12

A Meeting of Minds: Can Cognitive Psychology Meet the Demands of Queer Theory?

Sapphira R. Thorne and Peter Hegarty

Introduction

For over fifty years, cognitive psychologists have grappled with how best to understand how people conceptualize. Since the cognitive revolution, concepts have been defined in diverse ways that tend to assume that they form the 'building blocks' of abstract rational thought (Solomon, Medin, & Lynch, 1999). Theories of categorization are diverse and have been narrated as successive waves of categorization research from *classical* (categories with discrete boundaries) to *probabilistic* (categories formed by prototypes and exemplars) to *explanation-based* (categories based on explanations), with each wave demonstrating how the former

S. R. Thorne (✉)
School of Psychology, Cardiff University, Cardiff, UK
e-mail: ThorneS5@cardiff.ac.uk

P. Hegarty
School of Psychology, University of Surrey, Guildford, UK
e-mail: p.hegarty@surrey.ac.uk

K. C. O'Doherty et al. (eds.), *Psychological Studies of Science and Technology*, Palgrave Studies in the Theory and History of Psychology,
https://doi.org/10.1007/978-3-030-25308-0_12

wave failed to account for the complexity and flexibility of how humans reason with categories (Hampton, 2010; Komatsu, 1992; Margolis, 1994; Medin, 1989). In this chapter, we take a different stance to the study of categorization and make an argument about the affordances of cognitive theories of categorization for queer approaches to science and technology.

From the vantage point of critical psychology, this project may seem strange. A traditional view in social cognition is that people categorize others by race, gender, and other matters automatically and uncontrollably, and that these categories allow people to operate as 'cognitive misers' spending little resources making sense of others (e.g., Taylor, Fiske, Etcoff, & Ruderman, 1978). From this perspective, queering psychology seems like an impossible task that asks people to do something very unnatural. In this chapter we argue that thinking queerly might be much easier than the 'cognitive miser' view allows, and we use the categorization systems developed by cognitive psychologists in order to make our argument.

We mean this essay to do something akin to Barad's notion of *diffractive reading*; 'a transdisciplinary reading approach that remains rigorously attentive to important details of specialized arguments within a given field, in an effort to foster constructive engagements across (and a reworking of) disciplinary boundaries' (p. 25). As such, we first examine what is at stake in queering psychology, next review the history of cognitive psychological studies of concepts, and lastly draw both together to discuss contemporary critical psychological work in intersex.

Queer Theory and Psychology

Queer theory emerged in the late 1980s and early 1990s as a refusal to conceptualize lesbian, gay and queer experiences primarily in terms of their difference from heterosexuality, but instead to make sense of them as cultures in their own right (Jagose, 1996; Turner, 2000). Strongly influenced by the dark visions of psychology, psychiatry, and sexology in the work of Michel Foucault (1976/1998) queer theorists tended

to assume that psychology was a means for the exercise of disciplinary power, which worked not so much by rendering people invisible, but by creating documentation about them (Foucault, 1975). Foucault urged distrust of appeals to 'natural' sexuality, insisting that all ideas of the 'natural' were grounded in conceptual frameworks produced first-and-foremost to legitimate the exercise of power (Foucault, 1976/1998). Queer theorists refused to posit what queer theory was for, preferring instead to describe what is negated:

> Queer is by definition whatever is at odds with the normal, the legitimate, the dominant. There is nothing in particular to which it necessarily refers. It is an identity without an essence… a positionality that is not restricted to lesbians and gay men but is in fact available to anyone who is or who feels marginalised because of her or his sexual practices. (Halperin, 1995, p. 62)

Queer theory was, as such, more explicit about negation than affirmation.

For this reason, queer theory seemed at odds with psychology's liberal narrative of 'affirmation' of lesbian and gay identities, and later of bisexual and transgender identities (Clark, Ellis, Peel, & Riggs, 2010; Downing & Gillett, 2011; Johnson, 2015; see Hegarty, 2017 for a history). One response to the representational limitations of affirmative particular social groups is to understand queer not as one-more identity, but as shifting the structure of the category to that of an umbrella term. It is not precisely clear what such an umbrella term covers, but it is oriented toward sheltering diverse people whose primary shared attribute may be their vulnerability to heteronormativity and related forms of epistemological violence (Teo, 2010).

There may be more freedom in a category so defined, than in one defined in terms of the possession of fixed social identities. Social categories do more than identify. They can also create strict boundaries, such as those that demarcate female and male, straight and gay, etc. This very ambiguity of queer—as both a named space under the umbrella and a comment on the umbrella's structure—suggests the ordinariness with which people make generous sense of the world in non-miserly ways.

Several mainstream developments in LGBT psychology in the early 2000s, such as research on sexual fluidity (Diamond, 2003, 2004), the political meanings of essentialist beliefs (Hegarty, 2002), and historically situated life narratives of lesbians, gay men and bisexuals (Hammack & Cohler, 2009), were influenced by queer theory. Critical psychology and lesbian and gay affirmative psychology presented dilemmas for each other about engaging mainstream psychology's liberal vision of advancing equal rights and engaging in psychology's positivist-empiricist epistemologies (see Kitzinger, 1997 for an early discussion). Social constructionism explicitly opposed positivist-empiricist assumptions that something is either A or B, and that empirical research should determine which of those two things it is (e.g., Brown, 1989; DeLamater & Hyde, 1998). If psychology is to be queer, then it must be qualitative in the minds of some (Warner, 2004). For others, the only obvious reason to engage in quantitative psychology was to establish matters of fact, to achieve some kind of political end (e.g., Kitzinger & Coyle, 2000; Rivers, 2000). However, so doing, overlooks the politics of fact-making practices and particularly the fact that human research subjects routinely do things agentially that surprise and confound researchers, some of which are captured as 'data' and some of which elude such categorization (Hegarty, 2001, 2007). As approaches such as agential realism make clear, it is possible to engage in forms of experimentation that are directly tied to philosophical and political questions, and which presume that phenomena A and B do not preexist experimental observation, but become stable, replicable consequences of observation in interaction with experimenters' and their tools.

Concepts and Categories: A Short Review

Cognitive psychology was strongly influenced by cybernetics and Gestalt theories which emphasized the active constructive properties of minds in formulating hypotheses (Tolman, 1948; Wason, 1960). The positivism critiqued by social constructionists has roots in a 'classical' view of categorization, a view that assumes that categories have discrete boundaries defined by their necessary and sufficient properties which

scientific observation can discern (Popper, 1959/2002). Cognitive psychology's epistemology is informed by Popperian norms for scientific logic. By this we mean that cognitive psychologists conduct experiments that subject existing theories of categorization to tests of falsification; theories that survive tests of falsification are accepted while those that are falsified by evidence are rejected. This epistemology presumes that things exist or not prior to their becoming objects of study, putting cognitive psychology at odds with some versions of social constructionism that emerged in sexuality research (DeLamater & Hyde, 1998). We will return to the question of what cognitive psychologists can be described as having done, in relation to these logical Popperian norms, in the conclusion. In the interim, our reading of its history aims to diffract cognitive psychology's findings and its logical commitments.

Research conducted prior to the 1970s endorsed the *classical* theory that people represent concepts with necessary features, possessed by every member, and sufficient features, possessed only by category members, which jointly render categories quite clear-cut and discrete (Machery, 2009; Medin, 1989). The social category bachelor was often used to exemplify the classical theory, on the ground a bachelor possesses the necessary, and binary, features of being unmarried and a man. While Popperian logic requires drawing out such classical implications of theories and testing them, reasoning as if categories were classical creates the conditions for the mis-recognition of people who have a mix of necessary and sufficient features (Dunham & Olson, 2016), as appears to be the case commonly with gender (Hyde, Bigler, Joel, Tate, & van Anders, 2018). The example of bachelor also shows the limits of the classical theory, as both gender and marital status are normative concepts with additional teleological meanings, that are historically specific. These meanings are evident in widespread social anxieties that bachelors might not end up married which characterized the nineteenth century moment when the word became widespread (Bertolini, 1996). The movement toward an increased recognition of diversity in terms of gender (e.g., intersex) and marital status (e.g., civil partnership) in the twenty-first century renders this example problematic.

In recognition of some of the shortcomings of classical theory, Eleanor Rosch's *prototype theory* allowed concepts to be represented

by attributes that share a *family resemblance* (Rosch, 1975; Rosch & Mervis, 1975; see Mervis & Rosch, 1981). The metaphor of family resemblance—drawn from Wittgenstein (1953)—moved cognitive psychologists to imagine that the possession of similar naturally occurring attributes explained category membership. Rosch's prototype view presented category membership as continuous based on the possession of central and peripheral features that were present in a category *prototype*, which represented a category's most typical member. Thus a robin was more central to the category bird than an ostrich, as it possesses more similar features to the prototype, and often-replicated experiments showed that category centrality eases processing, learning, and retrieval (Rosch, 1973, 1975; Rosch, Simpson, & Miller, 1976). Rosch's work pertained to object categories, such as furniture, animal categories, such as birds, and was captured by debates about the naturalness of color categories, whose labels vary considerably between human languages (Berlin & Kay, 1969). We emphasize three critical directions of categorization research that followed from Rosch's work next.

First, consider how critical scholars in science and technology studies know that humans usually categorize for some kind of social purpose, and that they often reason with classical and prototype representations of categories at once (Bowker & Starr, 1999). Goal-directed categories such as 'foods to eat on a diet' rarely have a 'family resemblance' and their best examples are *ideal* types rather than averages (Barsalou, 1982, 1983). This point seems to echo Butler's (1990) theory of gender, among others, as a system that is put in place to achieve certain ends, and which creates the sense not of what genders are, but what they *might* or *should be.* The goals that people have for creating their categorizations vary between individuals, between cultures, and by expertise (see Medin et al., 2006). Moreover, Barsalou's (1982) example of 'foods to eat on a diet' touches particularly on the normalization of gender. Dieting and body image are areas where the experience of reality and ideals differ (Fallon & Rozin, 1985), and the line between caring for oneself and subjecting oneself to normalization requires Foucaultian insights to discern (Heyes, 2006).

Second, to the extent that prototype theory assumes relatively stable graded structure it struggles to explain contextual variability in meaning

(Roth & Schoben, 1983). People routinely turn the volume up or down on particular social category memberships in ordinary social situations all the time (Tajfel & Turner, 1986). For example, in some situations our behavior is interpreted by ourselves and our interaction partners as an expression of gender and in other situations it is not (Deaux & Major, 1987). Failing to consider the ordinariness with which people change categories to fit social contexts can not only underestimate, but curtail the agency that people need to exercise in ordinary life.

Third, the meaning of categories changes when such categories are combined (e.g., Hampton, 1987; Hastie, Schroeder, & Weber, 1990; Murphy, 1988; Smith & Osherson, 1984; Smith, Osherson, Rips, & Keane, 1988). In the 1990s, researchers started to consider how social categories may be combined to produce new categories (e.g., see Hastie et al., 1990; Kunda, Miller, & Claire, 1990; Kunda & Oleson, 1995; Storms, De Boeck, Van Mechelen, & Tuts, 1996). Categories of people under the queer umbrella often emerged as good examples of category combination effects. For example, stereotypes of a 'gay construction worker' that come to mind might not have the prototypical features of either a gay man or a construction worker as prototype theories would presume. Rather, novel meanings emerge from constructing a narrative in response to that surprising conjunction, such as one participant in Kunda et al. (1990, p. 556) who constructed the narrative that 'This person is most likely sublimating.' This facility for narration of category combinations was also demonstrated some years earlier by Kessler and McKenna (1978). They delivered a series of preprepared random yes/no answers to questions that might allow participants to discern the gender of a person that the experimenter held in mind. Participants were quick and successful in resolving the discrepancies they produced (reasoning that a person with a beard in a skirt might be a Hawaiian or Scottish man, for example), but always by reiterating the logic of the two-gender system in making sense of such cases. These experiments should be read in light of Jerome Bruner's (1990) arguments at this time that the basic unit of sense-making was not information but narrative.

Inflexibility in the prototype view prompted a number of 'exemplar' theories of categorization. Exemplar theory was developed as an umbrella term to refer to theories which assumed that conceptual

structure was defined by multiple exemplars rather than a single prototype (e.g., Medin & Schaffer, 1978; Smith & Medin, 1981). Prototypes may describe the conceptual structure of novices, while exemplars describe the conceptualizations that experts use in a domain (e.g., Genero & Cantor, 1987).

One theory of category activation relied on both prototype and exemplar representation to approach a question that is central to queer inquiry; how do people think in ways that assume that some events or people are the taken-for-granted norm? Kahneman and Miller's (1986) norm theory assumes that the categories used to think with have a prototype structure, but also that different exemplars of the same category can be activated to form a working representation or norm that supports abstract thought about a category or event. Consider for example the account of norms offered by Lorde (1984, p. 116):

> Somewhere on the edge of consciousness there is what I call a mythical norm, which each one of us within our hearts knows "that is not me." In America, this norm is usually defined as white, thin, male, young, heterosexual, Christian, and financially secure. It is with this mythical norm that the trappings of power reside within this society. Those of us who stand outside that power often identify one way in which we are different, and we assume that to be the primary cause of all oppression, forgetting other distortions around difference, some of which we ourselves may be practicing.

Kahneman and Miller's (1986) theory addresses such normativity by arguing that category norm representations in working memory render the most common features of exemplars implicit. Their theory inspired studies examining how people spontaneously construct explanations for empirical group differences by taking higher status groups (such as men, heterosexuals, or White people) as the background norm for comparison and lower status groups (such as women, lesbians/gay men, and Black people) as the 'effect to be explained.' Later experimental research further demonstrated that such asymmetric explanations communicate the relative agency, power, status, and self-worth of those groups (Hegarty & Bruckmüller, 2013). Recently, Thorne (2018) examined the

conceptualization of love between couples that vary by their partners' genders. Heterosexual participants' concepts of heterosexual love were closer to their default concept of love than was their concept of love between two women or two men. Sexual minority participants considered love between men but not love between women closer to their default, demonstrating a *homonormative* pattern, suggesting that their concepts of love had become more inclusive along lines of sexuality, but remained practically exclusive along lines of gender (see also Hegarty, Sczerba, & Skelton, 2019).

In the mid-1980s, it also started to become clear that similarity, could not explain why some things seemed to belong to the same category. Rather theories—networks of causal and explanatory links—act as the conceptual 'glue' to hold conceptual structures together (Murphy & Medin, 1985), and central features of a category are held together through conceptual theories combining context, function, and prior knowledge (e.g., Kempton, 1981; Medin, Lynch, Coley, & Atran, 1997; Medin & Ortony, 1989; Murphy & Wright, 1984). In the 1990s, theorists grew more interested in one explanation-based form of theory; *essentialism*—the assumption that categories have an underlying essence that causes and explains their diverse observable features (Medin & Ortony, 1989). Around this same time attempts were increasingly made to isolate and contain a theory of concepts that does not draw upon broader cultural knowledge reached its limit, and several researchers started to evaluate theories of concepts more extensively in terms of how these theories may make sense to ordinary people (e.g., Kelley, 1992; Komatsu, 1992; MacLaury, 1991). MacLaury (1991) argued that people may use more than one cognitive system to represent the same category. For example, the oddness and evenness of numbers can be categorized both classically (i.e., as categories with necessary and sufficient features) and as a category with graded structure (i.e., as a category with central and peripheral features) (Armstrong, Gleitman, & Gleitman, 1983), and the concept of 'doctor' can have both strict rules for category membership and be structured around a prototype (Dahlgren, 1985). This argument is post-positivist, diffractive and queer. It allows for the possibility of meaningful experimental phenomena, but does so by assuming not a static notion of categories, but

one where categorization occurs in replicable interactions with scientific observers. As such people can show an *illusion of explanatory depth*; they think they understand the logical structure of their category structure more than they actually do (Hampton, 2010). Experimental research on category norms and explanations show that this illusion is highly asymmetric. As a result, such experimental research justifies the claims of critical psychologists that it is heterosexist to explain differences by focusing on attributes of nonheterosexual individuals and couples while conflating actual heterosexual individuals or couples with the default, ideal or norm (Herek, Kimmel, Amaro, & Melton, 1991), just as it is androcentric to reason about gender asymmetrically (Bailey, La France, & Dovidio, 2018) or a cultural misattribution bias (Causadias, Vitriol, & Atkin, 2018) to do so about race, ethnicity or culture.

Around the same time, queer theory started to emerge, in part from the ruins of a debate in lesbian and gay studies about whether it was more strategic to posit a discrete and immutable homosexual identity to account for very widespread historical and cultural evidence of homosexual acts, or if it were better to understand homosexuality as something 'socially constructed' by historical and cultural contexts (Stein, 1992). These conversations were sometimes described as essentialist-constructivist debates. Consistent with MacLaury's (1991) view, early queer theory texts argued that the essentialist-constructivist debates were irresolvable in absolute political or ethical terms; queer scholarship opposed an internally contradictory ideology that would construct new logical grounds to justify itself if it were threatened (Sedgwick, 1990). Queer theorists and cognitive psychologists independently came to the same conclusion, that human categorization is grounded in larger theories, and is not simply a reflection of stable or classical essences. Dominant cognitive miser theories in social cognition did not do justice to either development, and criticisms of social cognition as a cognitive miser theory may have missed what was most interesting and queer in the cognitive literature at this point in time.

Before moving to argue for the relevance of this intellectual history for contemporary intersex studies, we should note that cognitive psychologists often continued to exemplify their ideas in ways that naturalized essentialist understandings of sexuality and gender rather than

took then as ideal objects of empirical inquiry. In an insightful synthesis of categorization research, Medin (1989, pp. 1476–1477) used gender attribution to exemplify psychological essentialism as follows.

> People in our culture believe that the categories male and female are genetically determined, but to pick someone out as male or female we rely on characteristics such as hair length, height, facial hair and clothing that represent a mix of secondary sexual characteristics and cultural conventions. Although these characteristics are more unreliable than genetic evidence, they are far from arbitrary. Not only do they have some validity in the statistical sense, but they are tied to our biological and cultural conceptions of male and female.

This quote closes our argument to diffract the findings from the ontology in cognitive psychology. Medin (1989) did not cite Kessler and McKenna (1978), but recognizes that we often categorize others on the basis of their inferred unobserved physical attributes, which are given a projected 'essential' explanatory status. Yet, Medin's quote enacts a dubious genetic essentialism of its own, constructing genes as the most reliable and statistically valid indicator of gender category membership, and tying them to a consensually shared biological and cultural two-gender system. As we show next, agency in intersex studies can be enabled by the ways in which categorization research psychologizes the very ordinariness of thinking queerly, but also be drawing on the insights of Kessler and McKenna (1978) which the best cognitive research on this topic—here and elsewhere—visibly misses.

Implications for a Critical Psychology of Science and Technology

So far in this chapter, we have made the argument that people categorize the world in several different ways; this is evident in the cognitive psychology literature. More critically, people may use these different categorization systems flexibly depending on the context. How does this matter to the reach of a critical psychology of science and technology

which this edited volume aims to extend? To address this question and to exemplify how categorizing queerly can be very ordinary, we turn our attention to the study of intersex.

The history of psychologists' affirmative engagements with intersex has, at this point in time, yet to be written (but see Hegarty, 2017, pp. 96–99). Psychology's problematic investment in intersex became more profound with the decades-long unprincipled practice initiated by psychologist John Money. Money developed his gender theory as the cognitive revolution was taking shape, and he took the children's natural cognitive capacity to learn any language as an analogy to undergird his claim that a child could learn any gender within a critical period (Morland, 2015). These assumptions undergirded recommendations for early 'corrective' surgeries on infants which are now a matter of global human rights concern, on the grounds that they enact bodily harm and deny rights to self-determination (Carpenter, 2016). Money's misreading of the cybernetic theory of his time and these later abuses are related; Money misunderstood how open the child's emerging gender—like any cybernetic system—could be to feedback and change, obfuscating the harm that is done by surgical interventions that aim to insert the child into the two-gender cultural system (Kessler, 1990; Morland, 2015). In other words, the historical entanglement of people with intersex traits and psychology—and the ethical questions about self-determination in the present—matters to the history of cybernetics, arguments about the uniquely human creativity expressed in language, the capacities of humans to use signify realities in multiple in commensurate systems, and the relationships between experts and laypeople's shared and contested understandings of the terms that are used to understand reality. The politics of neologism continue.

Since 2006, medical consensus has strongly proscribed the use of the term 'disorders of sex development' or DSD. We do not have space here to review the events that lead to this 'Chicago Consensus Statement' (but see Davis, 2015). The argument for DSD reproduced the ideal that good categories were classical, grounded in natural facts—such as genes, while bad categories had pejorative and controversial meanings. As a conceptual and linguistic intervention, DSD has been a practical success but an ontological failure with predictable negative consequences. Within medical

debates, experts disagree as to whether genetic features or genital anatomy constitute the essential features of the DSD category, with competing professional interests on both sides of the debate, and the inclusion or exclusion of common forms of embodiment such as Turner's syndrome and Klinefelter's syndrome hanging in the balance (Griffiths, 2018).

However, recent psychosocial research shows how the invention of DSD recapitulates the errors of assuming categories to be good only if they are classical categories with clearly defined boundaries. Diagnostic categories delivered by clinicians fail to provide the conceptual flexibility demanded by everyday life (Lundberg, Linstrom, Roen, & Hegarty, 2016). In practice many people need to alter the volume on these categories, and to compartmentalize them rather than assume that they are all-defining (Lundberg, Roen, Hirschberg, & Frisen, 2016). For example, young people can also combine the language of 'intersex' and 'DSD' with fluency. As one young person with an intersex variation in Lundberg, Hegarty, and Roen's (2018, p. 167) study put it: 'I think DSD just describes physically how my sex development has been different and Intersex just describes how I feel like my gender identity is maybe not a 100% female.' Young people with intersex traits are variably aware of DSD and intersex as categories that others have used to name their experience. They and their parents, in different contexts, avoid using them, use them to describe traits but not people, use them interchangeably, and adopt them as social identities. Such flexibility is necessary in lifeworlds in which people must orient to managing privacy under the threat of others' fascination, form meaningful identities and relationships, and communicate in medicalized and nonmedical environments about their wishes and needs while keeping options for revision open down the line (Lundberg et al., 2018). The ordinariness of this is paramount to our argument about how natural and ordinary it is for individuals to apply different categorization systems to understand their own social identities—a far cry from the image of the 'cognitive miser.' It would be miserly to insist upon a more rigid, fixed, consistent, or trans-situational approach to making sense of oneself or one's children. It is hard to escape the conclusion that such attempts do indeed re-extend the reach of the scientific and medical authority into the lived realities of such individuals and their families.

It is simple and ordinary for people to switch between categories, and between forms of representing those categories via exemplars, traits, or rules of definition in discourse. Social identity theorists have long explored these questions using both discursive and experimental frameworks of understanding, often in communication with each other. Working in that tradition, Morgenroth and Ryan (2018) have recently argued for a return to Judith Butler's work in social psychology to ground understandings of the flexibility and performativity of gender, as in Deaux and Major's (1987) model of gender stereotyping, for example. Intersex takes us beyond gender to showing the material consequences of thinking about category complexity as ordinary in regard to the impact that variable sex characteristics can make to lives lived in socio-technical societies. As Lundberg et al.'s (2018) work suggests, language terms do not simply signify anatomic features here but *theories* about the ways in which bodies and selves are or are not related. Those theories communicated by language use afford ground for materially different medical decisions with lifelong consequences (e.g., Streuli, Vayena, Cavicchia-Balmer, & Huber, 2013). By critically engaging in post-positivist and queer thinking *about thinking*, critical psychology can engage these dynamics and make difference in science and reality.

Conclusion

In conclusion, we argued here for a diffractive reading of categorization research. To be sure, the logic of cognitive psychology itself needs to be read critically, as our focus on the validity of the genetic basis of gender was meant to exemplify above. However, ours is not an idealist argument against fuzzy meaning per se; quite the opposite. Nothing as abstract as categorization—or sexuality, or desire or identification—can be communicated, or become a basis for socially shared understanding without structuring metaphors and exemplars, and we consider communication that aims at such shared understandings about these features of human experience to be a worthy and worthwhile thing for psychologists concerned with sense-making to do. As such we read cognitive research diffractively (Barad, 2007), for its replicable

demonstrations of queer thinking that emerge in the research interactions we call experiments (see also Scholz, 2013, for an application of Barad's thought to experimental psychology), and for the ways that its discourse has guided understanding of what minds might be.

Engagement with psychology's mainstream in lesbian and gay affirmative psychology has often been called a form of 'strategic essentialism' (e.g., Kitzinger & Coyle, 2000). We hope that this diffractive reading offers critical psychologies of science and technology a supplementary exemplar of *strategic anti-essentialist* reading. Over the long run since the early cognitive revolution, the Popperian logic of cognitive psychology—which values falsifying preexisting theories with experimental findings—has created an opportunity structure for experiments that attempt to falsify prior theories for their simplifications now for several decades. The emphasis on falsification over replication has more recently become a matter of considerable debate *within* experimental psychology, making it timely to remember that Popper (1959/2002, p. 37) defined falsification, the criterion for demarcating science from non-science, in explicitly *social* and *conventional* terms. For Popper, the suitability of any criterion of falsifiability was not given by logic or material reality, but might be a matter of debate and discussion that rests on matters other than reason, as Potter (1984) has observed it to be in psychologists' discourses.

In the era of the current replication crisis, reasons to reject experimental psychology's truth claims as erroneously socially constructed have never been more available, nor more obviously embraced. Our reading goes beyond reflection on how all-too human research practices are ironically at odds with the ontologies of mind that they produce, to argue that taking the results of such experiments seriously might be a form of enabling agency. Rather than doubt cognitive psychology we argue for an analytic way through its empirical literature because different readings of cognitive psychology change the interpretation of human action in the world. We made this case by looking at how contemporary linguistic politics in intersex are read with two different theories of the individual subject are held in mind; in which gender and linguistic capacity for flexibility are queer, in the pejorative sense and in the sense that thinking queerly is deemed ordinary by cognitive

accounts of sense-making. We hope to have gone at least half-way in making these seemingly different worlds meet in the middle.

Acknowledgements We would like to thank Jeffrey Yen, Kieran O'Doherty, David Griffiths, and Jacy Young for their readings and comments on our initial draft of this chapter.

References

Armstrong, S. L., Gleitman, L. R., & Gleitman, H. (1983). What some concepts might not be. *Cognition, 13,* 263–308.

Bailey, A. H., LaFrance, M., & Dovidio, J. F. (2018). Is man the measure of all things? A social cognitive account of androcentrism. *Personality and Social Psychology Review.*

Barad, K. (2007). *Meeting the universe half-way: Quantum physics and the entanglement of matter and meaning*. Durham, NC: Duke University Press.

Barsalou, L. W. (1982). Context-independent and context-dependent information in concepts. *Memory & Cognition, 10,* 82–93.

Barsalou, L. W. (1983). Ad hoc categories. *Memory & Cognition, 11,* 211–227.

Berlin, B., & Kay, P. (1969). *Basic color terms: Their universality and evolution*. Berkeley: University of California Press.

Bertolini, V. J. (1996). Fireside chastity: The erotics of sentimental bachelorhood in the 1850s. *American Literature, 68,* 707–737.

Bowker, G. C., & Starr, S. L. (1999). *Sorting things out: Classification and its consequences*. Cambridge: MIT Press.

Brown, L. S. (1989). New voices, new visions: Toward a lesbian/gay paradigm for psychology. *Psychology of Women Quarterly, 13,* 445–458.

Bruner, J. (1990). *Acts of meaning*. Cambridge, MA: Harvard University Press.

Butler, J. (1990). *Gender trouble and the subversion of identity*. New York and London: Routledge.

Carpenter, M. (2016). The human rights of intersex people: Addressing harmful practices and rhetoric of change. *Reproductive Health Matters, 24,* 74–84.

Causadias, J. M., Vitriol, J. A., & Atkin, A. L. (2018). Do we overemphasize the role of culture in the behavior of racial/ethnic minorities? Evidence of a cultural (mis)attribution bias in American psychology. *American Psychologist, 73,* 243–255.

Clarke, V., Ellis, S. J., Peel, E., & Riggs, D. W. (2010). *Lesbian, gay, bisexual, trans and queer psychology: An introduction*. Cambridge: Cambridge University Press.

Dahlgren, K. (1985). The cognitive structure of social categories. *Cognitive Science, 9,* 379–398.

Davis, G. (2015). *Contesting intersex: The dubious diagnosis*. New York: New York University Press.

Deaux, K., & Major, B. (1987). Putting gender into context: An interactive model of gender-related behavior. *Psychological Review, 94,* 369–389.

DeLamater, J. D., & Hyde, J. S. (1998). Essentialism vs. social constructionism in the study of human sexuality. *Journal of Sex Research, 35,* 10–18.

Diamond, L. M. (2003). What does sexual orientation orient? A biobehavioral model distinguishing romantic love and sexual desire. *Psychological Review, 110,* 173–192.

Diamond, L. M. (2004). Emerging perspectives on distinctions between romantic love and sexual desire. *Current Directions in Psychological Science, 13,* 116–119.

Downing, L., & Gillett, R. (2011). Viewing critical psychology through the lens of queer. *Psychology & Sexuality, 2,* 4–15.

Dunham, Y., & Olson, K. R. (2016). Beyond discrete categories: Studying multiracial, intersex, and transgender children will strengthen basic developmental science. *Journal of Cognition and Development, 17,* 642–665.

Fallon, A. E., & Rozin, P. (1985). Sex differences in perceptions of desirable body shape. *Journal of Abnormal Psychology, 94,* 102–105.

Foucault, M. (1975). *Discipline and punish: The birth of the prison*. New York: Random House.

Foucault, M. (1998). *The history of sexuality: 1*. London: Penguin.

Genero, N., & Cantor, N. (1987). Exemplar prototypes and clinical diagnosis: Toward a cognitive economy. *Journal of Social and Clinical Psychology, 5,* 59–78.

Griffiths, D. A. (2018). Diagnosing sex: Intersex surgery and 'sex change' in Britain 1930–1955. *Sexualities, 21,* 476–495.

Halperin, D. M. (1995). *Saint Foucault: Towards a gay hagiography*. New York: Oxford University Press.

Hammack, P. L., & Cohler, B. J. (2009). *The story of sexual identity: Narrative perspectives on the gay and lesbian life course*. New York: Oxford University Press.

Hampton, J. A. (1987). Inheritance of attributes in natural concept conjunctions. *Memory & Cognition, 15,* 55–71.

Hampton, J. A. (2010). Concepts in human adults. In D. Mareschal, P. Quinn, & S. E. G. Lea (Eds.), *The making of human concepts* (pp. 293–311). Oxford: Oxford University Press.

Hastie, R., Schroeder, C., & Weber, R. (1990). Creating complex social conjunction categories from simple categories. *Bulletin of the Psychonomic Society, 28,* 242–247.

Hegarty, P. (2001). "Real science", deception experiments and the gender of my lab coat: Toward a new laboratory manual for lesbian and gay psychology. *Critical Psychology, 1,* 91–108.

Hegarty, P. (2002). 'It's not a choice, it's the way we're built': Symbolic beliefs about sexual orientation in the US and Britain. *Journal of Community & Applied Social Psychology, 12,* 153–166.

Hegarty, P. (2007). From genius inverts to gendered intelligence: Lewis Terman and the power of the norm. *History of Psychology, 10,* 132–155.

Hegarty, P. (2017). *A recent history of lesbian and gay psychology: From homophobia to LGBT*. London: Routledge.

Hegarty, P., & Bruckmüller, S. (2013). Asymmetric explanations of group differences: Experimental evidence of Foucault's disciplinary power. *Social and Personality Psychology Compass, 7,* 176–186.

Hegarty, P., Sczerba, A., & Skelton, R. (2019). How has cultural heterosexism affected thinking about divorce? Asymmetric framing of same-gender and mixed-gender divorces in news media and in minds. *Journal of Homosexuality.*

Herek, G. M., Kimmel, D. C., Amaro, H., & Melton, G. B. (1991). Avoiding heterosexist bias in psychological research. *American Psychologist, 46,* 957–963.

Heyes, C. J. (2006). Foucault goes to weight watchers. *Hypatia, 21,* 126–149.

Hyde, J. S., Bigler, R. S., Joel, D., Tate, C. C., & van Anders, S. M. (2018). The future of sex and gender in psychology: Five challenges to the gender binary. *American Psychologist, 74*, 171–193.

Jagose, A. (1996). *Queer theory: An introduction*. New York: New York University Press.

Johnson, K. (2015). *Sexuality: A psychosocial manifesto*. Cambridge: Polity Press.

Kahneman, D., & Miller, D. T. (1986). Norm theory: Comparing reality to its alternatives. *Psychological Review, 93,* 136–153.

Kelley, H. H. (1992). Common-sense psychology and scientific psychology. *Annual Review of Psychology, 43,* 1–23.

Kempton, W. (1981). *The folk classification of ceramics: A study of cognitive prototypes*. New York: Academic Press.

Kessler, S. J. (1990). The medical construction of gender: Case management of intersexed infants. *Signs: Journal of Women in Culture and Society, 16,* 3–26.

Kessler, S. J., & McKenna, W. (1978). *Gender: An ethnomethodological approach*. New York: Wiley.

Kitzinger, C. (1997). Lesbian and gay psychology: A critical analysis. In D. Fox & I. Prilleltensky (Eds.), *Critical psychology: An introduction* (pp. 202–216). Thousand Oaks: Sage.

Kitzinger, C., & Coyle, A. (2000). Introducing lesbian and gay psychology. In C. Kitzinger & A. Coyle (Eds.), *Lesbian and gay psychology: New perspectives*. Leicester, UK: BPS Blackwell.

Komatsu, L. K. (1992). Recent views of conceptual structure. *Psychological Bulletin, 112,* 500–526.

Kunda, Z., Miller, D. T., & Claire, T. (1990). Combining social concepts: The role of causal reasoning. *Cognitive Science, 14,* 551–577.

Kunda, Z., & Oleson, K. C. (1995). Maintaining stereotypes in the face of disconfirmation: Constructing grounds for subtyping deviants. *Journal of Personality and Social Psychology, 68,* 565–579.

Lorde, A. (1984). *Sister outsider: Essays and speeches*. Berkeley, CA: Crossing Press.

Lundberg, T., Hegarty, P., & Roen, K. (2018). Making sense of 'Intersex' and 'DSD': How laypeople understand and use terminology. *Psychology & Sexuality, 9,* 161–173.

Lundberg, T., Lindström, A., Roen, K., & Hegarty, P. (2016). From knowing nothing to knowing what, how and now: Parents' experiences of caring for their children with congenital adrenal hyperplasia. *Journal of Pediatric Psychology, 42,* 520–529.

Lundberg, T., Roen, K., Hirschberg, A. L., & Frisén, L. (2016). "It's part of me, not all of me": Young women's experiences of receiving a diagnosis related to diverse sex development. *Journal of Pediatric and Adolescent Gynecology, 29,* 338–343.

Machery, E. (2009). *Doing without concepts*. New York: Oxford University Press.

MacLaury, R. E. (1991). Prototypes revisited. *Annual Review of Anthropology, 20,* 55–74.

Margolis, E. (1994). A reassessment of the shift from the classical theory of concepts to prototype theory. *Cognition, 51,* 73–89.

Medin, D. L. (1989). Concepts and conceptual structure. *American Psychologist, 44,* 1469–1481.

Medin, D. L., Lynch, E. B., Coley, J. D., & Atran, S. (1997). Categorization and reasoning among tree experts: Do all roads lead to Rome? *Cognitive Psychology, 32,* 49–96.

Medin, D. L., & Ortony, A. (1989). Psychological essentialism. In S. Vosniadou & A. Ortony (Eds.), *Similarity and analogical reasoning* (pp. 179–196). Cambridge: Cambridge University Press.

Medin, D. L., Ross, N. O., Atran, S., Cox, D., Coley, J. D., Proffitt, J. B., & Blok, S. (2006). Folkbiology of freshwater fish. *Cognition, 99,* 237–273.

Medin, D. L., & Schaffer, M. M. (1978). Context theory of classification learning. *Psychological Review, 85,* 207–238.

Mervis, C. B., & Rosch, E. (1981). Categorization of natural objects. *Annual Review of Psychology, 32,* 89–115.

Morgenroth, T., & Ryan, M. K. (2018). Gender trouble in social psychology: How can Butler's work inform experimental social psychologists' conceptualization of gender? *Frontiers in Psychology, 9*, 1320.

Morland, I. (2015). Gender, genitals and the meaning of being human. In L. Downing, I. Morland, & M. Sullivan (Eds.), *Fuckology: Critical essays on John Money's diagnostic concepts* (pp. 69–98). Chicago, IL: University of Chicago Press.

Murphy, G. L. (1988). Comprehending complex concepts. *Cognitive Science, 12,* 529–562.

Murphy, G. L., & Medin, D. L. (1985). The role of theories in conceptual coherence. *Psychological Review, 92,* 289–316.

Murphy, G. L., & Wright, J. C. (1984). Changes in conceptual structure with expertise: Differences between real-world experts and novices. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 10,* 144–155.

Popper, K. R. (2002). *The logic of scientific discovery*. London: Routledge. (Original work published 1959).

Potter, J. (1984). Testability, flexibility: Kuhnian values in scientists' discourse concerning theory choice. *Philosophy of the Social Sciences, 14,* 303–330.

Rivers, I. (2000). Counting matters: Quantitative research in lesbian and gay psychology. *Lesbian & Gay Psychology Review, 1,* 28–31.

Rosch, E. (1973). On the internal structure of perceptual and semantic categories. In T. E. Moore (Ed.), *Cognitive development and the acquisition of language* (pp. 111–144). New York: Academic Press.

Rosch, E. (1975). Cognitive representations of semantic categories. *Journal of Experimental Psychology: General, 104,* 192–233.

Rosch, E., & Mervis, C. B. (1975). Family resemblances: Studies in the internal structure of categories. *Cognitive Psychology, 7,* 573–605.

Rosch, E., Simpson, C., & Miller, R. S. (1976). Structural bases of typicality effects. *Journal of Experimental Psychology: Human Perception and Performance, 2,* 491–502.

Roth, E. M., & Schoben, E. J. (1983). The effect of context on the structure of categories. *Cognitive Psychology, 15,* 346–378.

Scholz, J. (2013). The possibility of a quantitative queer psychology. In K. O'Mara & L. Moorish (Eds.), *Queering paradigms III: Queer impact and practices* (pp. 239–258). Oxford: Peter Lang.

Sedgwick, E. K. (1990). *Epistemology of the closet*. Berkeley, CA: University of California Press.

Smith, E. E., & Medin, D. L. (1981). *Categories and concepts*. Cambridge: Harvard University Press.

Smith, E. E., & Osherson, D. N. (1984). Conceptual combination with prototype concepts. *Cognitive Science, 8,* 337–361.

Smith, E. E., Osherson, D. N., Rips, L. J., & Keane, M. (1988). Combining prototypes: A selective modification model. *Cognitive Science, 12,* 485–527.

Solomon, K. O., Medin, D. L., & Lynch, E. (1999). Concepts do more than categorize. *Trends in Cognitive Sciences, 3,* 99–105.

Stein, E. (Ed.). (1992). *Forms of desire: Sexual orientation and the social constructionist controversy*. New York: Routledge.

Storms, G., De Boeck, P., Van Mechelen, I., & Ruts, W. (1996). The dominance effect in concept conjunctions: Generality and interaction aspects. *Journal of Experimental Psychology. Learning, Memory, and Cognition, 22,* 1–15.

Streuli, J. C., Vayena, E., Cavicchia-Balmer, Y., & Huber, J. (2013). Shaping parents: Impact of contrasting professional counseling on parents' decision making for children with disorders of sex development. *Journal of Sexual Medicine, 10,* 1953–1960.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behaviour. In S. Worchel & W. G. Austin (Eds.), *Psychology of intergroup relations*. Chicago: Nelson-Hall.

Taylor, S. E., Fiske, S. T., Etcoff, N. L., & Ruderman, A. J. (1978). Categorical and contextual bases of person memory and stereotyping. *Journal of Personality and Social Psychology, 36,* 778–793.

Teo, T. (2010). What is epistemological violence in the empirical social sciences? *Social and Personality Psychology Compass, 4,* 295–303.

Thorne, S. (2018). *Queer concepts of romantic love: Uncovering a heteronormative bias.* Unpublished Ph.D. dissertation, University of Surrey, UK.

Tolman, E. C. (1948). Cognitive maps in rats and men. *Psychological Review, 55,* 189–208.

Turner, W. B. (2000). *A genealogy of queer theory*. Philadelphia: Temple University Press.

Warner, D. N. (2004). Towards a queer research methodology. *Qualitative Research in Psychology, 1,* 321–337.

Wason, P. C. (1960). On the failure to eliminate hypotheses in a conceptual task. *Quarterly Journal of Experimental Psychology, 12,* 129–140.

Wittgenstein, L. (1953). *Philosophical investigations*. New York: Macmillan.