in the selection of different measures (the NEO-PI-R in Reid et al. vs. the BFI-10 in the present investigation).

One reason for the missing association between Extraversion and hypersexual behavior might be that we did not investigate which kind of sexual behavior lay behind the self-experienced hypersexual behavior. Because authors of previous studies have suggested that there is a distinction between dyadic and solitary sexual desire (e.g., Spector, Carey, & Steinberg, 1996)—a distinction which might be of particular interest when investigating dysregulated sexuality (e.g., Reid et al., 2012; Winters et al., 2010)—one possible explanation could be that, for example, higher Extraversion is particularly related to increased dyadic sexual desire, whereas a lower propensity of Extraversion would lead rather to increased solitary sexual desire.

Limitations

The current study has several limitations. First, the internal consistencies of the BFI-10-subscales were relatively low. Even if Cronbach's α depends substantially on the number of scale items, the value for the subscale Agreeableness in particular was obviously too low for meaningful interpretation. Second, online surveys can suffer generally from methodological problems which could limit the informative value of a scientific investigation (Blank, Fielding, & Lee, 2008). Winters et al. (2010) pointed out that exclusively internet-based samples usually consist of relatively young, urban, and sexually liberal participants. In the present sample, a comparatively high number of participants had a higher than average education, which leads to limitations in the generalizability of the present findings. In addition, sexual activity and frequency is influenced by age, so younger participants are probably more sexual active than older individuals (Laumann, Gagnon, Michael, & Michaels, 1994). The present sample consisted of a large number of college students at young age, so the results need to be interpreted with caution. However, even if there is until now no direct scientific evidence that the data of exclusively internet-based surveys about sexual experience and behavior can be transferred to the classic paper-and-pencil design (Winters et al., 2010), there is some evidence that internet-based data collections are commonly able to produce generalizable results (Best, Krueger, Hubbard, & Smith, 2001).

Despite these limitations, the findings of the present study contribute to the knowledge about the relationships between sexual excitation, sexual inhibition, and the personality-related proneness to hypersexual behavior. Even if it is obvious that sexually dysregulated behavior cannot be explained by personality variables alone, the results of the present study provide further support for the relevance of research on the relationships between sexual problems, sexual disorders, and personality (Bancroft et al., 2009). Furthermore, the present findings indicate that elevated sexual desire—as, for example, measured by high scores on SES—is clearly a particularly relevant variable for the explanation of hypersexual behavior, but additional risk factors and circumstances must be considered in order to provide a comprehensive model of hypersexual behavior.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Ball, S. A., & Zuckerman, M. (1990). Sensation seeking, Eysenck's personality dimensions and reinforcement sensitivity in concept formation. *Personality and Individual Differences, 11*, 343–353. doi:10.1016/0191-8869(90)90216-E.

Bancroft, J. (1999). Central inhibition of sexual response in the male: A theoretical perspective. *Neuroscience and Biobehavioral Reviews, 23*, 763–784. doi:10.1016/S0149-7634(99)00019-6.

Bancroft, J., Carnes, L., Janssen, E., & Long, J. S. (2005). Erectile and ejaculatory problems in gay and heterosexual men. *Archives of Sexual Behavior, 34*, 285–297. doi:10.1007/s10508-005-3117-7.

Bancroft, J., Graham, C. A., Janssen, E., & Sanders, S. A. (2009). The dual control model: Current status and future directions. *Journal of Sexual Research, 46*, 121–142. doi:10.1080/00224490902747222.

Bancroft, J., & Janssen, E. (2000). The dual control model of male sexual response: A theoretical approach to centrally mediated erectile dysfunction. *Neuroscience and Biobehavioral Reviews, 24*, 571–579. doi:10.1016/S0149-7634(00)00024-5.

Bancroft, J., Janssen, E., Carnes, L., Strong, D. A., Goodrich, D., & Long, J. S. (2004). Sexual activity and risk taking in young heterosexual men: The relevance of personality factors. *Journal of Sex Research, 41*, 181–192. doi:10.1080/00224490409552226.

Bancroft, J., Janssen, E., Strong, D., Carnes, L., & Long, J. S. (2003). Sexual risk taking in gay men: The relevance of sexual arousability, mood, and sensation seeking. *Archives of Sexual Behavior, 32*, 555–572. doi:10.1023/A:1026041628364.

Bancroft, J., & Vukadinovic, Z. (2004). Sexual addiction, sexual compulsivity, sexual impulse disorder or what? Towards a theoretical model. *Journal of Sex Research, 41*, 225–234. doi:10.1080/00224490409552230.

Best, S. J., Krueger, B., Hubbard, C., & Smith, A. (2001). An assessment of the generalizability of internet surveys. *Social Science Computer Review, 19*, 131–145. doi:10.1177/089443930101900201.

Blank, G., Fielding, N. G., & Lee, R. M. (2008). *The SAGE handbook of online research methods*. London: Sage Publications.

Brenner, S. L., Beauchaine, T. P., & Sylvers, P. D. (2005). A comparison of psychopysiological and self-report measures of BAS and BIS activation. *Psychophysiology, 42*, 108–115. doi:10.1111/j.1469-8986.2005.00261.x.

Briken, P., Habermann, N., Berner, W., & Hill, A. (2007). Diagnosis and treatment of sexual addictions: A survey among German sex therapists. *Sexual Addiction & Compulsivity, 14*, 131–143. doi:10.1080/10720160701310450.

Briken, P., Hill, A., & Berner, W. (2005). Sexuelle Sucht: Diagnostik, Ätiologie, Behandlung [Sexual addiction: Diagnosis, etiology, treatment]. *Zeitschrift für Sexualforschung, 18*, 185–197. doi:10.1055/s-2005-836639.

Carnes, P. (1983). *Out of the shadows: Understanding sexual addiction*. Center City, MN: Hazelton.

Carpenter, D., Janssen, E., Graham, C. A., Vorst, H., & Wicherts, J. (2008). Women's scores on the Sexual Inhibition/Sexual Excitation Scales (SIS/SES): Gender similarities and differences. *Journal of Sex Research, 45*, 36–48. doi:10.1080/00224490701808076.

Carpenter, D., Janssen, E., Graham, C. A., Vorst, H., & Wicherts, J. (2011). The Sexual Inhibition/Sexual Excitation Scales-Short Form. In T. D. Fisher, C. M. Davis, W. L. Yarber, & S. L. Davis (Eds.), *Handbook of sexuality-related measures* (pp. 236–239). Abingdon: Routledge.

Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS Scales. *Journal of Personality and Social Psychology, 67*, 319–333. doi:10.1037/0022-3514.67.2.319.

Coëffec, A. (2011). Les apports du modèle des cinq grands facteurs dans le domaine de l'alcoolodépendance [Big five factor contributions to addiction to alcohol]. *L'Encéphale, 37*, 75–82. doi:10.1016/j.encep.2010.03.006.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155–159. doi:10.1037/0033-2909.112.1.155.

Coleman, E. (1990). The obsessive-compulsive model for describing compulsive sexual behavior. *American Journal of Preventive Psychiatry and Neurology, 2*, 9–14.

Cooper, M. L., Shapiro, C. M., & Powers, A. M. (1998). Motivations for sex and risky sexual behavior among adolescents and young adults: A functional perspective. *Journal of Personality and Social Psychology, 75*, 1528–1558. doi:10.1037/0022-3514.75.6.1528.

Cooper, M. L., Talley, A., Sheldon, M. S., Levitt, A., & Barber, L. (2008). A dyadic perspective on approach and avoidance motives for sexual behavior. In A. J. Elliot (Ed.), *Handbook of approach and avoidance motivation* (pp. 615–631). New York: Psychology Press.

Costa, P. T., & McCrae, R. R. (1992). *NEO-PI-R professional manual*. Odessa, FL: Psychological Assessment Resources.

Elliot, A. J. (2006). The hierarchical model of approach-avoidance motivation. *Motivation and Emotion, 30*, 111–116. doi:10.1007/s11031-006-9028-7.

Elliot, A. J., & Covington, M. V. (2001). Approach and avoidance motivation. *Educational Psychology Review, 13*, 73–92. doi:10.1023/A:1009057102306.

Elliot, A. J., & Trash, T. M. (2002). Approach-avoidance motivation in personality: Approach and avoidance, temperaments and goals. *Journal of Personality and Social Psychology, 82*, 804–818. doi:10.1037//0022-3514.82.5.804.

Franken, I. H. A. (2002). Behavioral approach system (BAS) sensitivity predicts alcohol craving. *Personality and Individual Differences, 32*, 349–355. doi:10.1016/S0191-8869(01)00030-7.

Franken, I. H. A., Muris, P., & Georgieva, I. (2006). Gray's model of personality and addiction. *Addictive Behaviors, 31*, 399–403. doi:10.1016/j.addbeh.2005.05.022.

Fruyt, F., van de Wiele, L., & van Heeringen, C. (2000). Cloninger's psychobiological model of temperament and character and the five factor model of personality. *Personality and Individual Differences, 29*, 441–452. doi:10.1016/S0191-8869(99)00204-4.

Gomez, R., Cooper, A., & Gomez, A. (2000). Susceptibility to positive and negative mood states: Test of Eysenck's, Gray's, and Newman's theories. *Personality and Individual Differences, 29*, 351–365. doi:10.1016/S0191-8869(99)00198-1.

Graham, C. A., Sanders, S. A., & Milhausen, R. R. (2006). The Sexual Excitation and Sexual Inhibition Inventory for Women: Psychometric properties. *Archives of Sexual Behavior, 35*, 397–410. doi:10.1007/s10508-006-9041-7.

Gray, J. A. (1970). The psychophysiological basis of introversion-extraversion. *Behavioral Research and Therapy, 8*, 249–266.

Gray, J. A. (1982). *The neurophysiology of anxiety: An enquiry into the functions of the septo-hippocampal system*. Oxford: Oxford University Press.

Hirschfeld, M. (1921/2012). *Sexualpathologie: Ein Lehrbuch für Ärzte und Studierende. Band 1* [Sexual pathology. A textbook for physicians and students]. Bonn: Marcus & Weber.

Impett, E. A., Peplau, L. A., & Gable, S. (2005). Approach and avoidance sexual motives: Implications for personal and interpersonal well-being. *Personal Relationships, 12*, 465–482. doi:10.1111/j.1475-6811.2005.00126.x.

Janssen, E. (2011). Sexual arousal in men: A review and conceptual analysis. *Hormones and Behavior, 59*, 708–716. doi:10.1016/j.yhbeh.2011.03.004.

Janssen, E., & Bancroft, J. (1996, June). *Dual control of sexual response: The relevance of central inhibition.* Paper presented at the meeting of the International Academy of Sex Research, Rotterdam, The Netherlands.

Janssen, E., & Bancroft, J. (2007). The dual-control model: The role of sexual inhibition and excitation in sexual arousal and behavior. In E. Janssen (Ed.), *The psychophysiology of sex* (pp. 197–222). Bloomington: Indiana University Press.

Janssen, E., Goodrich, D., Petrocelli, J. V., & Bancroft, J. (2009). Psychophysiological response patterns and risky sexual behavior in heterosexual and homosexual men. *Archives of Sexual Behavior, 38*, 538–550. doi:10.1007/s10508-008-9432-z.

Janssen, E., Vorst, H., Finn, P., & Bancroft, J. (2002a). The Sexual Inhibition (SIS) and Sexual Excitation (SES) Scales: I. Measuring sexual inhibition and excitation proneness in men. *Journal of Sex Research, 39*, 114–126. doi:10.1080/00224490209552130.

Janssen, E., Vorst, H., Finn, P., & Bancroft, J. (2002b). The Sexual Inhibition (SIS) and Sexual Excitation (SES) Scales: II. Predicting psychophysiological response patterns. *Journal of Sex Research, 39*, 127–132. doi:10.1080/00224490209552131.

Kafka, M. P. (1994). Paraphilia-related disorders—Common, neglected, misunderstood. *Harvard Reviews in Psychiatry, 2*, 39–40. doi:10.3109/10673229409017112.

Kafka, M. P. (1997). Hypersexual desire in males: An operational definition and clinical implications for males with paraphilias and paraphilia-related disorders. *Archives of Sexual Behavior, 26*, 505–526. doi:10.1023/A:1024507922470.

Kafka, M. P. (2000). The paraphilia-related disorders: Nonparaphilic hypersexuality and sexual compulsivity/addiction. In S. R. Leiblum & R. C. Rosen (Eds.), *Principles and practice of sex therapy* (pp. 471–503). New York: Guilford.

Kafka, M. P. (2010). Hypersexual disorder: A proposed diagnosis for DSM-V. *Archives of Sexual Behavior, 39*, 377–400. doi:10.1007/s10508-009-9574-7.

Kafka, M. P., & Hennen, J. (1999). The paraphilia-related disorders: An empirical investigation of nonparaphilic hypersexuality disorders in outpatient males. *Journal of Sex and Marital Therapy, 25*, 305–319. doi:10.1080/00926239908404008.

Kalichman, S. C., & Rompa, D. (1995). Sexual sensation seeking and compulsivity scales: Reliability, validity, and predicting HIV risk behavior. *Journal of Personality Assessment, 76*, 379–395. doi:10.1207/s15327752jpa6503_16.

Kaplan, M. S., & Krueger, R. B. (2010). Diagnosis, assessment, and treatment of hypersexuality. *Journal of Sex Research, 47*, 181–198. doi:10.1080/00224491003592863.

Kingston, D. A., & Firestone, P. (2008). Problematic hypersexuality: A review of conceptualization and diagnosis. *Sexual Addiction & Compulsivity, 15*, 284–310. doi:10.1080/10720160802289249.

Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male*. Philadelphia: Saunders.

Klein, V., Rettenberger, M., Boom, K.-D., & Briken, P. (2013a). Eine Validierungsstudie der deutschen Version des Hypersexual Behavior Inventory (HBI) [A validation study of the German version of the Hypersexual Behavior Inventory (HBI)]. *Psychotherapie, Psychosomatik, Medizinische Psychologie, 64*, 136–140. doi:10.1055/s-0033-1357133.

Klein, V., Rettenberger, M., & Briken, P. (2014). Self-reported indicators of hypersexuality and its correlates in a female online sample. *Journal of Sexual Medicine*, *11*, 1974–1981. doi:10.1111/jsm.12602.

Klein, V., Rettenberger, M., Turner, D., & Briken, P. (2013b). HBI—Hypersexual Behavior Inventory. In B. Strauß, E. Brähler, & D. Richter (Eds.), *Sexualwissenschaftliche Testverfahren* [Sexological Questionnaires] (pp. 107–112). Göttingen: Hogrefe.

Lang, F. R., Lüdtke, O., & Asendorpf, J. B. (2001). Testgüte und psychometrische Äquivalenz der deutschen Version des Big Five Inventory (BFI) bei jungen, mittelalten und alten Erwachsenen. [Validity and psychometric equivalence of the German version of the Big Five Inventory in young, middle-aged and old adults]. *Diagnostica, 47*, 111–121. doi:10.1026//0012-1924.47.3.111.

Långström, N., & Hanson, R. K. (2006). High rates of sexual behavior in the general population: Correlates and predictors. *Archives of Sexual Behavior, 35*, 37–52. doi:10.1007/s10508-006-8993-y.

Larsen, R. J., & Augustine, A. A. (2008). Basic personality dispositions related to approach and avoidance: Extraversion/neuroticism, BAS/BIS, and positive/negative affectivity. In A. J. Elliot (Ed.), *Handbook of approach and avoidance motivation* (pp. 151–164). New York: Taylor & Francis.

Larsen, R. J., & Ketelaar, T. (1991). Personality and susceptibility to positive and negative emotional states. *Journal of Personality and Social Psychology, 61*, 132–140. doi:10.1037/0022-3514.61.1.132.

Laumann, E. O., Gagnon, J. H., Michael, R. T., & Michaels, S. (1994). *The social organization of sexuality: Sexual practices in the United States*. Chicago: University of Chicago Press.

Levine, S. B. (2010). What is sexual addiction? *Journal of Sex and Marital Therapy, 36*, 261–275. doi:10.1080/00926231003719681.

Marshall, L. E., & Briken, P. (2010). Assessment, diagnosis, and management of hypersexual disorders. *Current Opinion in Psychiatry, 23*, 570–573. doi:10.1097/YCO.0b013e32833d15d1.

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*, 81–90. doi:10.1037/0022-3514.52.1.81.

Milhausen, R. R., Graham, C. A., Sanders, S. A., Yarber, W. L., & Maitland, S. D. (2008). Validation of the Sexual Excitation/Sexual Inhibition Inventory for Women and Men (SESII-W/M). *Archives of Sexual Behavior, 39*, 1091–1104. doi:10.1007/s10508-009-9554-y.

Muise, A., Milhausen, R. R., Cole, S. L., & Graham, C. (2013). Sexual compulsivity in heterosexual married adults: The role of sexual excitation and sexual inhibition in individuals not considered "high-risk". *Sexual Addiction & Compulsivity, 20*, 192–209. doi:10.1080/10720162.2013.786661.

Nguyen, H. V., Koo, K. H., Davis, K. C., Otto, J. M., Hendershot, C. S., Schacht, R. L., … Norris, J. (2012). Risky sex: Interactions among ethnicity, sexual sensation seeking, sexual inhibition, and sexual excitation. *Archives of Sexual Behavior, 41*, 1231–1239. doi:10.1007/s10508-012-9904-z.

Pardo, Y., Aguilar, R., Molinuevo, B., & Torrubia, R. (2007). Alcohol use as a behavioural sign of disinhibition: Evidence from J. A. Gray's model of personality. *Addictive Behaviors, 32*, 2398–2403. doi:10.1016/j.addbeh.2007.02.010.

Park, S. M., Park, Y. A., Lee, H. W., Jung, H. Y., Lee, J.-Y., & Choi, J.-S. (2013). The effects of behavioral inhibition/approach system as predictors of Internet addiction in adolescents. *Personality and Individual Differences, 54*, 7–11. doi:10.1016/j.paid.2012.07.033.

Pinto, J., Carvalho, J., & Nobre, P. J. (2013). The relationship between the FFM personality traits, state psychopathology, and sexual compulsivity in a sample of male college students. *Journal of Sexual Medicine, 10*, 1773–1782. doi:10.1111/jsm.12185.

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*, 203–212. doi:10.1016/j.jrp.2006.02.001.

Reid, R. C., Carpenter, B. N., Hook, J. N., Garos, S., Manning, J. C., Gilliland, R., et al. (2012). Report of findings in a DSM-5 field trial for hypersexual disorder. *Journal of Sexual Medicine, 9*, 2868–2877. doi:10.1111/j.1743-6109.2012.02936.x.

Reid, R. C., Carpenter, B. N., & Lloyd, T. (2009a). Assessing psychological symptom patterns of patients seeking help for hypersexual behavior. *Sexual and Relationship Therapy, 24*, 47–63. doi:10.1080/14681990802702141.

Reid, R. C., Garos, S., & Carpenter, B. N. (2011a). Reliability, validity, and psychometric development of the Hypersexual Behavior Inventory in an outpatient sample of men. *Sexual Addiction & Compulsivity*, *18*, 30–51. doi:10.1080/10720162.2011.555709.

Reid, R. C., Garos, S., Carpenter, B. N., & Coleman, E. (2011b). A surprising finding related to executive control in a patient sample of hypersexual men. *Journal of Sexual Medicine, 8*, 2227–2236. doi:10.1111/j.1743-6109.2011.02314.x.

Reid, R. C., Harper, J. M., & Anderson, E. H. (2009b). Coping strategies used by hypersexual patients to defend against the painful effects of shame. *Clinical Psychology and Psychotherapy, 16*, 125–138. doi:10.1002/cpp.609.

Reid, R. C., Karim, R., McCrory, E., & Carpenter, B. N. (2010). Self-reported differences on measures of executive function and hypersexual behavior in a patient and community sample of men. *International Journal of Neuroscience, 120*, 120–127. doi:10.3109/00207450903165577.

Rettenberger, M., & Briken, P. (2013). Das Duale Kontrollmodell von John Bancroft und Erick Janssen: Eine Theorie sexuellen Erlebens und Verhaltens [The dual control model by John Bancroft and Erick Janssen: A theory about sexual experience and behavior]. *Zeitschrift für Sexualforschung, 26*, 211–231. doi:10.1055/s-0033-1350477.

Rettenberger, M., Dekker, A., Klein, V., & Briken, P. (2013). Klinische und forensische Aspekte hypersexuellen Verhaltens [Clinical and forensic aspects of hypersexual behavior]. *Forensische Psychiatrie, Psychologie, Kriminologie, 7*, 3–11. doi:10.1007/s11757-012-0194-z.

Schmitt, D. P. (2004). The Big Five related to risky sexual behaviour across 10 world regions: Differential personality associations of sexual promiscuity and relationship infidelity. *European Journal of Personality, 18*, 301–319. doi:10.1002/per.520.

Schultz, K., Hook, J. N., Davis, D. E., Penberthy, J. K., & Reid, R. C. (2014). Non-paraphilic hypersexual behavior and depressive symptoms: A meta-analytic review of the literature. *Journal of Sex & Marital Therapy*, *40*, 477–487. doi:10.1080/0092623X.2013.772551.

Smillie, L. D. (2008). What is reinforcement sensitivity? Neuroscience paradigms for approach-avoidance process theories of personality. *European Journal of Personality, 22*, 359–384. doi:10.1002/per.674.

Spector, I. P., Carey, M. P., & Steinberg, L. (1996). The Sexual Desire Inventory: Development, factor structure, and evidence of reliability. *Journal of Sex and Marital Therapy, 22*, 175–190. doi:10.1080/00926239608414655.

Steele, V. R., Staley, C., Fong, T., & Prause, N. (2013). Sexual desire, not hypersexuality, is related to neurophysiological responses elicited by sexual images. *Socioaffective Neuroscience & Psychology, 3*, 20770. doi:10.3402/snp.v3i0.20770.

Strobel, A., Beauducel, A., Debener, S., & Brocke, B. (2001). Eine deutschsprachige Version des BIS/BAS-Fragebogens von Carver und White [A German Version of Carver and White's BIS/BAS Scales]. *Zeitschrift für Differentielle und Diagnostische Psychologie, 22*, 216–227. doi:10.1024//0170-1789.22.3.216.

Terracciano, A., & Costa, P. T. (2004). Smoking and the five-factor model of personality. *Addiction, 99*, 472–481. doi:10.1111/j.1360-0443.2004.00687.x.

Turner, D., Briken, P., Klein, V., & Rettenberger, M. (2013). SIS/SES-SF—Sexual Inhibition/Sexual Excitation Scales-Short Form. In B. Strauß, E. Brähler, & D. Richter (Eds.), *Sexualwissenschaftliche Testverfahren* [Sexological Questionnaires] (pp. 168–172). Göttingen: Hogrefe.

von Krafft-Ebing, R. (1893/2005). *Psychopathia sexualis*. Stuttgart: Enke.

Walters, G. D., Knight, R. A., & Långström, N. (2011). Is hypersexuality dimensional? Evidence for the DSM-5 from general population and clinical samples. *Archives of Sexual Behavior, 40*, 1309–1321. doi:10.1007/s10508-010-9719-8.

Weis, D. L. (1998). The use of theory in sexuality research. *Journal of Sex Research, 35*, 1–9. doi:10.1080/00224499809551912.

Winters, J., Christoff, K., & Gorzalka, B. B. (2009). Conscious regulation of sexual arousal in men. *Journal of Sex Research, 46*, 330–343. doi:10.1080/00224490902754103.

Winters, J., Christoff, K., & Gorzalka, B. B. (2010). Dysregulated sexuality and high sexual desire: Distinct constructs? *Archives of Sexual Behavior, 39*, 1029–1043. doi:10.1007/s10508-009-9591-6.

Zargar, Y., & Ghaffari, M. (2009). Simple and multiple relationships between Big-Five personality dimensions and addiction in university students. *Iranian Journal of Public Health, 38*, 113–117.

Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensation seeking*. New York: Cambridge University Press.

Zuckerman, M. (2007). *Sensation seeking and risky behavior*. Washington, DC: American Psychological Association.