Providing Expert Knowledge in an Adversarial Context: Social Cognitive Science in Employment Discrimination Cases

Susan T. Fiske[1] and Eugene Borgida[2]

[1]Department of Psychology, Princeton University, Princeton, New Jersey 08540; email: sfiske@princeton.edu

[2]Department of Psychology, University of Minnesota, Minneapolis, Minnesota 55455; email: borgi001@umn.edu

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Abstract

Quality science provides the foundation for expert testimony in court, a claim illustrated here by three established principles of social cognition frequently applied to litigation in employment discrimination cases. First, dual processes, automatic and controlled, underlie "hidden" bias. The Implicit Association Test exemplifies one controversial but scientifically tractable application of such automaticity principles. Second, encoding and attention reveal incredibly early bias. Their potential application via neuroscience in the courtroom will challenge both science and the law. Third, mental construal produces categorical representation. Legal applications show categories' tenacity despite commonsense expectations about the impact of individuating information. Psychological scientists, expert witnesses, legal scholars, legal practitioners, and organizational managers each benefit when quality science is imported into legal contexts. Normal science disagreements should not mistakenly tarnish the credibility of quality science.

INTRODUCTION

Aims

> The key to success as an expert should turn out to be the same as the key to success in science—substantial amounts of high quality research on general causation (Faigman & Monahan 2005, p. 653).

Social cognition: psychological processes of people making sense of other people and themselves; includes attention, construal, and memory, with links to affect and behavior

Adversarial collaboration: opposing sides working together by agreed criteria to specify or discover mutually acceptable evidence

Quality science underlies expert testimony in all applications of social science to law. Here we review some principles of general causation used to inform fact finders. This review illustrates the quality-science claim with three scientific principles drawn from one type of social science (social cognition research); these principles have routinely appeared in employment discrimination litigation via expert testimony, since the U.S. Supreme Court decision in *Price Waterhouse v. Hopkins* (1989). The social cognition field investigates psychological processes—how people make sense of themselves and each other (Fiske & Taylor 2008); such processes appear at the core of many legal disputes in an adversarial context. This review specifically focuses on employment discrimination because recruiting, hiring, supervising, and terminating all invoke people's images of each other. One of social cognition research's most compelling lessons for employment law has been that mere cognition can account for discrimination; a malicious mindset is not required (Fiske et al. 1991).

Using principles from social cognition research, as presented in court, the lens of expert knowledge offers a perspective on (*a*) consistency and debate in psychology, as well as legal scholarship, and (*b*) how the adversarial context exaggerates psychology's internal debates. In a more doctrinal legal debate, social framework analysis provides the court with up-to-date scientific consensus on psychological science, using established concepts and theories about general causation to understand the specific case facts at hand (Faigman & Monahan 2005, Faigman et al. 2007, Monahan & Walker 1998). The key question in this context involves the tension between general principles of psychological causation and their application in a specific case (Faigman 2008, Faigman et al. 2008, Monahan et al. 2008, Stryker 1994).[1] This is not the present focus.

Turning to our topic—social cognitive exports into the legal system—the debates illustrate issues relevant to all social sciences in adversarial conditions where the competing institutional "logics" (see Stryker 1994) of science and law may clash (as discussed below, glossing the rough, managing controversy, adversarial collaboration, and more). The conclusion returns to these specific points. More generally, we advocate a focus on science. Experts need not question each other's scientific reputations or the worth of an entire field or subfield of science; those are all too often well established. Scientific differences typically do not undermine the admissibility of the testimony as evidence. All science builds on disagreements. Rather, scientific differences go to the relative weight of the testimony: What are areas of clear consensus and what is the relative level of disagreement within the field? Always some minority perspective will emerge to disagree, but when the clear and preponderant majority agree, the tiny swarm of gadflies do not carry the day. If we focus on the science per se, expert scientists need not swat each other in public. The adversarial context has a tendency to polarize scientists and to induce us to behave

[1] In medical causation and toxic tort cases, courts routinely distinguish between general and specific causation (Faigman et al. 2007). General causation concerns whether causality between two factors exists at all, and specific causation refers to whether the phenomenon of interest occurred in a particular context. One central legal issue is whether research on general causation is relevant and admissible in a given case in the absence of proof of specific causation (Faigman & Monahan 2005). In some research domains, especially in nonmedical contexts, there may be considerable quality research at the general level that can inform the fact finder without any testimony conveying inferences about specific causation. This matter of applying the science that establishes the general phenomenon to a particular case is another key legal issue that is "endemic to the science and law connection" (Faigman 2008, p. 304). It is also a matter of considerable debate and current commentary at the science and law intersection that goes beyond the scope of the present paper (but see Faigman et al. 2008, Monahan et al. 2008).

like nonscientists, each accusing the other side of motivated imbalance. The evidence of our own science and its application in legal scholarship tells a better story, which we illustrate here, using well-established principles.

Exclusions

Because of finite space and time, we cannot cover all areas of expert social scientific testimony (for a collection of various issues involving psychological testimony, beyond employment discrimination, see Borgida & Fiske 2008). Moreover, we focus on current and future work, not history, per the *Annual Review* editors' charge. Recent *Annual Review* articles have addressed expert evidence issues more broadly defined (Saks & Faigman 2005) and more specifically defined (Lane et al. 2007b).

Overview

Our review emphasizes three established psychological principles most cited to date by expert social cognitive testimony in employment discrimination litigation:

- First, the overwhelming consensus agrees that people think, decide, and react to other people along a continuum of processes from automatic to controlled (Chaiken & Trope 1999, Fiske & Taylor 2008). The dual processes of cognition, especially automaticity, often challenge traditional legal assumptions about the hegemony of deliberate decision making.
- Second, people cope with information overload—the natural state of the environment—by selectively attending, encoding, and channeling their thoughts along established grooves. Selective attention operates far earlier than most legal and lay analysts presume.
- Third, people respond to the social environment as they construe it, not as it objectively exists. Understanding social construal requires access to the perceiver's perspective, categories, and internal representations.

As this review discusses, each of these principles challenges and moves beyond commonsense understandings, and each has informed the substantive contributions of expert testimony in contested contexts.

Other scientific principles could explicitly inform expert testimony but have not in practice done so, although we think they could (Krieger & Fiske 2006). For example, situationism, the insight that the same person behaves in utterly different ways depending on the immediate social context, is implicitly present in any expert testimony emphasizing context effects (e.g., Bielby 2003, Fiske et al. 1991, Kassin 2008, Reskin 2005, Ridgeway & England 2007), but expert testimony has insufficiently emphasized situationism as an explicit, overarching principle. Situationism's converse, dispositionalism, conveys ordinary people's overreliance on explaining other people's behavior by relying on allegedly fixed personality traits and may yet have legal implications (see Jones & Goldsmith 2005). Belonging, the importance of identifying and conforming to a group of like-minded associates, also could provide fertile ground for expert testimony. However, this review focuses on other established scientific principles that expert testimony has so far more frequently introduced into employment discrimination litigation.

Each of the next three sections in turn examines a different scientific principle from social cognition, first reviewing the science, then pertinent legal scholarship, and finally a legal application of the science in the adversarial legal context. Some debated issues are core scientific matters best resolved by science, not unique to the legal context (e.g., generalizability matters to scientists as well as to courts). Nor are the issues unique to social science testimony among other kinds of expert testimony (e.g., potentially being a hired gun matters to all expert testimony). These legal debates do not raise new scientific issues, so we focus instead on the best scientific evidence and how it appears in the courtroom. Hence, each established psychological principle, linked to legal scholarship, sets up

Encoding: transforming external stimuli to internal representations; includes attending to salient stimuli, activating accessible concepts, spontaneously interpreting inputs

Construal: interpreting ambiguous (social) stimuli via prior expectations; includes categorizing by gender, race, age; using schemata or general concepts, often abstract traits or stereotypes

a legal application involving adversarial issues when providing that kind of expertise.

Hidden biases: unexamined but misleading cognitive tendencies, such as ambiguous, ambivalent, automatic, or implicit judgments that range from partially to fully unconscious

FIRST PRINCIPLE: DUAL PROCESSES, AUTOMATIC AND CONTROLLED, UNDERLIE BIAS

Psychology of Dual Processes

> Investigators should be aware that it may be more difficult to recognize sex stereotyping when it affects an employer's evaluation of a worker's general competence . . . . Such stereotyping can be based on unconscious bias, particularly where officials engage in subjective decision making (EEOC Enforcement Guidance 2007).
>
> Both case law and commentators have referred to contemporary patterns of bias as "subtle" and "unconscious." These labels leave plaintiffs at a distinct disadvantage. Defendants will argue that courts should not hold them liable if the bias involved is so subtle that it escaped their attention. Defendants also will argue that they should not be held liable if any stereotyping that occurred was unconscious . . . . [T]hese claims . . . I call the "clueLessness defense" (Williams 2003, p. 405).

The law (along with the oft-challenged rational-person model of economics, politics, and decision making) has typically assumed that people know what they think and that their conscious thought determines their actions. Accordingly, people are most liable for their premeditated, intended, deliberate actions, but not otherwise to the same degree. Social cognition research has complicated and challenged the robustness of this approach, demonstrating a trio of insights, namely that much social thought is more automatic, ambiguous, and ambivalent than typically realized (Fiske & Taylor 2008, Lane et al. 2007a).

In bias against protected classes (e.g., race, sex, age, disability), this trio of insights has begun to influence the legal landscape. First, briefly, we address ambiguity and ambivalence. Inferential bias often operates ambiguously in that people typically favor the ingroup ("us") more than disfavoring the outgroup ("them") (Brewer 1999, Hewstone et al. 2002, Hogg & Abrams 2003). In a fixed-pie environment, of course, the zero-sum arithmetic means that both ingroup favoritism and outgroup disfavoritism equally disadvantage the outgroup. Nonetheless, the decision maker's subjective experience is to prefer "people like us," which, despite its benign feel, perpetuates homogeneous, segregated workplaces. Ambiguity of this and related kinds (Fiske & Taylor 2008, Heilman & Haynes 2008) contributes to the hidden nature of much contemporary bias. Standard legal methods of investigation and argument can establish such ambiguity; for example, an analysis of people's own reported explanations for their decisions could reveal ingroup favoritism. An expert would less likely be required to examine such statements, so it is not our focus here.

Similarly, ambivalent biases create for the decision maker a comfortable feeling of finding some good in the disadvantaged group. Ambivalent sexism (Glick & Fiske 2001) credits traditional women with being nice (even if allegedly incompetent) and nontraditional women with being competent (even if cold and hence insufferable); either way, the implication is not to hire, but the ambivalent bias salvages the decision maker's conscience and conceals the nature of the bias. Ambivalent racism (Katz & Haas 1988) tells a related story, as do ambivalent biases toward older people and disabled people (likable but incompetent) and those toward Asians and Jews (competent but not likeable) (Fiske et al. 2002). The universal features of ambivalence (Fiske et al. 2007) suggest new avenues for legal scholarship on hidden biases, but so far expert testimony has less frequently analyzed ambivalence. Also, like ambiguity, ambivalence often expresses itself in words that reveal bias, so scientific experts might less often need to testify about ambivalence. However subtle or hidden ambiguity and ambivalence may be, they are often accessible to traditional legal tools, such as the verbal analysis

of written records and depositions of decision makers.

In contrast, the automatic feature of hidden bias requires tools that appear more innovative for legal scholars and courtrooms. Psychology has reached a consensus that thinking is automatic more often than lay people recognize (Fazio & Olson 2003, Fiske & Taylor 2008). Although some decisions are deliberate and controlled, many are automatic and reflexive. Recognizing the dual nature of social cognition has required new scientific theories, methods, and evidence that have then informed legal scholarship. As this review aims to show, the automaticity of social cognition appears in innovative research that defies common sense.

Ordinary social cognition operates between the two extremes. Social perceivers can operate like motivated tacticians (Fiske & Taylor 2008), using either split-second, unconscious impressions or alternatively making more effortful, conscious, resource-consuming decisions—or along a continuum of processes in between. Research on literally scores of topics demonstrates this tactical, in-the-moment, process distinction: attitudes, person perception, stereotyping, self-regulation, affective reactions, conformity, and more (Chaiken & Trope 1999, Evans 2007). At one extreme, the fully controlled cognitive process is intentional, conscious, and effortful, drawing on a wide range of information (Wegner & Bargh 1998). This does not mean necessarily that the individual's thoughts are fully in control of that individual's actions (Wegner 2005), but people experience conscious control when a thought precedes, fits, and explains a subsequent action, whether the thought was actually causal or not. This analysis contests standard notions of control, which will doubtless trouble future legal scholars. That is, suppose people's experience of their conscious will causing their actions is instead an illusion and their behavior is controlled by the situation. To what extent are they then responsible for their actions if their experienced control is indeed illusory? This issue raises a host of troubles, psychological, philosophical, moral, and legal. We do not borrow that trouble here: Contesting the meaning of mental control is not our task this time. We offer trouble enough with the new, automatic unconscious.

IAT: Implicit Association Test

Current legal scholarship increasingly debates automatic processes and how they contribute to hidden biases. So we describe the psychology of automatic processes before turning to the legal applications. Fully automatic processes are unintentional, uncontrollable, efficient, autonomous, and outside awareness (unconscious) (Bargh 2005). The prototype is subliminal processing, at milliseconds of exposure, the so-called prime registering on the senses but without conscious awareness of either the prime or its effects on one's responses. Although subliminal perception appears most obviously in the well-controlled psychology laboratory, one should not underestimate its impact in the real world of fleeting glimpses, as highlighted next.

Conscious priming is partially automatic and unconscious, as when one is aware of a prime (e.g., the presence of a pornographic magazine) but unaware of its effects on one's responses (i.e., thinking of one's female colleagues in sexual terms; Rudman & Borgida 1995). Other kinds of unconscious or partially conscious processes (Hassan et al. 2005) include subliminal persuasion (Dijksterhuis et al. 2005), spontaneous impressions (Uleman et al. 2005), accessible attitudes (Payne et al. 2005), and unintended perception (Choi et al. 2005). Implicit biases, as revealed by the Implicit Association Test (see below), among others, provide our law-psychology application in the section after next. But in the psychological context, the IAT involves conscious perception and partially conscious associations, correlated with other responses and subsequent behavior (Greenwald et al. 2008).

Thus, psychologists share a solid consensus that people can think about other people in relatively controlled, deliberate, conscious ways—that are not necessarily more rational or unbiased. Alternatively, people can think about other people in astoundingly rapid, automatic, unconscious ways that confound attempts to ask them how they made their decisions—because

Moderator: a variable that changes the effect of interest; commonly includes context, motivation, information, and personality differences

they do not know, even if they believe they do (Nisbett & Wilson 1977). And social cognition can operate between these two extremes. Whether and when people engage in each process depends on motivation, information, and capacity (Blair & Banaji 1996, Fiske et al. 1999). The current scientific question is not the existence or impact of automatic and controlled processes but when each occurs (the moderator conditions). Science documents the moderators, whose relevance the fact finders then consider in the context of particular cases. Because automatic biases are often news to the lay perceiver, these potentially hidden biases are increasingly described by scientific experts in courtroom testimony and thereby move fact finders beyond common sense (Borgida & Fiske 2008).

Legal Scholarship on Hidden Bias

The scientific foundation for unconscious hidden bias, as the previous section discussed, has implications for various socio-legal domains, including criminal law, affirmative action, and employment discrimination law. Each of these domains, in different ways, highlights the disconnect between legal standards and psychological science showing how people view legal and policy issues through the filters of cultural cognition (Kahan et al. 2007) as well as race and gender (Borgida & Fiske 2008, Greenwald & Krieger 2006, Jolls & Sunstein 2006, Lane et al. 2007b). In the criminal law context, for example, capital sentencing outcomes are subtly but dramatically influenced by the perceived racial stereotypicality of defendants' faces (Banks et al. 2008; Eberhardt et al. 2004, 2006; Pizzi et al. 2005). The exercise of peremptory challenges similarly shows hidden racial biases, clearly deviating from prescribed legal procedure (Page 2005, Sommers & Norton 2007). And police officers' decisions to use their weapons while apprehending criminal suspects tragically reveal hidden racial biases (Correll et al. 2002, Payne 2001), which fortunately can be demonstrably reduced through appropriate interventions (Correll et al. 2007, Plant & Peruche 2005).[2]

Research on hidden bias also illuminates the controversies that for decades have swirled around the legal status of U.S. affirmative action policy (Crosby et al. 2006, Krieger 1998). Arguably, well-crafted affirmative action in employment necessarily and de facto counteracts hidden biases (Crosby & Dovidio 2008). The scientific foundation for hidden bias, based on social cognition theory and research, led Kang & Banaji (2006) to propose a nomenclature alternative to affirmative action. The new term aims to describe the design and implementation of more objective measures of social interventions (e.g., the use of structured instead of unstructured personnel interviews) that target race-based and gender-based discrimination. These fair measures of merit, according to Kang & Banaji, would enable policy makers to predict the eventual retirement of affirmative action policies:

> Fair measures that are race- or gender-conscious will become presumptively unnecessary when the nation's implicit bias against those social categories goes to zero or its negligible behavioral equivalent. For all those who praise colorblindness, this will be when we as a nation become truly colorblind, not only to visible light but also to the infrared frequencies that lurk beneath (Kang & Banaji 2006, p. 1116).

Nevertheless, the legal significance of scientific research on hidden bias remains most prominent in the arena of employment discrimination law (Krieger 2008, Krieger & Fiske 2006, Rhode & Williams 2007) and, relatedly, in family responsibilities discrimination law (EEOC Enforcement Guidance Order 915.002, Williams 2003, Williams & Segal

[2]Hidden bias also has as yet undeveloped implications for inferring motives and establishing criminal liability. If the motive was hidden, perhaps the unaware person is less liable for the criminal act. This discussion lies outside our current scope.

2003). When demonstrable economic disparities involving gender and race enter the employment litigation context, whether single-plaintiff or class-action, defendants often claim that disparities are due to actual differences in performance; they deny that hidden bias, let alone explicit stereotyping and prejudice, could have played a role. Differences in education, experience, or starting salary are generally the defendants' preferred accounts. However, when factors such as experience are statistically controlled, the disparities often remain significant (Blau & Kahn 2006, Eagly & Koenig 2008, McKay & McDaniel 2006, Roth et al. 2003).

If actual differences in performance or experience do not cause economic disparities between men and women, then what does? Hidden bias arguably accounts for many such disparities, and its scientific standing challenges the legal emphasis on intentionality embedded within antidiscrimination law (Greenwald & Krieger 2006, Krieger & Fiske 2006). Further, its firm scientific base questions whether extant federal antidiscrimination laws effectively eliminate the effects of hidden bias (Hart 2005, Jolls 2007). Nevertheless, hidden bias as an account for gender-based or race-based disparities is not without controversy, either scientifically or legally.

Legal Application of Automatic Processes: The Implicit Association Test (IAT)

Unfortunately, much of the scientific critique of hidden or implicit bias research revolves around only one (albeit, heavily used) technique—the IAT (Lane et al. 2007a,b; Nosek et al. 2007). For some critics, as the IAT goes, so goes theory and research on hidden bias. Some have questioned its psychometric standing (Blanton & Jaccard 2006). Many scientific criticisms of the IAT are discussed by Mitchell & Tetlock (2006), who also more generally question the scientific status of hidden bias research and challenge its use in the employment discrimination context. Scientifically, for example, they take issue with the idea that a quick association necessarily maps onto a person's actual beliefs. Although such scientific criticisms of the IAT merit consideration, these concerns do not override contradictory evidence (e.g., Greenwald et al. 2008), nor do they undermine the weight accorded to substantial quantities of non-IAT studies documenting hidden bias, either unconscious (Fazio & Olson 2003) or ambivalent (e.g., Glick & Fiske 2007). Among other reasons, many studies use different types of measures and find similar results (Fazio & Olson 2003, Lane et al. 2007a). Combining hidden and self-report methodologies demonstrates an impressive convergent body of evidence relevant to understanding the economic disparities in question.

Behavioral realism: a movement in legal scholarship to incorporate evidence from psychological and social sciences, instead of relying on common but untested lay and legal assumptions about human nature

Legally, some scholars have attributed the Mitchell-Tetlock criticisms of using hidden bias research in employment discrimination litigation to a dispute about normative issues rather than to scientific concerns (Bagenstos 2007). The debate, according to this position, is not whether hidden bias has scientific standing, but whether the potential scope of hidden bias, as opposed to the more narrowly construed view of bias as conscious and intentional, poses a normative challenge to current antidiscrimination law. Does existing federal antidiscrimination law, for example, need to be modified in a behavioral realism direction (that is, taking account of science regarding behavior, e.g., Krieger & Fiske 2006), or as some legal scholars (Hart 2007, Jolls 2007) have argued, does existing federal antidiscrimination law adequately protect plaintiffs and employers? What does an employer who wishes to be in compliance with such federal laws (e.g., Title VII) and avoid liability have to do to avert litigation? Many employers and some courts have expressed concerns that employers cannot avoid liability when hidden bias research is central to the employment discrimination litigation.

Can legitimate remedies minimize unchecked subjectivity and unguided managerial discretion in the job appraisal process (Heilman & Haynes 2008)? As Hart (2007) has suggested, the likelihood that employers will be held responsible for single-plaintiff

Best practices: evidence-based procedures established as most effective for improving organizational performance

Category: organizes instances into an apparently similar cluster; includes prototype as average or ideal case, exemplar as representative prior experience

or class-wide discrimination is reduced if they adopt human resources policies and practices that incorporate evidence-based best practices. Diversity training and managerial feedback designed to educate employees about hidden bias, for example, are effective practices only in those organizations where responsibility for enhancing diversity is built into the organizational structures that oversee these antidiscrimination initiatives (Hirsh & Kornrich 2008, Kalev et al. 2006).

Controversies over implicit, hidden, unconscious, unexamined, or automatic bias result in part from adversarial posturing by contributors, sometimes paralyzing its legal application, but nevertheless, these approaches are reshaping legal scholarship and doctrine (Lane et al. 2007b).

SECOND PRINCIPLE: ENCODING AND ATTENTION SHOW EARLY BIAS

Psychology of Selective Encoding and Attention

> [Expert] testimony provided a sound, credible theoretical framework from which to conclude that the presence of pictures of nude and partially nude women, sexual comments, sexual joking, and other behaviors . . . creates and contributes to a sexually hostile work environment. Moreover, this framework provides an evidentiary basis for concluding that a sexualized working environment is abusive to a woman because of her sex . . . This . . . describes behavior that creates a barrier to the progress of women in the workplace because it conveys a message that they do not belong (*Robinson v. Jacksonville Shipyards, Inc.* 1991, pp. 1505, 1523).

Encoding transforms external stimuli (pinups) into internal representations (sexualized images), but the mind's encoding processes are not as accurate as a video feed. Each stage of encoding introduces selection, interpretation, and biases. Encoding transforms perceptions within attentional focus into mental representations, attention then involves maintaining the information in the conscious mind (sometimes called short-term memory), and remembering later requires bringing stored information back (from long-term memory) to conscious attention. The neural representations initially activated during perception also activate during sustained attention and remembering (Jonides et al. 2008). In this view, pinups encourage a sexual focus on women, especially if they are rare in context (salient), by putting sex on men's minds (making it accessible), and encouraging sexual construals of female coworkers (spontaneous interpretation).

Salient people. If attentional focus determines upstream what is encoded downstream, then what determines attentional focus? As psychologists agree, salience describes properties of stimuli in context that facilitate attention (Fiske & Taylor 2008). For example, in the social contexts of most interest to the workplace, people can be salient relative to the immediate context by being novel (e.g., the only female welder among a group of male welders) or by being perceptually figural through complexity, brightness, or movement (e.g., a fidgety child in a quiet classroom). A person can be salient also relative to prior knowledge or expectations for that person's social category (e.g., behaving in stereotype-inconsistent ways) or unusual for people in general (e.g., differing physically from the norm). Finally, people can become salient by being goal-relevant (e.g., a person of the relevant sex, for someone seeking a partner), by dominating the visual field (e.g., sitting at the head of the table), or by being the object of instructions (e.g., "please keep an eye on that new guy"). These determinants of salience impact a variety of social attentional phenomena, with significant potential for impact on employment settings.

Being salient makes a person loom larger than life, and where attention goes, so goes thought. Salient individuals attract extreme evaluations and coherent, often stereotypic impressions. Salient individuals seem

disproportionately responsible for causing group outcomes. Salient people's behavior seems accessible, and other people particularly remember any dominant behavior. All this means that people who are rare (e.g., solos or tokens) will draw attention, controversy, praise, blame, and alleged responsibility and will seem especially stereotypic (Thompson & Sekaquaptewa 2002). This analysis has informed expert testimony in employment discrimination law (e.g., Fiske et al. 1991 regarding *Hopkins v. Price Waterhouse*; see legal scholarship under the third principle). The salience of a rare female welder in a shipyard also informed the expert testimony about the effect of workplace pinups on inappropriately sexualized reactions to her, as suggested in the section's opening quotation (*Robinson v. Jacksonville Shipyards, Inc.*).

Accessible ideas. People attend not only to salient people but to attention-grabbing concepts, and this too bears on psychological science and employment law. Concepts come to mind when they have been recently or frequently activated; accessibility appears in the speed and ease of retrieval (Fiske & Taylor 2008, Förster & Liberman 2007, Higgins 1996). Accessibility can be individual (people differ in their chronic obsessions) or environmental. Environmental accessibility, called priming, occurs when people encounter a stimulus (e.g., a pinup calendar) that primes a concept (women and sex) that they then more readily apply to the next relevant target (a female coworker). Accessibility has the most impact when primes fit in both meaning and evaluation; that is, an attractive pinup primes behavior toward a liked female colleague. Gender-role stereotypes are primed this way, especially for individuals predisposed to respond. For example, male research participants viewed a pornographic film, and then the more sexist among them responded more sexually to an attractive woman they encountered in an apparently unrelated context (McKenzie-Mohr & Zanna 1990); stereotype-reinforcing music videos have similar effects (Hansen & Hansen 1988). Racial categories too can be primed: When whites see race-related words, even subliminally, they later respond more rapidly to race-related terms and interpret ambiguous behavior in terms of their racial stereotypes (e.g., Devine 1989, Dovidio et al. 1986, Gaertner & McLaughlin 1983). Overt racial slurs also can prime negative evaluations (Greenberg & Pyszczynski 1985). Priming work-irrelevant concepts, especially when they reinforce stereotypes, has consequences for employment discrimination.

Accessibility primes not only concepts but also behavior, and in two ways. First, priming a concept cues related behavior, as when undergraduates primed with "elderly" concepts later walked more slowly to the elevator (Bargh et al. 1996), or those primed with "professor" performed better on Trivial Pursuits (Dijksterhuis & van Knippenberg 1998), or those primed with young black male faces responded more hostilely to provocation (Bargh et al. 1996). The priming of behavior occurs across a variety of concepts and levels of consciousness from subliminal to fully conscious. This has implications for people reciprocating stereotypic behavior, thereby creating a behaviorally confirmed belief (e.g., a hostile interracial interaction). A variety of factors beyond our current scope determine whether the prime cues consistent behavior (assimilation) or complementary behavior (contrast) (Förster & Liberman 2007).

A second form of behavior priming occurs when people already have a goal in mind. For example, the goal of commuting primes bicycles, but only for those who bike to work (Aarts & Dijksterhuis 2000). Priming sex makes men but not women more aggressive, presumably because of gender differences in experiences with sex (Mussweiler & Förster 2000). Thus, female pinups would prime sexual harassment in men but not in women. Goal-priming influences behavior only under some circumstances: if people already link the goal and behavior, if they are motivated, if the behavior is appropriate in context, and if no competing goals interfere (Förster & Liberman 2007). Note that goals typically prime behavior via relatively automatic processes.

Spontaneous interpretation of faces. People interpret other people's faces unintentionally (Macrae et al. 2005). At the earliest stages of encoding, people judge each other's faces by incredibly fast first impressions that stick. Two apparently universal dimensions inform these social cognitions (Fiske et al. 2007): (*a*) Warmth answers the query "Are you with me or against me?" If apparently allied, people are judged trustworthy, friendly, and well intended. (*b*) Competence answers the query "Can you enact your intentions?" Apparent competence implies agency, capability, and status. Both relate to employment decisions.

People make these judgments from faces in less than a twentieth of a second (Willis & Todorov 2006). Warmth judgments correspond to faces that most people agree look subtly happy instead of subtly angry (Engell et al. 2007, Todorov 2008, Todorov et al. 2008), and competence judgments correspond to faces that look more mature instead of baby-faced (Zebrowitz & Montepare 2005). Spontaneous encoding also inextricably links people's behavior to their faces (Todorov et al. 2007). All these processes activate a few fairly predictable brain regions (e.g., Frith 2007), arguably for evolutionary reasons (Cosmides & Tooby 1989; Cosmides et al. 2005; Rilling et al. 2002, 2004; Walter et al. 2005).

Spontaneous first impressions of warmth and competence have substantial consequences. For example, the candidate with the more split-second competent face more often wins elections (Todorov et al. 2005) and probably jobs. Of the two universal dimensions, competence is a slightly slower, lower-priority judgment than warmth but still incredibly fast (e.g., Willis & Todorov 2006; T.E. Hack, S.A. Goodwin, S.T. Fiske, manuscript under review). Although this work has yet to impact legal scholarship, it would argue against pinning photographs to resumes (even apart from the racial issues raised). It would also argue for well-defined job criteria, assessed as objectively as possible, to help avoid these encoding biases (as suggested by Heilman & Haynes 2008).

Legal Scholarship on Selective Encoding and Early Bias

In *Jenson v. Eveleth Taconite Co.* (1993), the first U.S. federal class-action sex discrimination and sexual harassment case, one of the key issues (as in the *Robinson v. Jacksonville Shipyards Inc.* case discussed above) involved how pervasive sexual graffiti in the workplace affected the behavior of male iron ore miners toward the few women miners at the Eveleth, Minnesota, plant (see Bingham & Gansler 2002). Expert testimony using a social framework analysis was admitted in the *Jenson* case. Social cognition research on the environmental conditions that prime gender stereotypes in social perception and behavior (Bargh et al. 1995, Fiske 1993, Fiske et al. 1991, Fiske & Stevens 1993, Rudman & Borgida 1995) provided a strong, empirically based explanation for how and why sexually harassing behaviors might occur in a workplace with sexualized imagery where women miners held solo status in the midst of men, many of whom held traditional views of gender roles. In his ruling in favor of the plaintiffs, the federal judge made reference to the expert testimony introduced at trial that was reminiscent of the ruling in *Robinson v. Jacksonville Shipyards, Inc.* (1991)—that the testimony provided "a framework for understanding why consistent and pervasive acts of sexual harassment occur in work environments similar to Eveleth Mines."

Legal Application of Encoding and Early Bias: Neuroscience in the Courtroom

> Developments . . . at the forefront of social cognitive neuroscience . . . hold considerable promise for exploring the various nonconscious processes that researchers are beginning to study in organizational contexts . . . . Recent advances in social cognitive neuroscience . . . are providing vital signposts (Hodgkinson & Healey 2008, pp. 403, 405).

Neural signposts to prejudice have been particularly provocative. People's brains respond

to another's race and gender, extracting this information preconsciously as early as a tenth of a second (Cloutier et al. 2005, Ito & Urland 2003). As noted, these neural early warning systems inform racial biases in simulated shoot/no-shoot responses (Correll et al. 2006).

People's brains are biased in their processing of other-race faces: They remember same-race faces more easily, and this correlates with activity in the fusiform face area (Golby et al. 2001), which would help explain cross-race inaccuracy in eyewitness memory. Racial stereotypes about criminality affect early visual processing, especially for visually typical racial appearance (Eberhardt et al. 2003, 2004). Prototypical racial appearance predicts harsher sentences in capital crimes, even controlling for relevant mitigating and aggravating features of the crime (Eberhardt et al. 2006). Extrapolating to employment contexts, neuroscience evidence linking perceptions of black men to criminality may help explain sociological data showing that employers conflate race and criminality in their hiring decisions, even when they report that they would not (Pager 2003, Pager & Quillian 2005).

Individual differences in whites' prejudice, assessed by the IAT and by eye-blink indicators of vigilance, correlate with amygdala (vigilance) responses to unfamiliar black male faces (Amodio et al. 2003, 2004; Cunningham et al. 2004; Hart et al. 2000; Lieberman et al. 2005; Phelps et al. 2000; Wheeler & Fiske 2005). Neural patterns do not indicate hardwired prejudice; cultural influences leave neural traces, expressed to varying degrees. The cited studies demonstrate a range of moderator conditions: individual differences in motivation, calming effects of familiarity, and reversals due to social context. Nevertheless, one could imagine a nightmare scenario wherein human resources managers are invited to take an fMRI scan, to assess whether they react negatively to people of another race. This approach would be blatantly misguided, as we argue below.

Interracial encounters are emotional minefields for many whites. Whites inexperienced at interracial interactions show physiological signs of threat and minute facial movements indicating bias (Blascovich et al. 2001, Mendes et al. 2002, Vanman et al. 1997). Their anxiety interferes with their own subsequent performance on irrelevant tasks (Richeson & Shelton 2003, Richeson & Trawalter 2003) and leaves neural traces (Amodio et al. 2004, Cunningham et al. 2004, Lieberman et al. 2005, Richeson et al. 2003). Again, these phenomena could easily apply in the workplace.

FRE: Federal Rules of Evidence

Organizational and social psychologists are not alone in exploring the implications of neuroscience relevant to employment settings; legal scholars also are on the case (e.g., Annas 2007, Garland 2004).[3] Many of the issues involve rules of evidence for admitting expert witnesses because experts always will be involved in introducing neural evidence. But neuroscience also raises issues related to, for example, the Fifth Amendment.

Under the Federal Rules of Evidence 702 (2004), as interpreted by *Daubert v. Merrell Dow Pharmaceuticals* (1993) and its progeny, a witness qualified as an expert may testify "if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case." The key FRE 702 issue for neuroscience is reliability. Neuroimaging data, for example, are not as objective as they seem. Neuroscientists have leeway to choose

- a task for subjects to engage in the scanner, whether it be recognizing faces (e.g., European American and African American young men) or taking the IAT; imaging results depend entirely on the mental set while viewing the images (Wheeler & Fiske 2005).
- levels of statistical sensitivity, for which this new science has not yet settled conventional probability and replicability

[3] But this more general work is outside the scope of this review (see the MacArthur Foundation's project, for example, on decisions to commit crimes and decisions about societal responses to crimes, **www.lawandneurosciencesproject.org**).

values. The chosen statistical threshold sets the level of detecting activation; given a low enough threshold, masses of brain areas would appear active, but given a high enough threshold, virtually nothing would seem active.

- comparisons, relative to which the focal brain areas are active. For example, one might compare activations to black versus white faces, or black faces compared with a resting state, or black faces compared with nonhuman faces. Each would answer different questions, so the statement "activated to black faces" demands the question "compared to what?"
- the focus of the reports. Even in the most conservative neuroimaging reports, many extraneous brain areas activate, and neuroscientists often adopt a convention of focusing on those areas of immediate theoretical interest and then merely listing myriads of others in a table, without comment.
- how to interpret the meaning of activations. No single brain region does just one task. Brain regions are implicated in multiple tasks, and each task operates in systems of activation, not as isolated hot spots.
- which prior research one chooses to help interpret these patterns. Many results do not yet replicate, so cited research can deeply alter the apparent meaning of the neural data.

In short, the analysis involves a lot of decisions—some premature, some unwarranted, some methodologically flawed, and only some reliable (Baskin et al. 2007, Tancredi & Brodie 2007).

What is more, the methods are best suited to reporting results averaged over many participants' brains, rendering them less useful for diagnosing individuals (except in medical searches for brain damage or anomaly, but these are more likely to apply to criminal cases than employment decision making). Just as evidence from the IAT is not yet reliable for diagnosing the stereotypes held by a unique individual, so too neuroimaging data have not been validated as a reliable individual indicator of prejudice or truth-telling.

What if neuroscience does reach standard legal criteria of reliability? (If it does not, then its legal usage should go the way of the polygraph, which was demolished by a National Research Council report in 2003; see Iacono 2008). If neuroscience is introduced, then FRE 403 addresses the potentially unfair or prejudicial impact of certain kinds of expert testimony. FRE 403 states that evidence "may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence." Neuroimaging data seem particularly compelling to lay people and may present a "unique danger because of the appearance of scientific neutrality" (Baskin et al. 2007, p. 250). So, consider

> what would happen if the science of truth detection by brain imaging reaches a stage of development where even skeptical judges have to admit that reliability concerns have been sufficiently addressed. Would courts still refuse to admit this evidence, perhaps under FRE 403? What role would remain for the jury if scientists agree that credibility determinations could be made much more accurately by machines than by people? What would trials look like? Indeed, would there be any need for trials at all? (Pettit 2007, pp. 333–34)

Finally, neuroimaging data raise the issue of self-incrimination (Thompson 2007). Neuroimaging could appear in two venues, one as an elaborate lie detector. In this venue, the subject has the right to refuse the test, although the evidentiary status of the refusal might be equally or even more damaging.

In the other neuroimaging venue, the evidence might seem more of a physical nature, like a blood test or a lineup. The government can compel people to provide such evidence in criminal cases. For example, if exposure to physical images of certain kinds of people

activates brain regions associated with disgust (insula) or fear (amygdala), this arguably does not read the subject's mind but instead provides physical evidence consistent with certain emotional states. Unfortunately, it is precisely this kind of nonspecific arousal state that lie detectors diagnose, so brain imaging is a very expensive nonimprovement.

Further, fMRI uses the brain in a different way than forensic sciences use other body parts and traces (Pettit 2007). The convenience of separating impermissible verbal self-incrimination from presumably permissible physical self-incrimination is not so clear-cut in the case of fMRI,

> given the high value this country, and the common law generally, places on personal freedom in general and freedom of thought in particular. Similarly, with respect to the Self Incrimination Clause, although the current approach, with its strong dichotomy between physical and communicative evidence, seems to suggest that fMRI, as a tool that collects physical evidence, is benign, this same tradition ultimately acknowledges that the physical and the mental cannot be so cleanly separated (Thompson 2007, p. 354).

Other commentators similarly note:

> If the courts focus on the communicative act involved in garnering the evidence, the control the suspect has over the results, and concerns about reliability of the testimony, they would likely find that [neural lie detection] falls outside of the Fifth Amendment's scope. If, however, they focus on the communicative product and the violative nature of entering the suspect's mind, they would likely find [neural lie detection] to fall within the amendment's bounds (Stoller & Wolpe 2007, p. 374).

Other commentators (Baskin et al. 2007, Greely 2004) and the popular press (Rosen 2007) have worried about these issues. Indeed, maybe the issues are not for neuroscientists to resolve: "Even with further advances, neuroscience will supplement but not entirely supplant existing criteria of responsibility within moral and legal domains" (Baskin et al. 2007, p. 269). As other commentators note, "the map is *never* the territory; the fMRI scan is not the same as the brain it scans" (Greely & Illes 2007, p. 420).

Regarding encoding and early bias, people's captured attention, primed accessibility of ideas, and spontaneous interpretations of faces all produce early biases documented by data ranging from neuroimaging to workplace behavior, but some methods are more established than others.

THIRD PRINCIPLE: MENTAL CONSTRUAL PRODUCES CATEGORICAL REPRESENTATION

Psychology of Construal

> Changes in cognitive representations can aid organizational adaptation . . . , yet ingrained schemata can constitute barriers to organizational and industrial change (Hodgkinson & Healey 2008, p. 400, describing Bogner & Barr 2000).

People must adapt to their environments using construals, that is, creating mental representations, but these representations also persist, sometimes maladaptively, according to modern cognitive and social psychology. Applied to the current review topic, expert knowledge in employment cases, the most frequently described schemata are stereotypes about social groups. This raises accuracy issues, beyond our scope here; group differences and their interpretation are controversial (Hodgkinson & Healey 2008, Hough & Oswald 2000, Sackett & Lievens 2008), but space does not allow that complex discussion.

Social categories—primarily gender, race, and age—organize people's construals of each other from the first moments, as this review has shown (Fiske 1998). Category-driven processes comprise the more automatic forms of encoding, representation, and response. This

section focuses on such representations. Prototypes theoretically represent the canonical category member, averaged from experience with instances, or the ideal category member, abstracted from the category's prescriptive norms (for reviews, see Fiske & Taylor 2008, Smith 1998). Additionally, categories can comprise remembered exemplars, concrete instances that are consulted in order to generalize about the category as a whole. Most often, the studied categories have been at the most general, broadest levels, such as females versus males.

Increasingly, however, research has focused on more nuanced subgroup perception (e.g., housewives versus professional women). On the surface, a researcher or consumer of this approach might despair, imagining the impossibility of systematically analyzing people's miscellaneous reactions to myriad subcategories. Fortunately, fundamental dimensions emerge that account for most of the variance in intergroup and interpersonal perception (see Fiske et al. 2007 for a review). As noted above for interpersonal perception, two primary dimensions are the other groups' perceived warmth (friendliness, trustworthiness) and perceived competence. The simple space created by crossing these two orthogonal dimensions generalizes across cultures, suggesting some basis of universality.

Subgroups of women, for example, are stereotyped as warm but incompetent (e.g., housewives, older women) or as competent but cold (e.g., professional women, feminists) (Cuddy et al. 2004, Eckes 2002). These opposite poles for contrasting subgroups represent the ambivalence described above, as one of three aspects of hidden biases, along with automaticity and ambiguity. Warmth-by-competence space also describes subtypes of gay men (Clausell & Fiske 2005). Stereotypes of specific groups, such as older adults (warm but incompetent; Cuddy et al. 2005) and Asian Americans (competent but not warm; Lin et al. 2005) also differentiate according to this model. Although disadvantaged social class is not a protected legal category, this model indicates that extreme poverty is the single most stigmatizing condition (Fiske et al. 2002). Homelessness even has its own neural signature, consistent with dehumanizing homeless people and feeling disgust (Harris & Fiske 2006, cf. Krendl et al. 2006 on dehumanizing extreme obesity, piercings, ugliness, transsexuality). Analyzing extreme forms of prejudice matters because, under the wrong conditions, dehumanized outgroups can suffer extreme behavior, such as passive neglect at best and active attack at worst (Cuddy et al. 2007), perhaps even torture (Fiske et al. 2004).

When people do not treat each other categorically, they may individuate, examining the other in more detail, according to some theories (Brewer & Harasty-Feinstein 1999, Fiske et al. 1999). Even the neuroimaging evidence fits the idea that appropriate motivations can rehumanize a discredited other (Harris & Fiske 2007, 2008). Here again, moderators matter: motivation, information, and capacity.

Legal Scholarship on Mental Construal

In one already noted sex discrimination case, *Price Waterhouse v. Hopkins* (1989), involving Title VII of the Civil Rights Act of 1964, the attorney for Ann Hopkins, the plaintiff, deposed a male partner at the firm and asked what advice he had given her to strengthen her case for partnership. His response, in part, which he offered sympathetically, was that she needed to "walk more femininely, talk more femininely, dress more femininely, wear makeup and jewelry" (Hopkins 2007, p. 62). This comment, which has received widespread scholarly and media attention, highlighted Hopkins's claim of gender stereotyping as a form of sex discrimination. Hopkins was seen as competent but cold (Fiske et al. 2007), in effect eliciting hostile sexism (Glick & Fiske 2001).

Since the U.S. Supreme Court upheld Hopkins's claim that she was unlawfully denied a partnership at the accounting firm Price Waterhouse, a number of other single-plaintiff and class-action cases have claimed gender stereotyping. In all these cases, the courts have admitted testimony by experts who were qualified to

explain the psychological dynamics of stereotyping and the conditions under which it is more or less likely to occur.[4] Moreover, not only has the psychological science on gender stereotyping moved from research journals into judicial opinions, but our electronic search through the *Index to Legal Periodicals and Books* since *Price Waterhouse v. Hopkins* suggests that the case, and its treatment of psychological science, also has spawned scores and scores of law review and law journal articles on a wide range of related legal and policy issues.

Whereas the inclusion of psychological science in legal opinions and its influence on doctrinal scholarship in the law may be relatively recent, the research on stereotypes such as gender reflects an established, mature area of social and psychological science (Fiske 1998, Fiske et al. 1991, Hunt et al. 2002). To be sure, concerns have surfaced in the context of litigation as well as in the research literature about (*a*) the external validity of experimental science on gender stereotyping (Copus 2005, Landy 2008b) and (*b*) whether the relevant science should or is even able to proffer specific as well as general claims of causation in a given case (Faigman 2008).[5] But several reviews of the scientific literature on gender stereotyping have identified areas of scientific agreement and disagreement that unquestionably provide evidence-based insights into the complex and nuanced nature of gender stereotyping and prejudice (Borgida et al. 2005, Eagly & Karau 2002, Glick & Fiske 2007, Hunt et al. 2002).

Legal Application of Mental Construal: Individuating Information

Individuating information: cues that distinguish an instance from its category, going beyond apparently or stereotypically shared characteristics

One such area of scientific agreement with regard to gender stereotyping pertains to the role that individuating information (e.g., information about a specific woman) plays in understanding stereotypical thinking. As research has shown, when forming initial impressions of a woman, people frequently rely more on their stereotypes about women in general than on individuating information about the specific woman (Borgida et al. 2005, Fiske & Taylor 2008). In other research, gender stereotypes not only strongly influence judgments of women, but especially when women behave in counterstereotypic ways (Parks-Stamm et al. 2008; Rudman 1998; Rudman & Fairchild 2004; Rudman & Glick 1999, 2001). Nevertheless, the role of individuating information may be among the most scientifically complex aspects of the science on gender stereotyping (Borgida et al. 1995). And, as Rudman et al. (2008) have argued, the use of individuating information is also among the most intuitively challenging set of findings on gender stereotyping because common sense expects stereotypes' influence to diminish whenever people know specific, personal information about an individual woman.

But, as the Rudman et al. (2008) review of the pertinent scientific literature also suggests, however intuitively plausible, the notion that individuating information always trumps gender stereotypes oversimplifies and contradicts the preponderance of scientific research on the question.

Research reviewed by Rudman et al., as well as by others (Fiske & Taylor 2008, Hunt et al. 2002), has shown that stereotypes (*a*) dominate impressions in the absence of individuating information or when the available individuating information is ambiguous, and (*b*) are weakened or diluted mainly when the individuating information about a specific

[4] *Butler v. Home Depot, Inc.* 1997; *Dukes v. Wal-Mart, Inc.* 2004; *Jenson v. Eveleth Taconite Co.* 1993; *Beck v. Boeing Company* 2001; *Robinson v. Jacksonville Shipyards, Inc.* 1991; *EEOC v. Morgan Stanley & Co.* 2004; *Hurst v. F.W. Woolworth Co.* 1997; *Int'l Healthcare Exch., Inc. v. Global Healthcare Exch.* 2007. To date, admissibility of expert testimony on gender stereotyping has been overturned in only one or two instances (e.g., *Ray v. Miller Meester Advertising, Inc.*, 2003).

[5] Courts that have had to contend with concerns about external validity and other methodological or measurement critiques associated with the scientific database in question have typically concluded that such questions about the science go to the weight of the testimony and not to its admissibility (see *Shelley Hnot, et al. v. Willis Group Holdings, Ltd.* (2007), Opinion and Order on motion to exclude plaintiffs' expert testimony).

individual is clear and unambiguously relevant to the judgment criterion (e.g., when, say, a female candidate for a managerial position is specifically described as a successful and unambiguously qualified manager). Gender stereotypes, in other words, "are remarkably resistant to individuating information" (Rudman et al. 2008). For example, if the individuating information is at all ambiguous, perceivers may interpret it in stereotype-consistent ways that further confirm the stereotype. And as Rudman's (1998, Rudman & Fairchild 2004) research on perceptions of counterstereotypic women demonstrates, even if perceivers use the available individuating information and see a woman as atypical, they may nonetheless harshly evaluate and effectively punish her atypicality for violating the prescriptive aspects of the culturally shared gender stereotype.

As psychological science indicates, people often construe others in terms of general stereotypes simply because perception cannot occur without construal, and categorization is a favored social cognitive tool. Even individuating information does not reliably undermine categories, which resist disconfirmation. To paraphrase a prescient social psychological sage, people cannot think without the aid of categories; orderly living depends on it (Allport 1954). However, given sufficient motivation, information, and capacity, people demonstrably can override their convenient categories. That is, when people work with people who differ from them on group memberships, they can get along if their contact is equal status in context, authority sanctioned, nontrivial, and interdependent (Pettigrew & Tropp 2006). In other words, put on the same team, people can go beyond their stereotypes by attending to their teammates' counterstereotypic attributes (Fiske 2000).

CONCLUSION

The framework we present focuses on what happens when quality science moves to the adversarial legal setting. Three principles have especially informed expert testimony in employment discrimination cases. Impressions of others operate via (*a*) dual processes, especially more automatic processes; (*b*) incredibly early biases in encoding and attention; and (*c*) mental construal shaping categorization. Other principles also underlie social cognition—for example, the importance of the situation and motivations to belong to social groups—but to date they have had less impact in litigation contexts.

According to the first principle, hidden biases revealed by measures of automatic (versus more conventional controlled) processing, this review finds that the science is mostly robust, revealing rapid associations that are at least culturally based and often linked to stereotypes, prejudices, and discrimination. These automaticity approaches should, we believe, inform legal understanding of bias, but they should not be used to diagnose individual decision makers. We believe that the research programs will sooner rather than later empirically underscore the scientific status of general principles of hidden bias. Therefore, individuals are not in the best position to notice bias, but larger entities can monitor patterns attributable to their cumulative impact. Thus, organizations need to be on notice, responsible, and forthcoming in their records of managing diversity: Unexamined or not, hidden bias has potential best-practice remedies (Fiske & Krieger 2009).

Reviewing the second principle of early bias, we see that selective encoding is inevitable—as both the cognitive and neuroscience data indicate—though the downstream usage of it is not. People's goals, values, and social contexts affect even the earliest moments of encoding, as exemplified in the priming research, and of course what people do after their immediate response. Therefore, by providing appropriate goals and motivations, organizations can have an impact from the first milliseconds of social interpretation, a robust finding that flies in the face of commonsense understanding.

Turning to the third core principle, people spontaneously think with the aid of categories. Social cognition is social construal into categories. Even individuating information does not as readily influence social cognition

as common sense might think. However, here as elsewhere, social perceivers are exquisitely attuned to the interaction context, adjusting their long-term strategies and on-the-spot tactics. Accordingly, organizations can provide the necessary motivation, information, and capacity, informed by quality science.

The evidence behind all three core principles represents an essential scientific consensus that provides a firm basis for export to legal settings. The adversarial context magnifies the significance of this needed consensus. Although internal criticism and debate drive normal science, the role of consensus in an adversarial context creates a cultural clash. In the legal system, disagreement, even in a minority voice, carries weight according to the apparent logic of its arguments and its support by precedent. In science, disagreement carries weight according to its peer-reviewed publication and its support by additional research. That is, in the legal case, the weight of the evidence is more affected by appeals to reason and supportive precedent, whereas in the other case by quality science and overturning of precedents (scientific progress) (Krieger & Fiske 2006). So the key question that arises is how to reconcile the two cultures.

At a minimum, disagreement among scientists should not be misconstrued as a basis for dismissing the science. Established science works through disagreements to eventual consensus. In practice, sometimes scientific disagreement in the adversarial context does paralyze the testimony, raising questions about its admissibility. Sometimes, however, scientific disagreement does not even enter the legal debate, but it should indeed influence the weight of the testimony—if and only if that disagreement comes from peer-reviewed, empirically based dissent. Commentaries, including law review analyses that are based on the pertinent peer-reviewed science, may expose flaws or gaps in the science or its usage, and they have found their way into expert testimony. But such reviews do not provide new empirical data that scientifically validate their criticisms, nor do they contest the data with other data, the currency of scientific proof. Whatever the published venue, data-free opinion is not a substitute for direct scientific evidence, nor should it have any place in expert testimony that is introduced to establish general causation. The quality of the science should determine its weight, not its admissibility. The scientific evidence should go to the weight of the matter. Let the adversary context aim to be the engine of truth. Even in less adversarial, alternative dispute resolution, such as arbitration and mediation, the relevant science depends on its peer-reviewed quality.

What do psychological scientists, expert witnesses, legal scholars, and legal practitioners do in the interim? For social scientists, serving as experts or not, the adversarial context can raise vital intellectual issues and, perhaps contrary to their instincts, enrich the science. For example, the adversarial context typically forces basic scientists explicitly to address generalizability from laboratory to field settings (for examples, see Borgida & Fiske 2008, Landy 2008a). Laboratory experiments, on the one hand, have high internal validity—that is, they excel at demonstrating causality—but they are agnostic about external validity—that is, generalizability to other settings. Correlational analyses, on the other hand, can describe relationships in representative samples but cannot establish causation. Contrary to many people's intuitions, real-world effects are often stronger than laboratory effects that strip the phenomenon of extraneous, confounding factors (Borgida & Fiske 2008). In the end, the convergence of experimental and correlational evidence builds the strongest case.

At best, the experience of testifying can influence the basic research directions taken by scientists (e.g., Fiske 1993), sometimes focusing on more applicable basic science. Scientists' research agendas also may generate expert surveys to assess consensus in the field, as a result of issues raised in scientific testimony (e.g., Kassin et al. 1989). Conducting meta-analyses is another more conventional, normal-science approach to gauging consensus (Eagly & Koenig 2008). An unconventional scientific process is adversarial collaboration (Kahneman

2007, Mellers et al. 2001), in which opposing viewpoints share authorship of a literature review or even an agreed-upon critical experiment. Absent the surveys of experts, meta-analyses, and adversarial collaborations, narrative literature reviews in peer-reviewed outlets assess the preponderance of evidence; such articles may reflect the crossover between science and court (as in this *Annual Review* series).

The adversarial context also raises ethical issues for scientists, especially if the context influences experts to gloss over rough spots—the significant flaws or disagreements in the science. Presumably, the adversarial context also uncovers these biases. Finally, the adversarial context raises professional issues within the field if scientists attempt to destroy each other's reputations or engage in *ad hominem* attacks because of differing opinions on the science or its introduction into court.

For legal scholars, expert testimony on psychological science provides an intellectual goldmine, as shown by the law review articles cited here and elsewhere. Many of these articles focus on the appropriate admissibility and weight of testimony. Other articles create interdisciplinary awareness of the workings of normal science, for example, the presence of multiple sources of knowledge and the reality that no one source is perfect. Most important, perhaps, as a message from psychologists to the law: Mature science tolerates some inconsistency as normal science, but reliable methods can evaluate the validity of the dissent, as well as the consensus.

For judges, the differing cultures and standards of the courtroom and the laboratory raise potential issues relevant to decisions about admissibility and weight. As gatekeepers governed by *Daubert* and its legal progeny, judges' knowledge of normal science can inform those opinions. The longstanding idea of neutral science experts advising the court (Saks & Faigman 2005) remains appealing as a way of educating fact finders, but in practice such variations on the science-court theme have not yet appeared.

Finally, for legal professionals, this review suggests some guidelines for how to use (and not use) expert testimony in psychological science, especially social cognition in employment discrimination cases. We endorse the use of such testimony as a social framework, providing the best scientific context for understanding the minds of people making sense of each other. Scientific expert witnesses can provide the general scientific background, whose relevance they can best communicate with illustrations selected from the particular case. Lawyers can then argue the applicability of the general science to the particular case. In the end, going beyond disputants' and fact finders' commonsense understandings can only illuminate the likely truth of contested legal matters, in court as well as in science.

SUMMARY POINTS

1. Expert testimony fundamentally requires quality science that establishes at least general causation.
2. Dual processes, automatic and controlled, underlie bias, although lay observers often think most decisions occur deliberately.
3. Encoding and attention show incredibly early and hidden bias.
4. Mental construal (interpretation) tends to produce categorical representations.
5. The adversarial context often polarizes scientists, undermining the admissibility of science rather than addressing the weight of the testimony.
6. Disagreements inhabit normal science, so experts and fact finders must weigh the consensus without assuming that any minority critique necessarily discredits.

7. Hidden bias suggests novel, feasible, best practices for organizations, rather than implying unfounded accusations of responsibility.

FUTURE ISSUES

1. Fact finders may want to revisit the appealing idea of the court's neutral expert.
2. Scientists may want to undertake adversarial collaborations that involve opponents' making explicit their areas of agreement, disagreement, and the potentially most relevant evidence, whether literature review or critical experiment.
3. Social cognitive neuroscience will increasingly enter the courtroom as evidence of hidden bias, but it should not be used to diagnose individual decision makers because it currently carries flaws similar to polygraph evidence.
4. Organizations will increasingly be held accountable for hidden biases, but best practices can focus on monitoring, documenting, and motivating diversity.
5. The importance of situationism—the same person behaving differently depending on context—will more explicitly come to the forefront of expert testimony.
6. The motivational importance of belonging to one's social groups, conforming and being influenced, will increasingly matter in expert testimony about decision making.
7. Hidden bias research and its implications for antidiscrimination law will become an increasingly visible area of law and social science scholarship.

DISCLOSURE STATEMENT

Susan T. Fiske has served as an expert witness, primarily for plaintiffs, in employment discrimination cases, although she has not served in this role for five years and no longer expects to serve in this role, except under extraordinary circumstances. Eugene Borgida has served as a paid expert witness on behalf of several plaintiffs and defendants in single-plaintiff as well as class action lawsuits (since 1989). He has also advised the EEOC on the use of social science evidence in Title VII civil rights cases involving sex discrimination (1995–1999). Both authors have recently published an edited volume, *Beyond Common Sense: Psychological Science in the Courtroom*, from which they receive minimal royalties as editors.

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