HABITS OF MEANING: WHEN LEGAL EDUCATION AND OTHER PROFESSIONAL TRAINING ATTENUATE BIAS IN SOCIAL JUDGMENTS

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Dedication

This dissertation is dedicated to my parents, Jim and Georgia Girvan, who taught me the value of education and gave me the courage to pursue it.

Abstract

Social-cognitive theory explains the persistence of social bias in terms of the automatic placement of individuals into social categories, the function of which is to conserve cognitive resources while providing a basis for some (even if inaccurate) inferences. Within that paradigm, bias attenuation involves transcending social categorization through effortful individuation. Research on learning and expertise supports an alternative perspective: That training to categorize entire situations using, e.g., legal rules, their implications, and associated responses, can attenuate bias in social judgments by displacing or reducing the need to rely upon social categorization. The Competing Category Application Model (CCAM), a novel model of the effects of expertise on use of social stereotypes in judgment and decision-making, is proposed and tested. The results of three experimental studies provide strong evidence for CCAM. Across the studies, the liability decisions of untrained participants, participants trained on unrelated legal rules, and participants trained on indeterminate legal rules were consistent with the use of social stereotypes. By comparison, such stereotypes did not affect the decisions of trained participants who were applying determinate legal rules. Implications of the results and for future directions are discussed.

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Chapter I: Introduction

> He that is good with a hammer tends to think everything is a nail.
>
> -Abraham Maslow

> If you are good with a hammer, you may tend to think everything is a nail—but that may also mean you're less likely to end up screwing someone.
>
> -E. J. Girvan

While jogging in a remote area of a large park one afternoon, Tyrone White, a 6' 2'', 195-pound tri-athlete, comes upon a child drowning in 3 feet of water. He does nothing to save her. While walking over an inner-city bridge on her way home from a new job late one night, Tiffany Baker, a recent college graduate, hears the drunken cries of a homeless man from the water below. She does nothing to save him. Under a well established (albeit ethically controversial) common law doctrine, because the experienced athlete and the young women did not cause the risk of harm or have a special relationship with the child or homeless man, respectively, neither has a duty to act and thus neither can be held liable for their inaction in preventing the drowning deaths (American Law Institute, 2011). The location, time of day, and ease of rescue are legally irrelevant, as are the relative competence, physical size, race, ethnicity, and gender of those involved.

Rosemary Anderson, recently widowed, lets the ex-convict, who just moved from a half-way house into the apartment above her garage, borrow a ladder to hang some lights. Unbeknownst to her, the ladder is prone to collapse. It does so and the man is seriously injured. Golden Gopher Tools, Inc. sells a circular saw to a young couple who

are converting the den of their newly-purchased home to a nursery for their expected baby. Unbeknownst to anyone at Golden Gopher Tools, a guide screw on the saw does not work. As a result, the pregnant wife loses three fingers when the saw blade detaches. Under a well established common law doctrine concerning liability for ultra-hazardous activities, both Ms. Anderson and Golden Gopher Tools, Inc. are liable for the injuries caused by the ladder and saw, respectively. Again, the amount of resources, sophistication, age, gender, and parental status of those involved are legally irrelevant (American Law Institute, 2010). Justice is blind, and, as to many salient social features of a situation, often so is the law.

What is the psychological effect of immersing oneself in the study of policies, standards, and rules that are divorced from common social understandings? Does it desensitize students of tort law to injuries, maiming, and death, making them less emotional and perhaps less sympathetic to suffering (Dickert, Herbig, Glockner, Ganson, & Portack, 2010; Schleim, Spranger, Erk, & Walter, 2011)? Is it responsible for the process through which many incoming students transform from 1Ls (i.e., first-year law students) who idolize direct public service to 3Ls who accept if not embrace a professional culture idealizing corporate service (Kennedy, 1983)? Does it plant the seeds of the disassociated legal routines that can become the way of life for practitioners, blinding them to injustice (Amsterdam & Bruner, 2000)?

In some measure, it likely contributes to each of these things. The often repeated pedagogical goal of law school is to teach students to "think like a lawyer" (see e.g., Saunders & Levine, 1994). As evidenced by an entire genre of humor, the lawyer joke,

lawyers are not known for thinking in the most socially sympathetic way.[1] But one person's trash is another's treasure. Legal habits of mind, and other forms of professional indoctrination, may have social benefits as well. Thinking like a lawyer involves recognizing when and how to place complex social situations into a network of legal principles, standards, and rules; to understand the implications of the placement; and to take appropriate actions based upon it in situations with very real consequences. To the extent that social categories are irrelevant[2] to the process of legal categorization, learning to use legal categories to frame one's understanding of the world may represent a way to avoid social biases and prejudice in judgments and decision-making.[3]

This is not a new idea. Quite the contrary, the proposition that learning the law can reduce bias is a very old one. Plato and Aristotle each argued that legal training inculcated both the knowledge and spirit of rational, neutral standards into students of the law, enabling them to avoid the biasing influence of their personal experiences on their social judgments (Plato, 1966; Aristotle, 1995). Even so, it is an idea that is remarkably undeveloped in social-psychological research on bias and prejudice, a literature that

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[1] A short selection include: "Why won't sharks attack lawyers? Professional courtesy." "Why did God make snakes just before lawyers? To practice." "What's the difference between a lawyer and a vulture? Lawyers accumulate frequent flyer points." "What do you get when you cross a lawyer with a demon from hell? No changes occur." (http://www.lawyer-jokes.us).

[2] For the purposes of this thesis, I adopt a definition of *social neutrality* akin to the compliment of disparate treatment under Title VII. In short, learned categories are socially neutral to the extent that application of them to two individuals who are identical except for their status vis-a-vis an ostensibly irrelevant social category, e.g., race and ethnicity as opposed to infant or spouse, will result in the same outcome. I set aside broader questions of social neutrality, akin to disparate impact, for another time.

[3] Here I use *bias* as a superordinate term that refers to a tendency to treat, whether cognitively, affectively, or behaviorally, others who possess or to whom are attributed a social characteristic in a way that differs systematically from the way that they would be treated in the absence of such characteristic. *Prejudice* is a subset of bias characterized both by motivation or at least reckless intent and behavior that materially affects others towards whom one is biased. Thus, bias can be benign, whereas prejudice is always malignant. In many interesting cases, which of the available alternative behaviors is accurate, or unbiased, is largely a matter of social construction and justification.

conceptualizes these phenomena primarily through cognitive and motivational processes that determine when people perceive others as members of a social category or as unique individuals.

Here, I generalize from the example of legal education to outline a model of the conditions under which learning to categorize situations, the implications of the categorization, and associated responses can attenuate bias in social judgments by superseding default processes of social categorization in perception, judgment, and decision making: the Competing Category Application Model (CCAM). More specifically, once learned, category frameworks that direct attention towards and define the implications of stimulus cues in ways that are facially unrelated to social groups may be applied to satisfy the fundamental human needs of understanding or deriving meaning from the world and for cognitive economy. As a result, the generalized default of social categories, as well as the stereotypes and attitudes associated with them, may never be activated, or not applied if activated, and thus judgments and decisions are not subject to bias from social categorization.

Under CCAM, the bias-reducing effects of learning situation categories are not uniform for all social categories. Rather, the effects are moderated by indeterminacy in the implications of and responses to activation of a particular situation category. Indeterminate situation categories require additional interpretation before a judgment can be make. This leaves room for co-activated social categories to influence perception, inference, judgment, and behavior.

CCAM emphasizes the role that learned categorization of entire situations, rather than categorization of the individuals in them, might play in influencing judgment and decision-making. As such, CCAM represents a different perspective for understanding and predicting the expected frequency of bias and prejudice than that which (a) is typically advanced in social cognitive research, (b) is used to frame debates surrounding the extent of bias in naturalistic settings, and (c) often forms the basis for efforts to reduce bias in professional and organizational settings. Even so, difficulty transferring learning to new domains, the influence of automatic social categorization, and the near impossibility of crafting generalized, determinate social categories that do not yield inappropriate, arbitrary responses each represent a substantial barrier to the debiasing effects of situation categorization. Thus, as a way of reducing bias, CCAM is not a panacea. Nevertheless, as a combination of social cognition and learning theory, it is a unique alternative to the available social-cognitive models that may help people to identify and understand pockets of social judgment that are bias free or particularly bias prone.

The remainder of the thesis proceeds in four steps. First, I provide an overview of the dominant social-cognitive paradigm for understanding bias as a function of automatic categorization versus effortful individuation of others. Reviewing three models to illustrate, I explain how the paradigm is consistent with the possibility that individuals may use alternative (i.e., non-social) category systems. The social-cognitive perspective on bias, however, regards this possibility as a relatively minor case and thus has not directly addressed or developed the conditions under which it might systematically occur.

Second, I review the long tradition of psychological research and theory on how expertise, habit, or "professional deformation" (Bruner, 1957, p. 51) can guide and constrain perception, judgment, and decision-making within particular domains. In addition, I discuss how difficulty transferring knowledge across domains represents a substantial limitation on this effect. Third, combining the theoretical and methodological insights from these research traditions, I describe the CCAM and its central predictions. Fourth, I report the results of three experimental studies testing the predictions, each of which provides strong support for CCAM. Finally, I conclude by discussing the results of the studies; their limitations; their implications for our understanding of bias, our ability to predict it, and the design of interventions that ought to reduce it, as well as some future directions for research on the model.

Chapter II: Theoretical Foundations

Social categorization versus individuation.

The utility of social categorization. Social-cognitive science generally recognizes that there are substantial limitations on human ability to process information (Fiske & Taylor, 2008). In light of the profound complexity of the world, to compensate, we construct networks of categories for uniquely associated (McConnell, Sherman & Hamilton, 1994; Hilton & von Hippel, 1996) or repeatedly paired (Gluck & Bower, 1988; Olson & Fazio, 2001) stimuli and their characteristics. Subsequent recognition and "placement of an object in a network of hypothetical inference concerning its other observable properties, its effects, and so on" (Bruner, 1957, p. 11) thus supplies us with a functional understanding, or meaning, of the stimulus and provides guidance as to appropriate ways to respond.

Social categories (e.g., race and gender) along with their implications (i.e., the stereotypes and evaluative attitudes paired with them) are understood as an application of the general process of stimulus categorization to people (Allport, 1954/1979; von Hippel, Sekaquaptewa & Vargas, 1995). "[B]y introducing simplicity and order where there is complexity and nearly random variation" (Tajfel, 1981, p. 132), social categorization is thus a satisficing mechanism that provides us with some basis for formulating a response while conserving scarce cognitive, attentional, and behavioral resources (Allport, 1954/1979; Fiske, 1998; Fiske & Taylor, 1991, 2008; Macrae, Milne, & Bodenhausen, 1994). Consistent with this, the results from a voluminous body of research suggests that the activation of social stereotypes is a fast, automatic, influential default (Amodio, 2008;

Devine, 1989; Fazio, Jackson, Dunton & Williams, 1995; Fazio & Olson, 2003; Fiske, 1998; 2004; Fisk, Lin, & Neuberg, 1999; Fisk & Taylor, 1991, 2008; Gawronski, 2009; Greenwald & Benaji, 1995; Nosek & Banaji, 2001; Nosek, Greenwald & Banaji, 2005; Nosek, Greenwald & Banaji, 2007; Schnabel, Asendorpf & Greenwald, 2008).

***Effects of social categorization*.** Much social-psychological and social-cognitive research on bias focuses on discrete social category dyads (e.g., blacks and whites, males and females), although there are innumerable others. Each of the social categories, in turn, is, or can be, associated with a set of prototypical characteristics, or stereotypes, and evaluations, or attitudes. The menagerie of social categories, however, does not necessarily mean that the effects of social categorization cannot be organized. Based upon the accumulation of convergent research from a variety of national and cultural contexts, Cuddy, Fiske, and Glick (2008) propose the Stereotype Content Model and BIAS Map (hereafter collectively SCM). In SCM, the effects of categorization of others across the variety of social groups is mediated by associations of prototypical members of the social categories to which such individuals are identified with specific levels of *warmth* and *competence*.

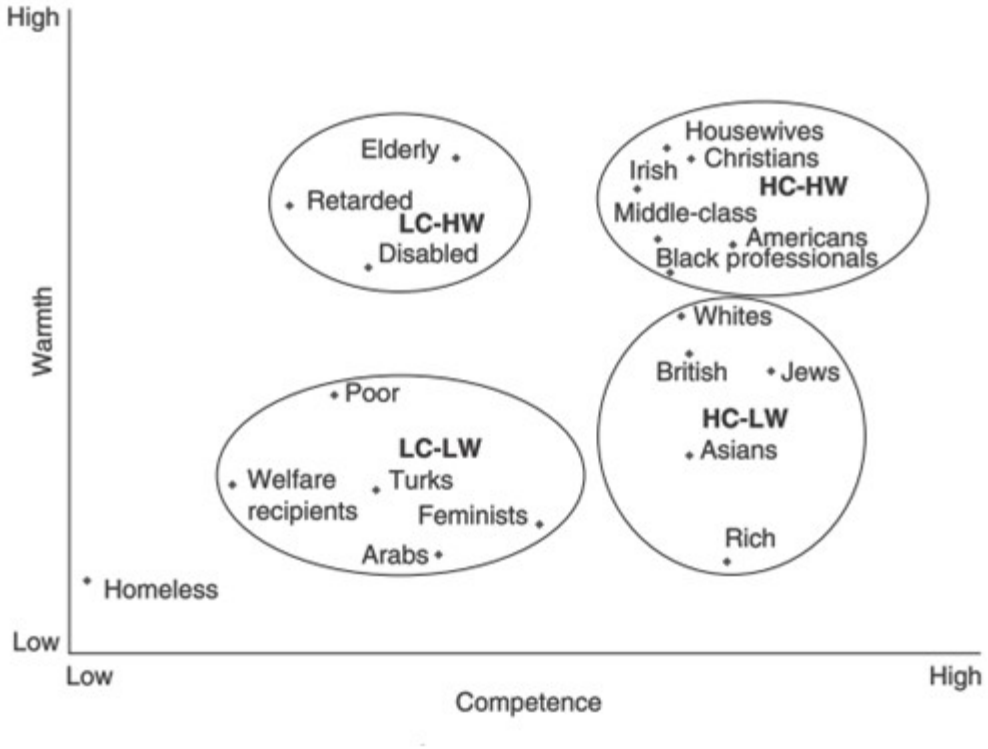
More specifically, the SCM is an integrative theory that posits that social categorization is universally characterized by placement of others on two dimensions. The first, warmth, is primary both temporally, being activated within as short as 100 ms following perception of another, and in terms of the amount of influence on judgment. It represents an assessment of the intent, good or bad, of others towards one's self or one's in-group (for a review see Cuddy, Fiske, & Glick, 2008). The second, competence,

represents a judgment as to the effectiveness of others (i.e., whether they are capable of accomplishing their intents).

Across numerous international samples, researchers have found that perceptions of various social groups is relatively stable within a culture and can be reliably arrayed across the warmth and competence dimensions. Thus, for example, Americans tend to classify the elderly, retarded, and disabled, along with housewives, and Irish, as high-warmth, low-competence; Asians, Jews, feminists, businesswomen and the wealthy as low-warmth, high-competence; the middle-class, students, and Christians (i.e., typical in-groups of participant samples) as high-warmth, high-competence; and welfare recipients, Arabs, and homeless people as low-warmth, low-competence (for an illustration of the clustered ratings from one study see Figure 1). In a sample from Hong Kong, the elderly, mentally ill, and children were regarded as high-warmth, low-competence; professionals and the rich as low-warmth, high-competence; Asians and foreigners (the typical in-group in that culture) as high-warmth, high-competence; and the poor, immigrants, and Pakistani as low-warmth, low-competence (Cuddy, Fiske, & Glick, 2008).

Moreover, patterns of warmth and competence predict discrete emotions and behavioral responses. Thus, members of groups characterized as high-warmth, low-competence tend to elicit feelings of pity or paternalism; low-warmth, high-competence elicit envy; high-warmth, high-competence elicit admiration; and low-warmth, low-competence groups elicit contempt or disgust. Following these emotions, people are more likely to actively help those that they perceived as high in warmth and actively attack those they perceive as low in warmth. Similarly, they are more likely to

Figure 1: American's Perceptions of Warmth and Competence of Select Social Groups



Source: Cuddy et al. (2007).

passively neglect members of groups viewed as low in competence and passively cooperate with those seen as high in competence.

Mechanism of social categorization. People are not doomed to use social categories. Although social categorization provides a cognitively efficient basis for understanding, people often can expend the resources necessary to think deeply about others. Thus, social categorization and associated stereotypes and attitudes affect decisions most "when a perceiver lacks the motivation, time, or cognitive capacity to think deeply (and accurately) about others" (Macrea & Bodenhausen, 2000, p. 105; see also Chaiken, 1980; Chaiken & Trope, 1999; Fiske & Taylor, 2008; Schneider, 2005).

The inability to think sufficiently deeply to overcome bias can occur when the structural demands of doing so exceed the available resources (e.g., judgments that are inherently difficult or ambiguous); when cognitive resources themselves are limited; or both (e.g., when individuals are motivated to draw inferences from or go beyond the available information to understand a situation). Thus, when Dovidio and Gaertner (2000) had participants evaluate mock job applicants, the race of whom had been experimentally varied, they found that the applicants' race did not affect evaluations of either exceptionally qualified or poorly qualified job candidates, that is, when the "correct" response was readily derived from a common understanding of the available information. However, the applicants' race did influence evaluations of marginally qualified candidates, in which case evaluations were biased against black applicants (see also Souchon, Cabagno, Traclet, Dosseville, Livingstone, Jones, & Maio, 2010).

Yzerbyt, Schadron, Leyens, and Rocher (1994) find similar effects when decisions are made when there is some individuating information present, but not enough on which to base a reasoned judgment, a situation in which individuals feel justified in making a judgment, but are unequipped to actually do so. In addition, Gilbert and Hixon (1991) showed that once stereotypes are activated, they are applied more by participants with fewer cognitive resources. Finally, at a neurological level, Amodio, Devine, and Harmon-Jones (2008) found evidence that conflict-monitoring systems play a role in the regulation of intergroup bias, suggesting that individuals with sufficient self-regulatory resources can suppress the application of stereotypes (see also Monteith, Sherman & Devine, 1998).

The relationships among task demands or motives, cognitive resources, social categorization, and ensuing bias are embodied in the core elements of some of the most prominent models of social cognition: The dual-process and dual-system models. Introduced to social psychology in the early 1980s (see Chaiken, 1980; Petty & Caccioppo, 1981), these models have proliferated in social-cognition research. For example, Evans (2008) identifies 15 separate dual-process models, Kruglanski and Orehek (2007) critique 13, and Smith and DeCoster (2000) discuss 8. Indeed, his introduction to Chaiken and Trope's (1999) edited volume on the topic, Gilbert (1999, p. 3) suggests, only half in jest, that the number of dual-process models covered therein suspiciously approximates the number of authors of the various chapters.

The central insight and unifying assumption of these models is that apparently complex attitudinal-behavioral relationships of people in a particular domain can best be explained in terms of two different cognitive processes (Evans, 2008; Kruglanski & Orehek, 2007; Smith & DeCoster, 2000). In addition, the majority of such models include one process that is high capacity, operates quickly, and is automatic; a second process that has a small capacity, is relatively slow, and is deliberate; and a mechanism, e.g., attention and motivation, that explains how the two opposing processes work together (see generally Chaiken & Trope, 1999; see also Kahneman, 2011).

Here I discuss three of them in more detail to illustrate the range and convergence of the models: The Continuum Model (Fiske, Lin & Neuberg, 1999; Fiske & Neuberg, 1990; Fiske, Neuberg, Beattie & Milberg, 1986), Reflexion-Reflection theory (RRT;

Lieberman, Gaunt, Gilbert & Trope, 2002; Lieberman, Schreiber & Ochsner, 2003), and the Heuristic-Systematic Model (HSM; Chaiken, 1980; Chen & Chaiken, 1999).

The Continuum Model. The Continuum Model (Fiske, Lin & Neuberg, 1999; Fiske & Neuberg, 1990; Fiske, Neuberg, Beattie & Milberg, 1986) proposes that person perception proceeds from automatic initial categorization to highly effortful piecemeal integration in iterative steps moderated by category fit and personal relevance. Of those available, social categories associated with readily available cues across a variety of contexts (e.g., race, gender, and age) are thought to have priority for the purposes of initial categorization over more subtle social categories or sub-categories (e.g., lawyer, doctor, electrical engineer) that may not have common, immutable cues. Initial categories function to guide or organize perception, categorization, and inference of other stimulus cues.

Whether the initial categorization is retained or reexamined and possibly refined, changed, or in the case of complete individuation, abandoned entirely is primarily a function of the *personal relevance* of the perceived individual. People are most likely to retain the original categorization of perceived others who have low personal relevance (e.g., fellow pedestrians passed on the street). There is simply no motivation of any kind to revisit the initial categorization and impression. By contrast, others who have high personal relevance (e.g., one's partner or supervisor) are most likely to be individuated.

The extent of personal relevance operates on categorization through *attention* and *interpretation*. If motivated, individuals will direct attention to additional stimulus cues. The cues are then interpreted in accordance with motivational goals to form a more

refined impression. To this end, the Continuum Model recognizes five core social motives: Belonging (the need to be part of and get along with a social group), understanding (the need to have a shared understanding of reality), controlling (the need for power and self-efficacy), self-enhancing (the need for a positive self-impression), and trusting (the need to expect positive responses from in-group members). Thus, mediated by attention and interpretation in accordance with operative motives, the extent of the personal relevance of others corresponds to more refined, but not necessarily more accurate, impressions of them.

Consistent with the idea that categorization guides perception and inference, once additional stimulus cues are found, people try to interpret them in a way that confirms the initial categorization, a process known as *confirmatory categorization*. If the initial category is faulty or poorly fitting, individuals who have sufficient motivation and attentional resources will attempt to re-categorize. This can include sub-categorization, such as woman to business-woman (cf Pendry & Macrae, 1995) or banker to feminist-banker (cf Kahneman, 2002).

When no categories adequately describe the individual in light of the available stimulus cues, and given sufficient motivation and attention, perceivers engage in *piecemeal integration* of the perceived other (Fiske, Lin & Neuberg, 1999). In this process, all of the cues about the perceived other are integrated into a unique impression about him or her. This process does not remove the effects of prior social categorization with respect to the individual. Rather, unknown attributes tend still to be inferred from them.

Finally, irrespective of what level of categorization or individuation concludes the process (or at which they happens to be when a response is required), individuals respond to the individual based upon the inferences that can be derived from them. Thus, under the Continuum Model, impression formation is a dynamic process. The relative influence of stereotypes and attitudes associated with social categories and that of category inconsistent cues, or individuating information, is a function of the motivation, attention, and inferential impressions of the perceiver.

Reflexion-Reflection Theory. RRT is a dual-system model focused on describing the neurological process underlying automatic, or associative, versus conscious, or semantic, thought (Kruglanski & Orehek, 2007; Lieberman et al, 2003; Fiske & Taylor, 2008). To do so, it describes two neurological subsystems: the X-system (named for the "x" in reflexion) and the C-system (named for the "c" in reflection). The X-system is the automatic processing system and relates to what we might think of as the stream of conscious (although we do not usually have conscious access to or awareness of much of what the X-system is doing). Its basic function is to monitor, decode, evaluate, transform and otherwise try to make some sense out of the nearly continuous input our brains receive from the environment and ourselves by "tuning" that input to past experience and current goals (Lieberman et al, 2002, p. 5).

The X-system can be thought of as a network of neurons connected by weighted links that collectively depict perceived stimuli through patterns of activation. It has a few essential characteristics. First, it is sub-symbolic, which means that there is no one-to-one correspondence between objects or things perceived and a specific element (i.e.,

neuron) of the network. There is no one neuron for black or white, male or female, young or old. What we perceive is represented in patterns, and the patterns must be construed in order to have any meaning. Second, the X-system works through "pattern matching" (Lieberman, 2002, p. 7). This is the process through which, over time, the X-system stores common patterns of activation, or covariation in neuron activation, and slowly adjusts the weights of the connections between neurons based upon the reoccurring patterns. Using these prototypical patterns, the X-system affords flexible interpretation of a wide range of stimuli that do not conform exactly to prototypical patterns. This allows one to recognize a variety of people confidently as, for example, females, even in the absence of conclusive evidence to that effect. Third, the X-system is a parallel-processing system that operates bi-directionally. Thus, at a basic level, the system can represent numerous stimuli simultaneously, and neurons that are connected activate each other in both directions. These characteristics make the X-system very fast and cognitively efficient but also make it possible for two types of inferential problems to occur: The competing activation of inconsistent patterns (e.g., female appearance but masculine behaviors) and errors in inference about causality (e.g., secretaries tend to be women so women can only be secretaries).

A simple example illustrates the X-system's associative process and problems with it. Consider the following scenario:

> A boy and his father were in an automobile accident. The father was killed instantly. The boy, alive but badly injured, was rushed to the hospital and prepared for emergency surgery. But the surgeon, on seeing

the boy, said, "I can't operate on that boy. He's my son." (Mook, 1996, p. 394, 411).

How can this be? If you arrived at the solution without noticing that the riddle appears to involve an inconsistency, if not a logical impossibility, you are unusual. Indeed, try it on a few of your friends who have not just been reading about social categorization to see how they do. If you noticed an inconsistency, were momentarily confused, or had some trouble solving the riddle, you are not alone.[4]

In terms of the X-system, the riddle works for two reasons. First, as you read the word "father," the pattern of light and dark that form the text activates neurons associated with the stimulus. These include the prototypical pattern of family in which the parental partner associated with the term "father" (i.e., the mother) is female. Similarly, the text of the word "surgeon" activates a prototypical pattern of associations, including those for "male." In both cases, the text is automatically interpreted by the X-system not only as more than lines or words but as concepts with implications (i.e., meaning) because neurons for what is actually seen are activated *along with* the other associated neurons that are frequently activated at the same time but are *not* representing something that is actually present. What is not observed is thus inferred by automatic parallel activation of associative networks of neurons in the X-system.

The second reason the vignette works as a riddle is because, given the remaining information in the narrative (e.g., the father is dead), there is an inconsistency between the two prototypical patterns that have been activated: (1) The boy's only living parent is

[4] Mook (1996) reports that, in his studies, "[a]n incredibly high proportion of college students, women as well as men, fail to solve [the] riddle" (p. 394, 411).

female and (2) the male surgeon claims to be the boy's parent. The result of the conflict between patterns is psychological arousal and increased attention (e.g., subjective feelings of surprise, confusion, interest, or curiosity). This arousal and attention mark activation of the C-system.

Generally, the X-system can quickly resolve pattern conflicts on its own through a process of parallel constraint satisfaction by favoring the higher weights in the connections. When it cannot, however, the C-system is recruited to address the issue. In contrast to the X-system, the C-system does not attempt to represent or interpret all inputs efficiently as "reality," but only to resolve specific contingencies that cannot be resolved by the X-system as abstract problems. It produces what we might think of as conscious thought – i.e., what it is that we are actively thinking about or attending to at a given moment – or the "consciousness *of* ____" (Lieberman et al, 2002, p. 12) that we are focused on at a given instant in the stream of inputs from the X-system.

According to Lieberman (2002), the C-system has a few main defining characteristics: "*authorship*, *symbolic logic*, *capacity limits*, and that it is *alarm-driven*" (p. 13). First, *authorship* means that the operation of the C-system feels intentional, controlled, and effortful—it is the active self in conscious thought. Second, the C-system operates through the use of symbolic logic, which means that it has the capacity to derive true statements based upon stimuli that are *not* present and gives us the ability to think about and learn from events that we have never experienced. Third, the C-system has a sharply limited capacity; we can really only think about one thing at a time. Finally, the C-system is characterized by being alarm driven. It is called into action when the X-

system is unable to match a pattern in or resolve a competing activation caused by the stream of inputs it is receiving and interpreting. In Lieberman's words (2002, p. 15): "There may be fish in the stream of consciousness, but when an elephant swims by we sit up and take notice."

Thus, under RRT, categorization and individuation are mediated by relatively significant inconsistencies in the prototype patterns activated by the available stimuli. Applied to social categorization, where there is no intractable conflict between the activated prototype pattern and perception, the X-system automatically directs inference, effectively reinforcing the stereotypes. People examine the automatic inferences and their effects only when they have adequate cognitive resources and there is a pattern conflict (e.g., unexpected or counter-stereotypical examples such as the 71-year old Jack Palance doing one-armed pushups at the Oscars, a tough female leader, or an accomplished African-American President).

Heuristic Systematic Model. Although initially focused on persuasion, the HSM has evolved into a general purpose dual-process model for predicting the relative influence of stimuli on attitudes, judgments, and decision-making (Chen & Chaiken, 1999; Eagly & Chaiken, 1993; Fiske & Taylor, 1991, 2008). HSM is similar to other dual-process models (see e.g., the Elaboration Likelihood Model, Petty & Caccioppo, 1984, Petty, Caccioppo, & Goldman, 1981; Smith & DeCoster, 2000), most of which converge with HSM in their predictions under a variety of conditions. Against this background, a distinguishing feature of HSM is that its major elements correspond closely to those of several foundational theoretical frameworks, including those identified

with persuasion (Eagly & Chaiken, 1993; Hovland, Janis, & Kelley, 1953; McGuire, 1968), the functional theory of attitudes (Katz, 1960; Smith, 1947; Smith, Bruner & White, 1956), and perception, categorization, and concept attainment (see e.g., Bruner, 1957).

The HSM describes a continuum of cognitive processing described by its two extremes. On the one hand is *heuristic* processing. It is defined by lower cognitive effort and attention to and use of stimulus cues that can be easily placed into categories with associations to relevant, direct responses. On the other hand is *systematic* processing. It involves relatively effortful and comprehensive processing of cues and categorization or sub-categorization of larger amounts of available judgment-relevant information (Chen & Chaiken, 1999). Mediating use of the two is motivation and the *sufficiency principle*. A principle of adaptive economy, it states that individuals will minimize cognitive effort to the extent they can and still be confident enough in their judgments and decisions to satisfy the *sufficiency threshold* set by their current motives and goal states. Where the sufficiency threshold exceeds a person's confidence level, they engage in more systematic processing (cf Bruner, 1957).

Consistent with broader theory suggesting that the type of motivation affects category activation, the HSM recognizes three main types of motivation (Chen & Chaiken, 1999). First is accuracy motivation, defined by a desire for open-minded and unbiased judgment. Second is defense motivation, the desire to preserve one's (often positive) self-concept. Third is impression motivation, or the desire to convey a particular image of one's self to others.

The HSM also recognizes that the availability, accessibility, and applicability of heuristics moderate whether relevant cues will activate categories and applicable responses in a given situation. More specifically, available heuristics are those associated with categories that have been learned and stored in memory. The accessibility of a category refers to its probability of being activated by relevant cues. Accessibility is affected by situated factors such as the frequency or recency of use as well as individual differences in schematicity or chronic activation. Finally, applicable categories are those that are relevant to the situation and judgment of interest. Thus, stimulus cues that regularly activate relevant existing categories associated with responses that satisfy motives or goal states will likely develop into automatic and influential heuristics.

Finally, the HSM makes specific predictions about the effects of the interactions of cues at heuristic or systematic levels on categorization, judgment, and decision-making depending upon the priority and congruence of the cues. According to the *additivity hypothesis*, when heuristic cues are consistent with semantic cues, judgments are based on both. Similarly, when it is possible for the two to be congruent, as in the case of ambiguous situations with social category cues, under the *bias hypothesis*, earlier activated heuristic categories should affect expectations, and thus attention and encoding, of subsequently encountered systematic cues. Alternatively, when activated heuristic and systematic cues have inconsistent implications, according to the *attenuation hypothesis*, systematic processing may reduce the effects of the heuristic cues on categorization and response.

Debating the extent of bias. The extent to which bias from social categorization affects decisions in, for example, legal or workplace settings, is the subject of much academic and legal debate. Informed and constrained by the automatic-categorization-versus-effortful-individuation theme running through the social-cognitive paradigm, some of the most prominent arguments on both sides of the issue focus on the presence of features thought to motivate accurate, effortful cognitive processing (see e.g., the target and response articles exchange in *Industrial and Organizational Psychology*, 2008, or Tetlock & Mitchell, 2009, and Jost, Rudman, Blair, Carney, Dasgupta, Glaser, and Hardin, 2009).

Representing one side of the debate are researchers who draw on studies showing the ubiquity, persistence, and robust processes of social categorization:

> "…subtle forms of bias are automatic, unconscious, and unintentional... The implication of these subtle forms of bias is that people—observers and actors alike—cannot so easily detect, name, and control them. They escape notice, even the notice of those enacting the bias" (Fiske, 2004).

On the other, researchers argue that laboratory studies of undergraduates cannot be used to predict bias in professional settings, where motives and information differ systematically from that present in an experiment. For example, Tetlock and Mitchell (2009) argue that features of "complex, high-stakes workplaces that have often erected institutional barriers – training and accountability procedures – against unlawful discrimination" should attenuate even automatic biases by inducing accurate, effortful processing (p. 16). The dominant paradigm thus constrains the terms of the debate and

research supporting each side to moderators of the extent to which people use cognitively efficient social categories *versus* cognitively expensive individuating information in impression formation, judgment, and decision-making (Allport, 1954/1979; Fiske, 1991, 2008).

What is missing. The above review is not intended to imply that the only moderators of bias found in social-cognition research fall on the categorization-versus-individuation continuum. Reviews of basic science research exploring the moderators of bias from social categorization (see e.g., Blair, 2002; Olson & Fazio, 2006; Pettigrew & Tropp, 2006) identify several factors that alter the implications of social categorization (i.e., stereotypes and attitudes) or change which of several relevant social categories is activated. These include exposure to members of the category, classical conditioning, priming manipulations, and the presence of others in the situation (e.g., those who are counter-stereotypical or who change which social category is salient). From the applied side, reviews of attempts at diversity training, such as the courses corporations offer in an attempt to teach cultural sensitivity and skills for successful intergroup-relations, suggest that such programs improve knowledge about and attitudes towards diversity in the abstract but do not change attitudes towards particular minority groups (see e.g., Anand & Winters, 2008; Kulik & Roberson, 2008; Paluck & Green, 2009).

Implicit in these studies is the assumption that social categorization is something that must be addressed directly if bias is to be avoided. Social-cognitive research exploring the possibility of avoiding social categorization by learning to categorize entire situations in a way that does not implicate the social categories of individuals in them is

almost non-existent.[5] The few relevant exceptions, however, suggest that, when participants are given instructions that define the situation in a way that directs their attention away from social categories, they tend not to activate or apply such categories (Blair, 2002). For example, Wheeler and Fiske (2005) showed that automatic social categorization does not occur when individuals are given a non-social processing goal. In particular, in two studies, they had participants view photographs of faces of black or white males. In each, they manipulated the cognitive set of participants by giving them a non-social goal of identifying whether there was a dot on the photograph, a social categorization goal of identifying the age of the individual depicted, and an individuation goal by directing them to guess whether the individual depicted in the photograph liked certain vegetables. In the first study, using fMRI, they found amygdala activation consistent with perception of members of out-groups in participants engaged in the social categorization and individuation tasks, but not the dot identification task. In the second, using a lexical decision task, they found evidence of social categorization and stereotype association only in the social judgment task (see also Macrae, Bodenhausen, Milne, Thorn, & Castelli, 1997).

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[5] Extant social-cognitive models generally allow for the possibility of alternative categorization and thus are not inconsistent with it. Typically, however, this possibility is either not directly contemplated or, if contemplated, left as unexplored territory from a social-cognitive perspective. For an example where it is treated directly, if briefly, Lieberman et al (2003) suggests that RRT has specific implications for the effect of experience on cognitive processing and decision-making. He posits that experience will affect how well the X-system is able to match and tune different stimuli within a domain. Stated differently, those with more experience in a given domain should have more developed connection weights between neurons that are involved in pattern representations in that domain and thus parallel constraint satisfaction is more likely. At the same time, Leiberman suggests that, with experience, the C-system should become more sensitive to stimuli that present nuanced or situated conflicts. Accordingly, a relative expert's C-system may be triggered by stimuli that are not viewed as conflicting by a novice. Similarly, HSM includes hypotheses about what happens in the case of stimulus cues with completing or complimentary implications (Chen & Chaiken, 1999).

Similarly, Mendoza, Gollwitzer, and Amodio (2010) hypothesized and found that learning-specific implementation intentions can attenuate race bias measured through the Shooter Task. In this task, participants act as police officers in a simple computer game. The game consists of a series of trials in which participants see a series of pictures of black or white individuals who are holding either a gun or a benign object. The task is, under time pressure, to press a designated key to "shoot" only armed individuals. Differences in response times and error rates for photographs of black versus white targets are interpreted as a measure of a biased association between blacks and crime (Correll, Park, Judd, & Wittenbrink, 2002, 2007). In their experiments, Mendoza et al. (2010) showed that anti-black bias on the Shooter Task was attenuated for participants who learned either a distraction-inhibiting (i.e., if person, then ignore race) or response-facilitating (i.e., if gun, then shoot) implementation intention. Notably, their instructions did not moderate race bias when they were not stated in an "if, then" format.

Consistent with the dominant categorization-versus-individuation paradigm, the results of these types of studies are interpreted as interesting, but likely marginal exceptions to the default process of automatic social categorization (see e.g., Blair, 2002). To the extent that individuals operate without a prior, domain-specific framework for understanding the situation they are in, its implications, and the responses expected of them, this interpretation likely holds. Individuals must have some basis for deriving an appropriate response in order to act deliberately (Bechara, Damasio, Tranel, & Damasio, 1997). In the absence of affirmative alternative categories that can provide meaning to a situation, situations are ambiguous and information impoverished and the race, ethnicity,

age, and gender of those present may be all that an individual has to go on. Although consistent with research reviewed above (see e.g., Dovidio & Gaertner, 2000), this description assumes that all individuals approach social-judgment tasks as do undergraduates participating in social-psychological experiments: As rank novices. In these settings, with little else to go on, unless the individuals know that the task requires only dot or gun identification and no more, that is not all the participants tend to do.

On tasks for which individuals have prior, learned, authoritative categories for understanding the meaning of the situation, however, the dominant assumption and result may not hold. As a case in point, when Correll, Park, Judd, Wittenbrink, Sadler, and Keesee (2007) compared the performance of trained police officers and untrained community members on the Shooter Task (described above), they found a robust anti-black bias in reaction time across samples (i.e., social category activation) but also found that police officers participating in the study exhibited *no* racial bias in decision to shoot (i.e., no social category application) (see also Levinson & Young, 2010; Rachlinski et al, 2009). Thus, even without experimenter instruction, the participants who entered the situation with prior training, and thus a more developed understanding of the task, behaved differently than social cognition theory might predict. The officers' performance, however, is entirely consistent with that predicted by longstanding research on the effects of domain-specific expertise on perception, judgment, and decision-making.

Situation categorization

Perception guided and constrained. Like prejudice, the phenomenon of learning and expertise has interested research psychologists almost from the very beginning of the field. Over 120 years ago, James (1887; 1890) identified such complex behaviors such as professional knowledge and demeanor as habits (i.e., automatic and cognitively efficient behaviors formed through repetition). Since that time, a substantial body of evidence has accumulated for the proposition that domain-specific expertise works by guiding and constraining perception, inference, judgment, and behavior. Not long thereafter, echoing Plato and Aristotle, Dewey (1910/1997), described the phenomenon of expert judgment in terms of the characteristic ability of a good judge to separate the legally relevant features of a situation from the irrelevant ones:

> "To be a good judge is to have a sense of the relative indicative or signifying values of the various features of the perplexing situation; to know what to let go as of no account; what to eliminate as irrelevant; what to retain as conducive to outcome; what to emphasize as a clue to the difficulty.... Possession of this ability to seize what is evidential or significant and to let the rest go is the mark of the expert, the connoisseur, the judge, in any matter" (p. 104; see also 1922; 1938; cf. Dickert et al., 2010).

Generalizing the point based on converging observations as to the effects of accumulated knowledge in a given task domain, Bruner (1957) concluded that:

> "…by virtue of living in a certain kind of professional or social setting, our approach to new experience becomes constrained—we develop, if you will, a professional deformation with respect of ways of coding events. The mathematician tends with time to code more and more events in terms of certain formal codes that are the stock in trade of his profession. The historian has his particular deformations, and so too the psychologist" (p. 226).

The ability of experts to automatically categorize and understand the relevance and irrelevance of particular stimuli in their domain of expertise forms the core of prominent expert decision-making theories such as the Recognition Primed Decision Making model (RPDM) (Hoffman, 2003; Hunt & Joslyn, 2003; Klein, 1997; Klein, 1998; Lipshitz, Klein, Orasanu & Salas, 2001; Zsambok & Klein, 1997). Developed and tested using field observations of experienced professionals in high stress situations (e.g., firefighters and military officers), RPDM states that experts operating under pressure follow one of three strategies: First, they automatically recognize a situation as an example of a familiar prototype, which in turn determines (a) their goals and priorities, (b) what information about the situation is relevant or important to them, (c) their expectations of how the situation will unfold, and (d) the typical responses and which responses are likely to be successful. Second, when the situation cannot automatically be recognized, or when the expectancies from the initial identification are violated, experts will gather more information to diagnose the situation, and then, if possible, re-categorize it and adjust accordingly. This process involves a *serial* (not comparative) examination

of prototypes to see whether they are consistent with the information given; prototypes are tested by constructing stories or mental models of how events should occur if the prototype fits. Finally, only when there is no model that fits, experts engage in the considerably more laborious task of comparing alternatives.[6]

Other major expert decision-making models differ in process and certain specifics, but likewise posit that expertise involves automatic recognition of a particular situation as an example of a type of situation, situation prototype, or category of situation experienced before (see e.g., chunking theory, Chase & Simon, 1973; Simon & Gobet, 1996a, 1996b; Bilalic, McLeod & Gobet, 2008; instance-based theories, Medin & Schaffer, 1978; Logan, 1988; and ACT-R models, Anderson, 1982, 1983; Anderson & Leviere, 1998).

Contemporary research on expertise and perception further elaborate the ways in which learning can guide and constrain perception and judgment. For example, addressing a controversy as to whether experts process more information or process information differently, Haider and Frensch (1996, 1999) reviewed skill acquisition studies suggesting qualitative changes in information processing at higher levels of expertise (see also Shanteau, 1992; cf Bilalic, Kiesel, Pohl, Erb, & Grodd, 2011). Based on this, they proposed, "…people learn, over the course of practice, to separate task-relevant from task-redundant information and to limit their processing to relevant aspects

[6] Note that the steps in the RPDM are consistent with those in the cognitive models reviewed above, and very similar to those of the Continuum Model (Fiske & Neuberg, 1990), except that RPDM starts with automatic categorization of a situation based on domain-specific expert experience, whereas the Continuum Model begins with automatic social categorization of individuals. The fact that both expert theory and social-cognitive theory converge on and provide evidence for general processes of categorization (see e.g., Bruner, 1957), further supports the central assumption of CCAM that situation categorization based upon neutral learned frameworks and social categorization based on cultural experience operate at the same levels of cognitive processing.

of the task" (Haider & Frensch, 1996, p. 306). To test the theory, they conducted a series of studies involving basic letter sequence tasks. The tasks included determinative and redundant information. The results of the studies showed, as hypothesized, that individuals automatically learned to ignore redundant character strings, such that with practice, the length of the redundant character string did not affect processing and participants failed to see errors inserted into the redundant string later in the experiment. Moreover, they found evidence that the learning transferred to characters other than those with which the participants practiced (Haider & Frensch, 1996; see also MacLeod, 1998; MacLeod & Dunbar, 1988; but see Bilalic, Kiesel, Pohl, Erb, & Grodd, 2011).

Specific categories displace general. Just as the social-cognitive literature neglects the role of learned alternatives for categorizing situations in establishing meaning, models of expertise generally omit the possible influence of social categories as sources of systematic judgment error. Even so, there is some suggestive research. For example, judgment and decision-making research into the ability of expertise to attenuate the effects of cognitive process heuristics is well developed (for reviews see e.g., Fischhoff, 2010; Kahneman, 1991; Langevoort, 1998; Mellers, Schwarz, & Cooke, 1998; Tversky & Kahneman,1983). In this tradition, Nisbett and colleagues (for reviews see Nisbett, 2009; Nisbett, Fong, Lehman, & Cheng, 1987) conducted several studies documenting professional deformation in the form of learned "pragmatic inferential rules." In the studies, they found that principles of statistics, the scientific method, and economics that are learned in various graduate programs operate to reduce the effects of heuristic judgment biases on decisions. Thus, while not involving social categories, this

line of research shows that when people learn to identify, categorize, and respond to a situation appropriately—at least from the standpoint of a particular professional tradition—they can apply that knowledge and avoid using more generalized judgmental heuristics.

In addition to research on how experts might avoid using inappropriate judgmental heuristics, a much small number of studies on expertise specifically include experimentally manipulated social category cues as foils. Working with naturalistic expert judgments (e.g., weather forecasters, livestock or grain inspectors, clinical psychologists, stockbrokers, and polygraphers), Weiss and Shanteau (2003) developed a theory of expertise that defined it in terms of the ability to attend to and differentiate among the relevant features of a situation (see also Shantau, Weiss, Thomas & Pounds, 2002). Based on this, they developed the Cochran-Weiss-Shantau index of expertise (CWS). It defines expertise as a ratio of the amount of discrimination between the individual's evaluations of various stimuli being judged to the inconsistency in evaluating the same stimuli.

$$CWS = \frac{Discrimination}{Inconsistency}$$

High CWS values indicate that an individual differentiates meaningfully (or at least consistently) among cases judged.

Supporting the information reduction effect for expertise, among other samples, they applied the CWS to data regarding the cues used by expert and novice human resources professionals and found larger differences between CWS's for relevant and irrelevant cues among experts than among novices. Specifically, Weiss and Shanteau

(2003) reanalyzed unpublished dissertation data from a study in which management students and hiring professionals twice evaluated descriptions of 32 applicants for an actual computer programming position. The descriptions included experimentally varied relevant (e.g., recommendations and job experience) and irrelevant (e.g., age and gender) information. Prior to the evaluations, all participants were reminded about the company's hiring policy regarding use of relevant and (factually and legally) irrelevant information. Weiss and Shantau's (2003) reanalysis shows that novices and experts discriminated equally between applicants based upon on the relevant characteristics (i.e., each group had comparably large CWS's for recommendations and job experience). However, management students, but not experts, also discriminated between candidates based upon the irrelevant attributes.

Ford, Gambino, Lee, Mayo, and Ferguson (2004) conducted a similar study in which participants, professionals with an average of 19 years of experience in the food industry, evaluated mock applications for a job in the industry. The race of the applicants, either black or white, was experimentally varied. participants were instructed to base their evaluations on either their gut feeling or careful deliberation, the results of which would be discussed with a supervisor. The study showed that, although evaluations based on gut feelings were racially biased, participants who use careful deliberation and were accountable to a supervisor manifested no such racial bias. As Weiss and Shantau (2003) conclude in their reanalysis, "it is not easy to ignore something as obvious as age or gender, even if required by the guidelines. Professionals, however, followed strategies to do precisely that" (p. 10).

Disadvantages. Not all of the evidence for the effects of expertise on guiding and constraining meaning is positive. Expertise operates to increase the accessibility of familiar categories of situations and associated responses. In doing so, it can also impede the ability to locate better alternatives. For example, Bilalic, McLeod and Gobet (2008) found that the availability of a common solution to a chess problem prevented expert players from spotting a better, but less common solution, a problem more broadly known as the *einstellung effect*. The effect was attenuated, however, as expertise approached that of grand master. These hyper-experts were able to avoid the einstellung effect because they noticed both solutions within the time that they spent actively considering the board. Notably, expertise did not affect how much time that was, suggesting that participants expended approximately the same amount of cognitive resources on the task across levels of expertise.

Moving to more social games, behavioral economists and game theorists observe that those with economic training tend to make systematically more self-interested/non-cooperative choices in social-dilemma games than those without economics training (Frank, Gilovich, & Regan, 1993; Girotto & Gonzalez, 2001; Haucap & Just, 2003; Mendoza, Gollwitzer, & Amodio, 2010; but see e.g., Frey & Meier, 2003, arguing that this is a self-selection effect). Finally, although Plato and Aristotle tout legal training for its ability to reduce bias, Amsterdam and Bruner (2000/2002) argue that the same habits of perception, categorization, and explanation inculcated in legal scholars tend to cause them to miss problems or defects in the legal system.

As these examples suggest, the proposition I advance—that learning to categorize situations in a way that does not implicate social categories attenuates bias—is true only to the extent the term "bias" refers to effects associated with social categories. Situational categories are also heuristic aids in judgment and, as such, limit the information considered, introducing their own biases and basis for discrimination. Although appropriate situational categories may provide more accurate bases for judgment (cf. Gigerenzer & Brighton, 2008; Gigerenzer & Gaissmaier, 2011), to the extent that the biases they introduce are undesirable, they may be more problematic than those associated with social categories. Indeed, any number of arbitrary decision rules may produce decisions unrelated to race or gender (e.g., whether an application form is submitted on an odd or even day of the month) that are otherwise so disconnected from the goals of the judgment enterprise as to be rejected outright. To the extent that situational categories are veridical in relation to established judgment criteria and also social-category neutral, however, when it comes to bias from the default application of social categories, the domain specific situation categories may have an advantage.

Limits on situation categorization. Expert decision-making research provides evidence that repeated experience perceiving situations through a certain framework of categories and associations can create habits of meaning that guide and constrain perception, inference, judgment, and decision making. In addition, there is evidence that situation categorization also displaces other alternative bases for judgment, be they cognitive judgment heuristics or use of social categories. That this can happen, however, does not provide an indication as to when, or to what extent, it will occur. Two of the

major limitations on the ability of expertise to guide and constrain perception, inference, judgment, and behavior -- domain specificity and implication or response indeterminacy -- provide some indication of the boundary conditions of the debiasing effects of situation categorization.

Transfer. The first limitation, domain specificity, relates not to the situation category itself but to the similarities and differences between the way in which it was learned or acquired and the situation to which it is to be applied. For example, Bilalic, Kiesel, Pohl, Erb, and Grodd (2011) used an fMRI to record neural activity of novice and expert chess players observing arrangements of chess pieces on a board. They found that chess masters have qualitatively different patterns of neural activation than novices, the former of which are consistent with an ability to quickly and holistically encode the entire pattern of chess pieces and determine the implications of them. However, the results were highly domain specific: Chess masters were no different from novices at encoding the arrangement of pieces in another, chess-like game. In short, the effects of expertise on fundamentally altering perception and enabling the categorization of entire situations did not transfer.

The term "transfer" applied to learning or training describes the phenomenon in which knowledge acquired in one situation is applied in others (Singley & Anderson, 1989) or behaviors adapted to one situation are repeated in new and different ones (Detterman, 1993). Early models of education assumed that learning transferred fluidly to other domains. Schools could thus teach a general learning curricula (e.g., Latin and

geometry) under the assumption that these subjects improve a child's ability to perform many other tasks.

One of the earliest experimental psychologists, Thorndike, disagreed with the notion of easy transfer of learning and decided to challenge it empirically. For example, in one study (Thorndike & Woodworth, 1901) he trained participants to estimate the area of rectangles, including providing them with squares of specified area for comparison. After 1,000 to 2,000 practice trials, during which the participants' ability improved, he had them estimate the area of other types of shapes. Error rates on the new task were substantially higher than on the learning task and approximately 90% of the pre-training rates. In addition, his analysis showed that learning to estimate one size of square did not help a participant to estimate the size of the next larger square. Thorndike interpreted both results as strong evidence *against* general transfer and *for* stimulus-response learning.

Continuing the program of experiments over 30 years, Thorndike regularly showed that learning transfer did not occur unless stimulus cues in application conditions were highly similar to those involved in learning:

> The mind is so specialized into a multitude of independent capacities that we alter human nature only in small spots, and any special school training has a much narrower influence upon the mind as a whole that has commonly been supposed (Thorndike, 1906, p. 246; for reviews of the history of transfer research see Detterman, 1993; Singley & Anderson, 1989).

A century later, following hundreds of largely unsuccessful attempts challenge Thorndike's conclusion, many learning theorists accept it as accurate (Detterman, 1993; Singley & Anderson, 1989).

The devil, however, is often in the details. What makes a situation "similar" to another, and thus subject to transfer, is not altogether a straightforward determination. Nisbett and colleagues (Larrick, Morgan, & Nisbett, 1990 (Study 2); Nisbett, 2009), for example, showed that people can recognize new situations as an example of a general category of situations and apply the associated responses to it. In their experiment, they assigned undergraduate students to receive training on a set of basic principles of cost-benefit analysis that used either financially framed or non-financially framed examples, or to receive no training at all. participants were then asked to solve problems that were framed either as financial or non-financial. As predicted, trained students were able to apply the principles to solve *both* types of problems irrespective of whether the principles were learned on financial or non-financial examples, whereas non-trained students applied the principles significantly less. Is this transfer? Stated differently, given other possible similarities, what determines whether financial and non-financial situations both fall within one of Thorndike's "small spots"?

Detterman (1993) identifies three dimensions on which situations have been recognized to differ for the purposes of transfer. First is *near* or *far* transfer. At one extreme, near transfer refers to situations that are identical to that in which the knowledge or behavior was acquired except for a small number of distinct differences (e.g., applying skills learned in drawing a 3-inch line to drawing a 5-inch line). At the other, far transfer

refers to situations that differ from the conditions of learning in every way except for a small number of identifiable common features (e.g., applying memorization techniques acquired while learning a string of numbers to memorization of Ginsberg's poem *Howl*).

The second is *specific* versus *nonspecific or general* transfer. In specific transfer it is the content of knowledge that is applied from one situation to another, as would be the case when applying learning from a memorization task that used lists of state capitols to a geography task. By contrast, nonspecific or general transfer refers to the application of general principles or meta-processes acquired in one task (e.g., how to keep oneself motivated) to another.

The third is the difference between the *surface* and *deep* structures of a situation (also called, for example, lateral and vertical transfer, see e.g., Blume, Ford, Baldwin & Huang, 2010). Surface structures are cosmetic features of a situation (e.g., colors, names, shapes) that may aid in recognition but are not functional (Detterman, 1993). The similarities between the gauges in a car and airplane illustrate surface structures. Deep structures, in turn, may not provide easily identifiable cues, particularly to a novice, but are functional. An example is the feature common to the speedometer in a standard car and that in the space-shuttle: They look very different physically but serve essentially the same functional purpose.

In terms of these dimensions, most transfer research is not concerned with application of specific learning or behavior involving surface structure from one situation to another near situation. Indeed, some might justifiably argue that, at the extreme, this is less transfer than over-learning. Rather, the central questions in transfer research are

whether, when, and how individuals transfer general insights involving deep structures to far situations. As Thorndike suggested, the answer to the question is rarely (Singley & Anderson, 1989), if ever (Detterman, 1993). When far transfer based on deep structure does occur, however, it does so because individuals have encoded relevant situations at a sufficient level of generality so that the same category applies to the new situation. Thus, the probability of transfer often depends upon the extent to which the conditions of learning promote the generic or deep rather than idiosyncratic or superficial encoding of the situation.

In his review, Bruner (1957) identified four features of the training situation thought to facilitate generic encoding: Set, need state, degree of mastery, and diversity of training (Bruner, 1957; for recent meta-analysis and qualitative review of studies testing factors affecting transfer see Blume, Ford, Baldwin & Huang, 2010; Burke & Hutchins, 2007; Merrian & Lehy, 2005).[7] *Set* is the attitude or expectation of the learner at the time of knowledge acquisition for the purpose of the knowledge. For example, students who are instructed to memorize lists of related words are much less likely to transfer knowledge of the common features of the words to others than those who are instructed when studying the lists to assess the commonalities (Bruner, 1957).

Using the term "encoding specificity," in their review, Sternber and Frensch (1993) similarly observed that the extent to which individuals learn information in a way that is encapsulated, and thus coded as irrelevant to other domains, affects transfer. As an

[7] Although the CCAM is primarily concerned with situational variables, it is notable that among the strongest predictors of training transfer found by Blume et al. (2010) were several individual differences, including cognitive ability ($\rho = .37$), conscientiousness ($\rho = .28$), and perceptions of pre-training self-efficacy ($\rho = .22$).

example, they cite an experiment in which Bassok and Holyoak (1989) taught students the same principles either in the context of an algebra class in term of arithmetic-progression problems or a physics class as constant-acceleration problems, then assessed whether the students were able to transfer the principles to the other subject. They found that students who learned the principles in an algebra class were able to transfer them to physics but that the reverse was not true, a result they attribute to asymmetries in the ways in which the subjects are typically taught: Algebra is taught as knowledge with general application, whereas physics is taught as though it is a discrete scientific subject the knowledge of which is applicable only to its own domain-specific problems. Quantitatively, Blume et al's (2010) meta-analysis found that the relationship between learning goal orientation and transfer across 11 studies was small ($\rho = .14$).

Need state refers to individuals' level and focus of motivation at the time of learning. Specifically, Bruner (1957) suggested that low and high motivational states encourage specific encoding, whereas moderate levels of motivation facilitate generic encoding. Thus, when a rat or monkey that is very hungry learns a behavior to obtain food, the instrumental relevance of the information is so great under the circumstances that the animal does not show transfer and may not learn generically at all. Alternatively, research studies involving animals that are moderately motivated have shown transfer between situations.

Neither Blume et al.'s (2010) meta-analysis, Burke and Hutchins's (2007) qualitative review, nor any other I was able to locate provides a test of the suggested curvilinear relationship. Both these reviews, however, found a moderate linear

relationship between motivation and transfer ($\rho = .23$ across 24 studies in the meta-analysis). This is not surprising considering that few if any transfer studies using human subjects involve levels of motivation beyond the inflection point, such as food seeking under conditions of near starvation. Such extreme levels of motivation are also likely beyond those experienced in the range of social decisions of interest here. Thus, even were Bruner correct, the positive linear approximation of the relationship between motivation and learning is probably adequate here.

Degree of mastery relates to the process of acquisition of deep generic encoding. As noted above, when novices encode situations, they do so superficially. This is not particularly surprising when one considers that individuals who are experiencing a new situation have no way of knowing which features of the situation are surface and which are deep structures (i.e., they do not know what makes a situation *that* type of situation). Over time, however, individuals form increasingly higher-order associations between cues or features common to many of the situations of that type and learn to ignore features that are infrequent, redundant, or otherwise non-diagnostic. Framed in this way, the characteristics of expertise (e.g., information reduction and professional deformation), reviewed above, represent the fruits of the laborious acquisition of generic, higher-order categories that include the relevant (i.e., deep structural) features of a situation, and exclude the rest.

Bruner (1957) points out, however, that it is also possible to learn higher-order categories by being shown them rather than forming them organically. To illustrate, he uses the example of the formula for acceleration due to gravity. If faced with a problem

in which one needs to know the speed of an object that has been falling without friction for a given time, one could derive the answer by attempting to recreate the situation or a general rule by dropping a large number of objects. Alternatively, however, one could simply memorize the formula and the general class of cases to which it applies. Thus, under the former method, an example of the organic acquisition of generic categories, degree of mastery is almost synonymous with practice. Under the latter, degree of mastery involves only the effort necessary to learn the higher-order categories directly and the categories of situations to which they apply. Either way, Blume et al.'s (2010) meta-analysis found a moderate relationship between post-training knowledge and transfer ($\rho = .24$) across 34 studies.

The final factor that Bruner (1957; see also Reed, 1993) identifies as facilitating generic encoding is *diversity of training*. It refers to the amount of variation in the surface structure of the cases from which the to-be-transferred knowledge is learned. The more variation in such instances, the greater the likelihood of generic encoding. Bruner suggests that the relationship between variation in training situations and transfer lends subtlety to Lewin's famous admonition that if one wants to understand how something works, he or she should try to change it: Identifying deep structure all but requires variation in surface structure so that one can understand what is stable. More concretely, an instructor trying to teach children the category "dog" would apply this principle by showing them examples of dogs that vary widely in size, shape, and color. Similarly, a geometry teacher explaining the Pythagorean theorem ought to use several different right triangles.

Substantiating the role of diversity of training in transfer, Reed and Bolstad (1991) showed that algebra students were able to solve 65 percent of novel word problems when first given two worked-out example problems, one simple and one complex. By comparison, students given the simple worked-out example and set of procedures to use when solving the word problems were only able to solve 47 percent. Notably, illustrating the power of exemplar cases, students given the procedures for solving word problems alone were able to solve only 7 percent of them, whereas those given only the simple example solved 38 percent of them. Thus, use of examples across the range of likely situations in which the knowledge is to be applied tends to facilitate generic encoding and subsequent transfer.

Ambiguous implications and discretionary responses. The second major limitation on expertise and associated learned situation categories relates to its level of indeterminacy. Some situation categories are associated directly with particular implications and behavioral responses (e.g., approaching a four-way stop intersection). Other situation categories are ambiguous; once activated, their implications and any final behavioral responses associated with them, require interpretation or discretionary, secondary judgments (e.g., a request for charity from a disheveled looking man on the street corner).

When placement of a situation in a category is itself determinative of the appropriate response, there is little room for interpretation and thus the effects of learning the situation category relatively determinative. Social-psychologically, activation of such categories itself thus represents a strong situation in that it limits the effects of individual

differences, and thus bias, on behavior (cf. Meyer, Dalal, & Hermida, 2010; Snyder & Ickes, 1985). By comparison, when the implications associated with placement of a situation in a category requires additional inference, interpretation, or judgment, activation and application of the category will be less influential. Social-psychologically, such situation categories provide some guidance and constraint but nevertheless represent weak or precipitating situations in that they allow for individual differences and thus bias to influence behavior (cf. Meyer, Dalal, & Hermida, 2010; Snyder & Ickes, 1985).

At a general level, Hoyt and Kearns's (1999) meta-analysis of psychometric research on bias in observer ratings illustrates the distinction in terms of *explicit* versus *inferential* coding systems—i.e., "the extent to which raters share meaning systems for the construct of interest" (p. 406). Explicit coding systems are those that use rating categories that are based upon directly observable cues, which cues are directly reflected in the definitions of the categories themselves. An example of an explicit coding system would be one that asked raters to identify the number of times a target person smiles. By contrast, inferential coding systems are those that require significant judgments on the part of the rater. For example, a coding system that asks raters to identify how pleasant a target person is on a seven-point scale.

Quantifying the effects of category indeterminacy, in their meta-analysis they found that studies using explicit coding systems produced ratings with a low proportion variance (i.e., less than five percent) attributable to rater bias, the individual differences between raters (see also Meller, Schwartz & Cooke, 1998). By comparison, studies that used inferential coding systems produced a high proportion of variance (i.e., almost 50

percent) attributable to individual difference between raters. Notably, the studies in their meta-analysis that involved both types of rating systems also yielded low levels of rater bias, again less than five percent, suggesting that the availability of an explicit coding system itself attenuates such rater bias.

Shanteau, Weiss, Thomas, and Pound's (2002) review of studies on expert decision-making for within- and between-rater reliabilities yields similar results. Experts in fields that typically use decision aids and in which professionals agree as to the relevant factors for decisions make decisions that have relatively high correlations with their own and other experts' decisions (e.g., respectively $r = .98$ and .95 for weather forecasters and $r = .90$ and .76 for auditors). By comparison, the decisions of experts in fields in which decisions are typically unaided and in which there are a variety of schools of thought as to the appropriate method or basis for decisions typically have low correlations with their own decisions and the decisions of others in the field (e.g., respectively, $r < .40$ for stockbrokers' own decisions, and .32 for the correlation between their own and other stockbrokers' decisions).

Going back at least to Aristotle (1995), scholars have recognized that social situations are sufficiently complex that there cannot be a category or, in his case, legal rule that fits every possible one in every possible way. Indeed, the reason *social* categorization produces bias is that the general characteristics of a group embodied in stereotypes, even if veridical on average for members of a category, are very often inaccurate when applied to specific individual members of the category. Learned situation categories face the same difficulty (Mellers, Schwartz, & Cooke, 1998). As

with the fidelity bandwidth tradeoff (for a discussion of this issue see Hogan & Roberts, 1996), the more highly tailored a category is to a subset of situations (i.e., the higher the fidelity), the more specific and determined the associated response can be without being arbitrary. Response specificity, in turn, leaves little room for error or bias. Alternatively, the broader the applicability of the category (i.e., the more bandwidth) the more interpretation in response, or response flexibility, is required in order to avoid arbitrary outcomes. This, in turn, increases the probability of error, opening the door for bias. For this reason, frameworks of situation categories must be domain specific in order to effectively guide and constrain perception, inference, judgment, and behavior. Those frameworks that seek to provide a generalized standard or procedure for a wide range of circumstances will likely produce more biased results (see e.g., Souchon, Cabagno, Traclet, Dosseville, Livingstone, Jones, & Maio, 2010).

Conclusion

Extant social-cognitive theories typically comprehend the extent of social bias in perception, judgment, and decision-making as a function of either passive categorization or effortful individuation of the individual actors in a situation. However, the theories are commonly tested on individuals with little to no training in or experience with the underlying tasks. Accumulating evidence from studies of individuals who have domain-specific knowledge or expertise on the relevant task suggests that such individuals may perceive and approach the problem differently because of their training or experience. Established theories in the psychology of expertise and learning theory further buttress the notion that individuals who have learned domain-specific frameworks for

understanding a situation may not need to rely upon the default social categories that social-cognitive theory suggests cause bias. These theories also point to at least two major limitations on the ability of individuals to rely upon learned situation-specific categories as opposed to general social categories: Transfer in application and indeterminacy in implications of the situation categories.

Chapter III describes a new model that draws on and consolidates these various bodies of research to describe the factors that influence when social biases should be expected to influence the perceptions, judgments, and decision-making of individuals with domain-specific training or expertise: The Competing Category Application Model (CCAM).

Chapter III: The Competing Category Application Model

The Model

At its core, CCAM is a conditional social-cognitive model for identifying circumstances when bias and prejudice will be attenuated. To do so, it draws on the research and theory reviewed above on the effects of learning, expertise, and transfer to better elucidate the social-cognitive effects of social-category cues on judgment and decision making under conditions in which *other alternative categories for understanding the situation as a whole are available*. Thus, unlike the major extant social-cognitive models, CCAM focuses on identifying and describing the major features of the social-psychological space of (1) individuals who have learned categories for use in identifying, categorizing, understanding, and responding to social judgment situations (2) when those individuals are in such a situation. In these conditions, cues are present that could, at least in theory, activate either situation categories, social categories, or both.[8]

Under CCAM, the primary factors that determine the extent to which available competing categories, social or situation, will be influential are those that determine the relative strength of each type of category in memory and moderate the interaction between them. Consistent with extant social-cognitive models discussed above, social category strength in the model is a function of the *accessibility* of the social category, predicted by such characteristics as the nature of the prior experiences that led to the development of the category and categorical associations, frequency of prior activation of

[8] CCAM can also fairly be interpreted as a compliment to or extension of models like HSM that is focused on situations involving social-category cues *and* cues for competing situation categories.

them, as well as individual differences. With respect to situation categories, CCAM describes their relative strength primarily in relation to the *depth of encoding* of the categories as predicted by the conditions of training that facilitate transfer, also outlined above.

Next are factors that directly moderate the ability of situation categories to displace social categories. The primary moderator under CCAM is the level of indeterminacy, ambiguity, or interpretation required to effectively apply the implications and responses associated with an activated situation category. The level of indeterminacy of the relevant situation category is expected to have a negative relationship with the ability of an activated situation category to attenuate the effects of social categorization. Thus, the more indeterminate the implications and responses associated with a situation category, the more influence social categories will have on perception, inference, judgment, and behavior.

Given extant theory, there are likely many other indirect moderators that affect the relative strength of social and situation categories indirectly by altering the strength or quality of one of them. For example, with respect to social categories, any of the situated moderators of social category activation and application identified above could strengthen, weaken, or alter the quality of the effects of social categorization. Thus, under CCAM, factors like motive, salience, and cognitive load likely moderates the extent of the activation and application of social categories. The change, in turn, would indirectly affect the relative strength of social categories versus any available competing situation categories. Similarly, for situation categories, likely moderators include

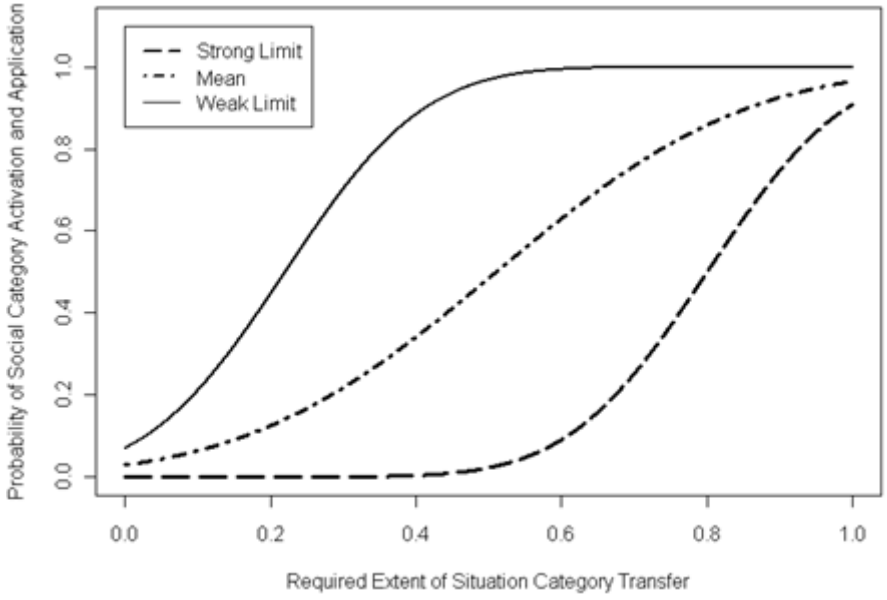
characteristics of the situation that facilitate activation and application of the appropriate prior learning, including external reminders that the situation category applies (see, e.g., situational factors identified by Blume, Ford, Baldwin & Huang, 2010; Burke & Hutchins, 2007; and Merrian & Lehy, 2005).

That is not to say that the factors known to increase use of social categories are expected to always have an inverse effect on (i.e., reduce) situation categorization. Taking cognitive load as an example, while research results show that increasing cognitive load typically increases social categorization (Gilbert and Hixon, 1991), the research reviewed above also shows that, with sufficient experience, situation categories themselves can become highly automated. Generalizing to any habit, there is general support for the existence of a common and influential process connecting constructs across levels of cognitive processing. Aarts and Dijksterhuis (2000), for example, hypothesized and found support for habit as an automatic goal-action link. They showed that modes of travel (e.g., bicycle use) were automatically activated by the goal of travel for those for whom the mode was habitual in a way that required conscious planning for those for whom the mode was not habitual. At a theoretical level, Verplanken (2006) argues that the net result of research over the last 30 years is that habit is not mere behavioral frequency but describes all mental constructs that have the characteristics of being automatic and efficient (i.e., James's habit characteristics). Similarly, Bargh and Ferguson (2000) argue that accumulated research on the common conditional automaticity of higher mental processes (e.g., social perception, evaluations, judgments, goals, and motivation) provides support for a meta-theoretical determinist account of

behavior. And, drawing on associative network models of cognition, Wood and Neal (2007) propose a model of habit as associative structures that are automatically activated by cues. Thus, there is reason to believe that the categorization processes that create meaning at any level can be habitualized (i.e., automated and cognitively efficient). In short, at higher levels of experience, there is good reason to believe that situation categories may very well displace social categories, even under cognitive constraint. Exploration and theoretical development concerning the effects of cognitive load and other indirect moderators on the interaction of competing social and situational categories, however, will be the subject of future research (see General Discussion).

In the aggregate, under CCAM, combinations of the moderating factors are expected to produce a range of possible outcomes. Figure 1 illustrates the range of alternatives in the model-space as the area between two hypothetical functions corresponding to a weak limit, under which social categorization is dominant, a strong limit, under which situation categorization is dominant, and the mean, under which there is relative parity in the influence of the two competing types of categories. Each describes a curve depicting the probability of activation and application of social categories in a given social judgment as a function of the extent to which the individual making the judgment would have to transfer his or her learning of a relevant situational category in order to apply it to that situation.

Figure 2: Expected Probability of Activation and Application of Social Categories Under CCAM



The curve depicting the weak limit, which rises rapidly as a judgment situation differs even slightly from the stimuli and conditions used in learning, suggests that social categorization operates much like over-learned rote associations (i.e., highly robust to alternatives and subject to substantial negative transfer; see Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977). By contrast, the strong limit curve rises slowly at low levels of transfer, the probability of social category activation and application increasing rapidly only when transfer is substantial (i.e., the circumstances and stimuli vary considerably from those involved in learning the situation categories). It approaches the weak limit function in situations in which there is no relevant situation category to apply (i.e., the available situation categories provide no guidance, or meaning, even if they were to be activated). As such, the latter function suggests that social categorization is a bare default

used to guide perception, inference, and response primarily when no other available categorization system applies. The mean curve divides the space between them.

More formally, one can depict the model space for any situation *i* as providing estimates of the probability of social bias ($p(B)_i$) in the situation as a function of the base-line *depth* at which the situation categories are encoded, d_i, the base-line *accessibility* of the social categories, a_i, and the *moderator* of the relationship between them, m_i, i.e., the implication/response indeterminacy of the situation category, where Φ is the cumulative distribution function for the normal distribution.

[1]

$$p(B)_i = \Phi\left(\frac{d_i - a_i}{m_i}\right)$$

In these terms, the weak limit and strong limit curves in Figure 1 illustrate the respective extremes of the CCAM as to the general difficulty of successfully transferring the relevant learned knowledge as predicted by the depth of encoding (d_i), the general ease with which default social categories are activated and applied, i.e., their accessibility, (a_i), and the indeterminacy of the implications and responses associated with the situation category (m_i).

For a more concrete example, picture two white American men. The first is a lawyer with 40 years of experience representing individuals who have been in car accidents and is the author of the primary treatise on automobile accident law. Second is an 18-year old college freshman who has never been in an accident but had seen some depicted on TV. CCAM predicts that the lawyer will have deeply encoded, situation categories for car accident cases. By comparison, any situation categories the student has

applicable to car accidents would be highly superficial and likely associated with only generalized implications and responses. Assume each is asked to evaluate the liability of each of the two individuals involved in an accident: A young, African-American man in a black Cadillac sedan that has tinted windows and is blaring rap music and a 40-year old mother of two driving a light-blue minivan. Controlling for social category accessibility and moderators, the lawyer's response should be far less affected by the social categories of those involved than the student's.

Turning to the extent of transfer, assume that the lawyer and student each are in a minor accident with either the young, African-American man or the 40-year old mother of two. CCAM still predicts that the social category of that individual will have less of an influence on the lawyer's response than that of the freshman, controlling for moderators; however, because of the extent of transfer between evaluating accidents and being in one, there would be less difference between the effects of social categorization on their respective perceptions, inferences, and responses.

Finally, the extent of indeterminacy of the implications of the situation category into which the accident falls will be positively related to the extent to which the social categories influence the lawyer's and student's respective judgments. More particularly, assume that the lawyer rear-ends either the Cadillac or minivan and that he knows from his experiences categorizing accidents of this kind that the legal implications of this fact are that he is liable as a matter of law – a highly determinate implication. CCAM thus predicts that the social category of the other driver will play only a small role in his response. In contrast, if the accident occurs in such a way that it falls into a legal

category where the relative fault, or negligence, of the drivers must be determined by a jury, then the social category of the other driver may play a large role in how the lawyer responds.

Estimating base-line parameters

The specific shape and area of the CCAM space is primarily dependent on estimates of the base-line parameters d_i, a_i, and m_i. In this section, I review social-cognitive literature that provides a basis for deriving an estimate of a_i based upon how robust social categorization has been found to be to experimentally-induced alternative associations. In contrast to social categories, which at least to some degree reflect common cultural experience, the antecedent factors associated with the depth of encoding, d_i, and situation category indeterminacy as a primary moderator, m_i, are highly domain specific. Accordingly, here I lay a foundation for estimating them experimentally in the studies reported below.

Strength of social categorization: a_i. As discussed above, there is a substantial body of research indicating that social categories are automatically activated and applied under a variety of circumstances. The fact of automaticity, however, does not necessarily indicate the amount of reinforcement that created the associations or their strength (MacLeod, 1991; Navon, 1977). Of central interest here is the relative ease (strong form) or difficulty (weak form) with which social categories might be displaced by other alternatives. Theoretically, this is a function of the origin, depth, and over-learning or reinforcement of the association between stimulus cues and social categories themselves, each of which present an empirical question.

The primary theories about the nature of automatic social categorization (i.e., implicit stereotypes and attitudes) state that they are stable constructs formed through long-term processes, such as the acquisition and storage of base-rate information in long-term memory, neural associations between social objects and a valence, or social norms (see e.g., Olson & Fazio, 2002; Rudman, 2004a; 2004b). The support for these theories, however, is indirect, coming largely from observed correlations and analogical comparison. For example, Correll and colleagues (Correll et al., 2002, Study 3; Correll, et al., 2007a; but see Correll, et al., 2007b) found that knowledge, not endorsement, of social stereotypic associations between blacks and crime predicted bias on the Shooter Task.

For individuals low in first-hand experience with members of such categories, such knowledge structures likely are the primary source of the meaning of the individuals in a situation.

> "Thus, where the dependence upon physical reality is low the dependence upon social reality is correspondingly high. An opinion, a belief, and attitude is 'correct,' 'valid,' and 'proper' the extent that it is anchored in a group of people with similar beliefs, opinions, and attitudes." (Festinger, 1950, p. 272-273; see also Berger & Luckmann, 1966; Nordholm, 1975).

Where there is first-hand experience, however, intergroup contact research suggests that the quality of that experience will influence the nature and perhaps depth of social categorization and stereotypes, with negative interactions increasing negative stereotypic associations (see Pettigrew, 1998; Pettigrew & Tropp, 2006; Plant, 2004; Plant &

Devine, 2003; Tropp, 2003). Moreover, there is reason to believe that such internalized, experience-based categories are more robust than knowledge of social norms (see e.g., Learner & Tetlock, 1999) although certainly not impervious to them (Asch, 1955; see also Cialdini & Trost, 1998).

In addition, it is intuitively attractive and parsimonious to connect implicit and explicit stereotypes and attitudes with the automatic and controlled elements of cognitive processing described in studies such as those conducted by Bruner (1957) or Schneider and Shiffrin (1977; Shiffrin & Schneider, 1977) and embodied in social cognitive models like those discussed above. Indeed, common measures of implicit stereotypes and attitudes generally rely upon facilitating or competing category activation paradigms of a kind that are entirely consistent with the methods of learned categorization, transfer, and negative transfer studies (see e.g., Devine, 1989; Fazio, Jackson, Dunton & Williams, 1995; Fazio & Olson, 2003; Gawronski, 2009; MacLeod, 1991; Nosek & Banaji, 2001; Nosek, Greenwald & Banaji, 2005; Nosek, Greenwald & Banaji, 2007; Schnabel, Asendorpf & Greenwald, 2008).

Schneider and Shiffrin (1977; Shiffrin & Schneider, 1977) developed one of the first models distinguishing between automatic and controlled processing. In a sequence of experiments they showed that stimuli subject to over-learned categorical associations (e.g., 600 to 2,400 trials) can reach a state in which, if recognized, categorization is automatic. Further, if attention and response associations with the categories are similarly over-learned, cognitive resources associated with "active control or attention by the subject" (p. 2) are no longer necessary for a response. For such stimuli, attempts to

alter the over-learned categorization of response are subject to substantial negative transfer (i.e., the response accuracy of participants falls far below that of novices and, in their studies, often did not recover to the threshold error rate for upwards of 1,000 or more trials). In short, to the extent attention to, categorical encoding of, or responses to stimuli became habit, it was difficult if not impossible for individuals to avoid doing so.

From a social-cognitive perspective, the robust findings of automatic categorical associations between, for example, blacks and weapons or men and science (Nosek, Smyth, Hansen, Devos, Lindner, Ranganath, Smith, et al, 2007), are arguably conceptual replications of Schneider and Shiffrin's (1977; Shiffrin & Schneider, 1977) findings. participants in many of these implicit-attitude studies are thought to have over-learned social-categorical associations and thus automatically make the associations in the presence of members of those categories, and experience negative transfer when attempting to change or avoid them. However, in the case of social categories, the original over-learning is inferred, being attributed to general social experience (Olson & Fazio, 2001, 2002).

Articulating the theoretical basis for, and thus factors that might affect, the base-line accessibility or degree of the strength of automatic social categorization does not provide an estimate of its strength. By accepting the presumption of a connection between the acquisition of automatic associations between arbitrary character-string categories in laboratory studies and the naturalistic accumulation of associations with common social categories, the extent of over-learning of social categories and thus their relative resistance to non-automatic activation could be estimated from the extent of

training it takes to reverse them (cf. MacLeod, 1991; Stroop, 1935). The results of studies that attempt to eliminate the automatic activation of social stereotypes and attitudes through training can be used to do just this.

Kawakami, Dovidio, Moll, Hermsen, and Russin (2000, Studies 1 & 2) had participants complete a stereotype Stroop Task in which they were exposed to a skinhead or elderly prime and then asked to read the color of the text used to display stereotype consistent or inconsistent words. On this measure, stereotype activation is assessed as a function of the speed of response, with slower responses indicating activation. participants then viewed 480 trials in which they negated either skinhead or elderly stereotypes by hitting a "NO" button when the category and its stereotypic association was displayed and "YES" button when the category and a non-stereotypic word was displayed. Finally, participants completed the Stroop Task again. As hypothesized, although the pre-training Stroop Task indicated stereotype activation in response to the skinhead prime, following 480 trials of negation training, response times for stereotypic and non-stereotypic words were not significantly different. Moreover, response latencies from the training task itself suggest that most of the effect of the training occurred during the first 400 trials.

Kawakami et al (2000, Study 3) replicated these findings with stereotypes of blacks and whites. Training in the study involved 384 pairings of photographs of blacks or whites with stereotypic or non-stereotypic words. Again, participants affirmed the associations that were non-stereotypic and negated those that were stereotypic. As before, for those participants who completed the training, automatic stereotype activation

occurred on the pre- but not post-training measure. Training response latencies indicated that most of the effect of the training was due to the first 288 pairings.

Hypothesizing that the effect in Kawakami et al.'s (2000) study was due to affirmation rather than negation, Gawronski, Deutsch, Mbirkou, Seibt, and Strack (2007, Study 1) replicated the study conceptually but trained participants either to negate stereotype-category matches or to affirm stereotype-category mismatches but not respond to the alternate pattern. More particularly, using stereotypes of men as strong and women as weak, participants saw 50 trials in which each category, represented by male or female names, was paired with either a strength- or weakness-related word, for a total of 200 trials. Following training, participants completed a sequential priming task as a dependent measure. As predicted, the researchers found that only the contra-stereotype affirmation training reduced stereotype activation. In a follow-up study (Study 2) involving attitudes towards blacks and whites, the researchers found the same pattern of results following similar training (also 200 trials) on responses in a subliminal affective priming task.

Finally, Olson and Fazio (2006) used an implicit evaluative conditioning procedure to change attitudes towards black and whites. In the procedure, participants complete a task in which they are shown a series of pictures, interspersed throughout which were CS-US pairs of images of blacks paired with positive words and images and whites paired with negative words or images 24 times each across 6 blocks (i.e., a total of 48 pairings). Despite being unable to accurately report the nature of the associations (Studies 1 and 2), participants completing the procedure showed significantly less

response bias on an implicit attitude measure than those in the control condition (Study 2), an effect that persisted for at least two-days following training (Study 3).

In each study described above, baseline or control group responses to their respective implicit attitude or stereotype measures showed a response bias consistent with automatic social categorization. Each training method was also able to eliminate the effects; doing so required 48 (implicit pairings) to 480 (explicit negation/affirmation pairings) trials. Normed against the approximately 1,000 trials required for Schneider and Shiffrin's (1977; Shiffrin & Schneider, 1977) participants to overcome negative transfer and return to a baseline error rate after having over-learned categorical associations for arbitrary stimulus, the results of the studies reviewed above suggest that the amount of over-learning of social categorical associations is rather modest. This estimate is, of course, to be interpreted cautiously, given that the participants in each of the studies were university students, a population that may have had little personal experience with members of the categories used. Even so, the combined findings of the studies do provide an estimate of the expected baseline of a_i (i.e., the strength or accessibility of social categories controlling for moderators of them) which suggests social categorization may be a pervasive, but not especially robust phenomenon.

Estimating depth of encoding, d_i, and moderating effects of indeterminacy, m_i. Whereas social categories are highly general, reflect broad culturally shared understandings, and are activated by cues that are often obvious, situation categories and their implications tend to be rather specific, require situated training or experience, and, as the extent of transfer increases, stimulus cues associated with them opaque. Thus,

whereas a_i is thought to be relatively stable given its basis in common cultural experience, d_i and m_i ought to vary considerably based on the quality and amount of individuals' training and experience with the situation categories and nature of those categories. As such, an abstracted baseline estimate of the strength of situation categorization under CCAM and the moderating effects of indeterminacy may not be meaningful. Therefore, to estimate d_i experimentally in a way that is useful, I propose norming d_i to the depth of encoding achievable through a short training program on selected categories of situations, which program is designed to maximize the depth of encoding and thus the extent of transfer.[9] The estimated effects of m_i, relative strength of a_i, and the shape of the CCAM model-space will thus be referenced to this norm.

Specific situation categories. Although CCAM is hypothesized to apply to any number of domains with developed frameworks of accepted situation categories, estimating d_i and m_i experimentally requires selecting a domain with situation categories that satisfy the basic theoretical and methodological considerations of CCAM. Thus, to provide meaningful examples and thus provide a meaningful test, the framework of situation categories should have four central features. The categories in the framework should (1) be useful in guiding non-trivial social judgments, (2) be readily learned, (3) operate at surface and deep structural levels so that they can (at least theoretically) be applied to broad categories of situations, and (4) have a range of determinate or

[9] The proposed level of depth of encoding should understate d_i for those with substantial experience and overstate it for those with poorer training and experience. Even so, the depth of encoding that can be obtained in a relatively short training program that satisfies the methodological considerations for an experimental manipulation (i.e., more training may not be practical) as well as applied considerations (e.g., a business estimating how much gain can be achieved in the time typically allotted to diversity training sessions).

indeterminate response associations. The topics explored in the research findings reviewed above include a variety of contexts involving social and socially neutral categories in which the CCAM could be tested (e.g., evaluation of job candidates). Of these, following the classic hypothesis that the study of law can reduce bias, I operationalize the neutral situation categories contemplated by the CCAM using three related types of torts: Ultra-hazardous activities, negligence, and no affirmative duty.

Torts make up the area of civil law that governs liability for harm to individuals based upon social policy considerations (Vandall, Wertheimer, & Rahdert, 2003). As such, it differs from contract law, in which liability is based upon obligations that individuals create for themselves through the contractual process, and criminal law, in which the state acts directly as a party to enforce particular types of statutory prohibitions. Examples of tort cases include lawsuits for financial, physical, and emotional harm (actual or alleged) resulting from car accidents, chemical spills, defective products, medical malpractice, trespass, and all manner of human contact. In short, tort law attempts to regulate the harms that result from the messy hodge-podge of interactions people engage in as a part of everyday life.

The framework of categories of tort rules in general, and the three employed here in particular, have the features identified above as necessary to support testing CCAM. First, they are intended to be and are regularly applied to guide and resolve non-trivial judgments covering a wide variety of social interactions and the ensuing conflicts over liability. Second, they are regularly taught to law students in the form of both general rules and through specific case examples. Third, the range of cases to which courts have

applied a given category provides a natural vehicle for varying the surface structure of experimental stimuli, and thus testing the effects of increased distance of transfer to the application of the rules.

Finally, categories of tort cases differ in response determinacy, or ease of application, once a situation has been identified with them. At one end of the spectrum are those torts, the identification of a case as an example of which itself often resolves a dispute "as a matter of law." The classification of a situation as having involved an *ultra-hazardous activity*, for example, results in a liability judgment against the defendant, whereas classification of a case as one in which the defendant had *no affirmative duty to act* results in a judgment that the defendant is not liable. At the other end of the spectrum are tort categories that indicate what factors are relevant for making a decision, and thus guide decision-making, but otherwise leave substantial room for interpretation in applying those factors to the facts of a case. An example is classification of a case as one involving a question of *negligence*. In negligence cases, whether defendants are liable involves a secondary "factual" determination as to whether they acted with reasonable care (i.e., a balancing test among the harms, costs of avoiding the harms, and benefits of the underlying actions). Variation in indeterminacy of the categories allows for some generalization of the results concerning the ability of learned neutral categories to provide meaning for more and less determinative rules.

Analogical encoding. Computing the estimates also requires a training method that meets the theoretical and methodological requirements of CCAM. One particularly promising technique for meeting the conditions necessary to facilitate

transfer in a relatively short training session is analogical encoding (Gentner, Lowenstein & Thompson, 2003, 2004; Gick & Holyoak, 1983; Kurtz, Miao, & Gentner, 2001). The starting point for the method is case-based learning. Cases are often used in learning, particularly in professional schools, because they offer ready-made category prototypes that students can draw on in subsequent problem solving. Indeed, when used by students or professionals in this way, cases can provide substantial guidance in decision-making (for reviews see Gentner, Lowenstein & Thompson, 2003; Kurtz, Miao, & Gentner, 2001). Unfortunately, for many of the reasons identified above, including the overwhelming tendency to code situations specifically, case-based learning is ineffective, resulting only in inert knowledge (for review Gentner, Lowenstein & Thompson, 2003). Too often, learned cases are simply not recalled when they would be applicable.[10]

Analogical encoding attempts to address the inert knowledge problem and to facilitate transfer by presenting cases to learners in a way that emphasizes latent similarities in structure between them, thus encouraging generic encoding. For example, Gentner and colleagues (2003) tested the effectiveness of this technique in two experiments in which they trained undergraduates to apply abstract principles for obtaining mutually beneficial outcomes in contract negotiations in face-to-face negotiations involving either three issues (pilot study) or one issue (Study 3). There were

[10] The phenomenon of having learned the relevant information (e.g., example case studies in business, law, or medicine) but not in such a way that it will be recalled when needed is known as the inert knowledge problem and is well documented (for review see Gentner, Loewenstein & Thompson, 2003). With respect to legal education specifically, there is a substantial body of literature on the efficacy of law school and the case method, a relatively small amount of which directly incorporates learning theory and theories of transfer or expertise (see e.g., Kowalski, 2010; Mitchell, 1989; Moskovitz, 1992; Mudd, 1986).

effectively four conditions.[11] In the first (No Training), participants negotiated with no training on either principle. In the second (Spontaneous Comparison), participants first studied a negotiation-training packet with two narrative case examples, each describing a negotiation that was resolved using the same one of the principles. In the packet, each case was presented on its own page with instructions to describe the solution to the negotiation. Moreover, both training cases were designed to have different surface structure than the face-to-face negotiation problem. In the third condition (Directed Comparison), the case examples in the training packets were presented on the same page along with instructions to compare the cases and describe the solution. Finally, the fourth condition (Guided Analogy) involved a guided-analogy paradigm in which the process of comparison was explicitly directed, including a diagram of the deep structural similarities between the cases.

As hypothesized, participants in the No Training condition applied the negotiation principles least, in only 5 to 10 percent of 3-issue negotiations and 37 percent of 1-issue negotiations. In the separate case condition, participants did no better than the control in the 3-issue negotiation but somewhat better in the 1-issue negotiation, applying the relevant principle 55 percent of the time. In the self-guided analogical encoding condition, the learned principle was applied in 15 percent of 3-issue negotiations and 70 percent of 1-issue negotiations. Finally, in the guided analogical encoding training condition, participants applied the relevant principle in 25 percent and 90 percent of 3-issue and 1-issue cases respectively.

[11] The pilot study used a pre-/post-training design, with three levels of training, whereas Study 3 used four separate conditions, the three levels of training and a no training condition. Results reported below for the No-Training condition reflect the pre-training results in the pilot study.

The pattern of results is instructive for at least two reasons. First, the results support the relative effectiveness of analogical encoding for achieving transfer, particularly when learners are guided through the process. Second, the difference between the results in the 3-issue and 1-issue negotiation illustrates the difficulty in obtaining transfer when variation in task complexity demands a deeper level of encoding than was incorporated into learning materials. Thus, the participants in the negotiation experiments must have expected that their training would be relevant to the face-to-face negotiation. Despite this, when the task was more complex than the examples given, even among those with the best training, in 75 percent of cases the participants were unable to accomplish transfer. Expectations and set notwithstanding, it is difficult to apply general insights involving deep structures to far situations.

Conclusion

CCAM is an effort to identify and formalize the primary factors that social-cognitive, expertise, and learning theory suggest will be most influential in determining the extent to which social bias can be expected to influence the perceptions, judgments, and decisions of individuals with domain-specific training or experience. Chapter IV describes the results of a set of three experimental studies designed to test CCAM's basic predictions.

Chapter IV: Experimental Tests

Basic predictions

The foregoing review supports the basic proposition and elements of CCAM: Individuals who have learned relevant situation categories can and will use them, rather than default social categories, in perception, inference, judgment, and behavior. The extent to which they do so at any level of transfer is expected to depend upon the relative strength or salience of the social and situation categories and to be moderated by the level of indeterminacy of the inferences and responses associated with the relevant situation categories. Even so, there are very few studies that merge the social-cognitive and learning and expertise literatures in an effort to understand the relative influence of each type of categorization by, for example, designing and testing decisions tasks that contain cues for default social categorization *as well as* those for learned situation categories. Moreover, there are no experimental studies that I am aware of that do so using situation categories that are useful for social judgment compared across the range of the extent of transfer or at different levels of situation category indeterminacy. A direct test is needed.

Legal categorization versus social categorization

Legal categories. The experimental studies described here involved training participants to categorize example legal case vignettes into one of the three legal categories discussed above (i.e., ultra-hazardous activities, no affirmative duty to act, and negligence) and to apply the inferences from the category to assess the liability of defendants in the cases. The training follows the analogical encoding paradigm outlined above. Each case example is based on the facts of an actual case decided by a court of

appeals on the basis of one of the three legal categories. Moreover, half of the cases in each category were decided in favor of defendants (i.e., no legal liability) and half in favor of plaintiffs (i.e., legal liability). The appellate court decision thus serves as an indication of the correct legal categorization and result for each case. The extent to which participants activate and apply the situation categories they learned can be assessed by the extent to which they agree with the appellate court's liability conclusion in each case.

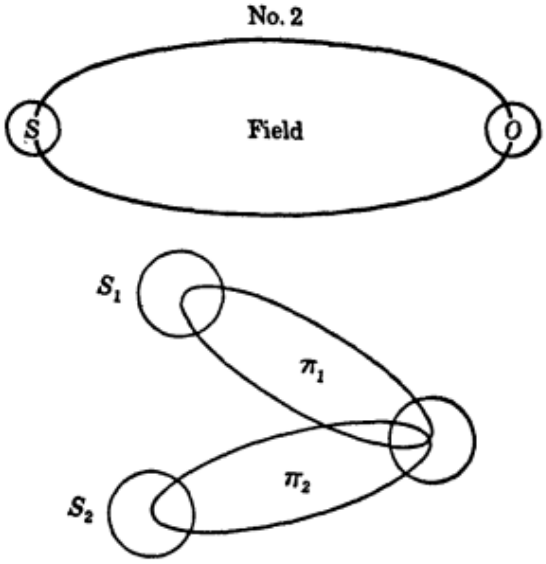
Social categorization. Recall that, under the SCM (Cuddy, Fiske, & Glick, 2008), within a given culture, social categories are commonly associated with certain levels of warmth and competence thought to be true of the stereotypical exemplars of that category. Moreover, to the extent we perceive someone as relatively warm on this basis, we will tend to help that person. The opposite is true of individuals whom we identify as members of social categories that are stereotypically regarded as relatively cold. It thus follows that to the extent that individuals rely upon social categorization in deciding legal cases, they will tend to decide a case for the litigant (i.e., the plaintiff or defendant) that belongs to the social category highest in warmth.

Drawing on this logic, in the case examples used in the studies reported below, the identities of the litigants were altered to produce mean Relative Party Warmth (RPW) ratings (the average difference between warmth ratings of the plaintiffs and the defendants for a case) that were either positive (pro-plaintiff) or negative (pro-defendant). The extent to which participants activate and apply the social categories in making their decisions can thus be estimated by the extent to which their liability decisions are

positively related to the Base-Line RPW (RPW_{BL}) ratings – i.e., the RPW ratings for the case examples made by an independent sample of untrained participants – irrespective of the correct legal outcome.

Borrowing a graphical depiction of interactive social-psychological space from *Field Theory* (Murphy, 1947, p. 883), Figure 2 below illustrates the expected difference between untrained and trained individuals' perceptions of the case examples in classic social psychological terms. In Murphy's (1947) graphic, an "**S**" circle depicts a *situation*, an "**O**" circle an *organism*, and the connecting "**Field**" oval the interaction between them. The core insight of the depiction is that it is the *Field*, not the organism (i.e., individual) that is manifested in observable behavior (Ajzen, 1987; Kendrick and Funder, 1988; Snyder and Ickes, 1985), although this behavior is frequently mistaken for "the" character or personality, "**π**", of an individual (see e.g., Jones & Nisbett, 1972; Pronin, Gilovich & Ross, 2004; see also Malle, 2006; Malle, Knobe & Nelson, 2007). As indicated in the lower image, however, the same individual is expected to manifest different characteristics when in different situations, $\mathbf{S_1}$ to $\mathbf{S_n}$.

Figure 3: Murphy's Diagram of Social-Psychological Space "No. 2".



Source: Murphy, 1947, p. 883

The diagram of $\mathbf{S_1}$ in Figure 2 can be thought of as the instance, typical in laboratory research, in which an individual with little or no prior training or experience must understand and react to a situation. For the reasons extant social-cognitive theory describes, this person is likely to draw on his or her socially-shared understanding of the stereotypic warmth and competence of those involved, use these inferences to ascribe a meaning to the situation, and act accordingly: $\boldsymbol{\pi_1}$. Thus, RPW_{BL} – the relative warmth ratings of the parties in a case made by an independent sample of untrained individuals – should predict the decisions of individuals in Field $\boldsymbol{\pi_1}$.

In addition, CCAM recognizes $\mathbf{S_2}$, the instances in which an individual has training or experience that provides domain-specific alternatives for categorizing and ascribing meaning to the situation. Under this circumstance, it predicts an alternative

field, $\boldsymbol{\pi_2}$, in which individuals draw on situation categories that are not available to otherwise identical individuals who lack the appropriate training or expertise. As a result, RPW_{BL} should *not* predict decisions of individuals in $\boldsymbol{\pi_2}$. Thus, whether person **O** exhibits $\boldsymbol{\pi_1}$, and appears biased because he or she derived the meaning of a situation from socially-shared stereotypes, or $\boldsymbol{\pi_2}$, in which he or she does not appear biased because other, social-category neutral sources of meaning were available, depends upon the match between the individual's training and experience and the sort of decisions he or she is making.

Main effects. Table 1 describes the expected pattern of basic results for a test of CCAM across the dimension of the expected extent of transfer under four distinct propositions. (Note that the axes in the table are transposed from those depicted in Figure 2.)

Table 1. Predicted Results Across Propositions Regarding Strength of Situation Categories Relative to Social Categories

	No CCAM	**CCAM**		
		Weak Limit	**Mean**	**Strong Limit**
	RPW_{BL} Significant Predictor?	RPW_{BL} Significant Predictor?	RPW_{BL} Significant Predictor?	RPW_{BL} Significant Predictor?
No Training	Yes	Yes	Yes	Yes
Training: No Transfer[12]	Yes	No	No	No
Training: Near Transfer	Yes	Yes	No	No
Training: Far Transfer	Yes	Yes	Yes	No

[12] Here the term "No Transfer" refers to situations of over-learning (i.e., when the stimuli to which learned categories are to be applied are identical to those presented in the training materials used to teach the case categories themselves).

The first possibility, represented in the left-most column, is the true null hypothesis (i.e., that CCAM is false). If this is the case, then people with relevant situation-category training will not differ from those without such training in the magnitude of the activation or application of default social categories. In Field Theory terms, $\pi_1 = \pi_2$. This leads to general Hypothesis 1:

> H1: In deciding case examples, participants who have learned a relevant legal category will activate and apply social categories to the same extent as those who have not done so.

Next is the weak limit of CCAM. As with training in highly stimulus-specific response rules for dots and guns, the weak limit suggests that the effects of training are closely tied to the surface structure of the training stimulus. Accordingly, it predicts that individuals who learn to use legal categories to guide their inferences, judgments, and decisions will activate and apply the categories when deciding case vignettes but that this will occur *only* when the individuals are deciding the *very same* case examples that they studied during training. Given that the two are identical, participants can do this without having encoded the substance of the case category at any depth at all; they need only recognize the case example from training and remember the appropriate response. (Indeed, Skinner's (1961) research teaching pigeons to "read" words suggests that this is a task animals could successfully accomplish.) This leads to general Hypothesis 2:

> H2: In deciding case examples, participants who have learned a relevant legal category will recognize the case examples from training as cases that they have seen before and decide them accordingly; however, for all other

case examples they will activate and apply social categories to the same extent as participants that have had no training.

The third possibility, the mean, represents the middle ground between the strong and weak limits of the CCAM. It predicts that individuals will be able to engage in some transfer of their legal category training. Thus, participants will be able to use legal categories rather than default social categories to decide case examples studied in training as well as those that are fairly similar in surface structure to the training examples. This leads to general Hypothesis 3:

H3: In deciding case examples, participants who have learned a relevant legal category will recognize and correctly categorize example cases that they have seen in training, as well as other case examples with similar surface features, and decide both types of cases accordingly; however, for all other case examples they will activate and apply social categories to the same extent as participants that have had no training.

Fourth is the strong limit of the CCAM. It predicts that legal category training will have precedence over default social categories for defining the meaning of the situation in cases with a similar structure (surface or deep) to that used in training. In short, participants will encode the legal categories and associated responses at a sufficient level of depth, such that they are activated and applied to all of the relevant case examples, irrespective of similarity in surface structure of the examples to those used in training. This leads to general Hypothesis 4:

H4: In deciding case examples, participants who have learned a relevant legal category will recognize and correctly categorize the example cases that fit into that category and decide the cases accordingly; however, for all other case examples they will activate and apply social categories to the same extent as participants that have had no training.

Moderator. As noted above, under CCAM, indeterminacy in implication and response is generally a characteristic specific to a particular situation category. The greater the indeterminacy of a situation category, the lower its effectiveness at displacing the influence of social categories. Here, variation on this dimension is operationalized through the type of legal category: The categories of ultra-hazardous activities and no affirmative duty cases are relatively detrminate; the category of negligence cases is relatively indeterminate. This leads to general Hypothesis 5:

Hypothesis 5: For each hypothesis H2 – H4, legal category training in negligence cases will be less effective at attenuating the effects of activation or application of social categories than legal category training in ultra-hazardous activities and no affirmative duty cases. Moreover, for case examples in which the legal category and social categories suggest the same outcome, the influence of each will be additive in negligence cases so that judgments on such cases will be more extreme.

Method

Overview.

The general predictions of the CCAM were tested with three experimental studies. In each, participants read short summaries of the facts of situations in which one or more individuals are seeking damages from another as a result of some harm. All summaries, 24 in total, were paragraph-long descriptions consistent with the length and content of those provide for illustrations in the Restatements of Tort Law. Each was based on the facts of an actual case that has been found by a court to fit into one of the three categories of tort described above. In addition, the social categories to which the parties belong were varied to produce patterns of levels of relative warmth and thus a particular expected liability judgment that would be based upon the use of social, rather than legal, cues. Following are two sample case vignettes from the ultra-hazardous activity category:

> Linda Wilson was recently widowed. In order to earn money to supplement her social security income and the remainder of her late husband's pension, she started renting the apartment above the garage of her small home in New Jersey. Her first tenants are two 19-year-old men, Donnel White and Tyrone Johnson. Shortly after moving in, the tenants decide to change the bulbs in one of the bedrooms to black lights. At their request, Mrs. Wilson lends them a ladder which hangs on the side of the garage. Unbeknownst to Mrs. Wilson, the ladder is defective and very prone to collapse. While they are changing the lights, the ladder closes suddenly; Tyrone breaks his wrist badly in the fall, requiring surgery.
>
> Uninsured, Tyrone (The Plaintiff) sues Mrs. Wilson (The Defendant) for the $29,000 hospital bill.

> MetroProperties, Inc. owns and manages several suburban rental properties. Bill Hopkins, a recent university graduate with a degree in civil engineering, rents a ground floor apartment in one of the properties. Wanting to create a raised platform for his grill to protect the small porch, Mr. Hopkins borrows a gas power saw from the maintenance crew that services his building. Unfortunately, the set screws (i.e., the screws that are intended to keep the blade in alignment) were poorly designed and become loose when

the saw is on. Having never checked the set screws, the crew is unaware of this problem. As a result of the defect, while Mr. Hopkins is using the saw, the blade comes loose causing the saw to jump into his leg injuring it severely.

Mr. Hopkins (The Plaintiff) sues MetroProperties (The Defendant) for the $20,000 cost of the treatment of his injuries.

(for the remaining case examples see Appendix A).

Table 2 summarizes the characteristics of the base set of case examples used in the studies.

Table 2: Cases Examples in Base Set by Factor Characteristics

	No Transfer		**Near Transfer**		**Far Transfer**	
	Plaintiff Warmer	*Defendant Warmer*	*Plaintiff Warmer*	*Defendant Warmer*	*Plaintiff Warmer*	*Defendant Warmer*
Ultrahazardous Activity (Defendant Liable; Legal Category Determinate)	1	1	1	1	1	1
No Affirmative Duty (Defendant Not Liable; Legal Category Determinate)	1	1	1	1	1	1
Negligence (Defendant Liable; Legal Category Indeterminate)	1	1	1	1	1	1
Negligence (Defendant Not Liable; Legal Category Indeterminate)	1	1	1	1	1	1

Thus, the 24 case examples represent a 2 Legal Category Outcome factor (Liability, No Liability) X 2 (Relative Party Warmth Advantage: Plaintiff, Defendant) X 3 (Transfer: No, Near, Far) X 2 Legal Category Indeterminacy factor (High, Low) within-participants design.

Dependent measures. For each case example there were three dependent measures. In the first, *Liability Decision*, participants indicated the extent to which they believed that liability was appropriate in the case on an eight-point Likert-scale item

anchored at 1 = Definitely Not Liable and 8 = Definitely Liable. Although continuous, the even number of response options effectively made this a forced-choice measure such that responses of four or less indicate a decision of no liability, while those five or greater indicate a decision of liability. The second dependent measure is *Legal Accuracy*. It consists of an indicator code for whether the ultimate dichotomized outcome of a Liability Decision (i.e., no liability or liability) would coincide with that made by the judge or judges in the underlying case. Finally, for the third dependent measure, *Decision Confidence*, participants indicated the extent they were confident that their decision for the example was legally correct. The item was assessed on a seven-point Likert-scale item anchored at 1 = Not at all Confident and 7 = Absolutely Confident.

Relative party warmth. In the Pilot Study, Study 1, and Study 2, RPW is computed as a function of participants' responses to four-item Likert scales assessing their perception of the warmth of each party. Responses on the items for each party were averaged and the score for defendant-warmth subtracted from that of plaintiff-warmth. In Study 3, rather than four items for each party, participants completed only one. Positive scores on the variable indicate a relative warmth advantage for the plaintiff.

Social base-line predictor analysis. The RPW ratings for the case examples are also the basis for computing a predictor of participants' use of social categories in making Liability Decisions: Base-line RPW (RPW_{BL}). As discussed above, the fundamental assertion of social-cognitive theory is that bias occurs when individuals place others into social categories and then rely upon socially shared associations between those categories

and stereotypical individual characteristics to understand, and determine how to respond to, a situation.

That bias often results from a common-social, rather than individual-idiosyncratic, process is illustrated by research employing what I refer to as Social Base-line Predictor Analysis. In this method, whether and the extent to which judgments in one, frequently real-world setting are biased is estimated by using independent ratings of common stimuli on some stereotypical trait or characteristic to predict them. For example, using photographs in the public record, Eberhardt, Davies, Purdie-Vaughns, and Johnson (2006) found that the ratings made by a sample of students of the racial stereotypicality of convicted criminals predicted whether the convicts were actually given the death penalty versus life in prison. Similarly, again using black-and-white publically available photographs, Todorov, Mandisodza, Goren and Hall (2005) showed that independent ratings of how competent the features of candidates for U.S. Senate were predicted whether they were actually elected to office.

Here, the RPW_{BL} ratings for a case (i.e., the mean RPW rating for the case from an independent sample of untrained individuals) serve the same purpose as the ratings of the photographs in the studies above. The ratings reflect the common, socially shared perception of the relative warmth of the parties in a given case vignette. Thus, to the extent participants are relying upon those social categories and the common stereotypic associations with them, the independent ratings of individuals without training should positively predict their Liability Decisions. Indeed, that is the basic prediction of the SCM and much of social-cognitive theory generally for all but the most motivated,

individuated judgments. Not so with CCAM. Rather, to the extent CCAM is correct, participants who have been trained in a relevant legal category should *not* rely upon the parties' social categories and associated levels of characteristic warmth when making their liability decisions. As a result, the RPW_{BL} should *not* predict the decisions of those participants.

Individual differences. Finally, as controls for potentially relevant individual differences (see n. 7), participants completed multi-item Likert-scale type measures of their perceived self efficacy (Chen, Gully, & Eden, 2001), motivation to participate in the study (an original measure), contentiousness (Soto & John, 2009), and cognitive ability (operationalized as self-reported standardized test scores, e.g. ACT and LSAT) (for selections from the survey see Appendix B). Further, for exploratory purposes, they completed measures of Right Wing Authoritarianism (Altemeyer, 1996), which has been found to relate to general punitiveness (Altemeyer, 1996) and thus perhaps the willingness to impose liability, Motivation to Control Prejudice (Plant & Devine, 1998), which may reduce the effects of RPW_{BL} on Liability Decisions of participants even in the no-training conditions, and Social Dominance Orientation (Pratto, Sidanious, Stallworth, & Malle, 1994), which is a predictor of stereotyping and prejudiced judgments (Whitley, 1999), and thus may increase the effects of RPW_{BL} on judgments.

Procedure. Using this basic paradigm, in Study 1, participants decided all 24 cases having completed no training, training in the negligence case category (high indeterminacy legal category), or training in the ultra-hazardous and no affirmative duty case categories (low indeterminacy legal categories). Study 2 extended the first by

combining the training such that participants received either no training or training in all three case categories. Studies 1 and 2 thus provide two independent tests of the hypotheses, the first when the indeterminacy moderator is a between-participant variable and the second when the moderator is a within-participant variable. Finally, Study 3 tests the hypotheses under conditions of greater naturalistic expertise. In particular, Study 3 is a replication of Study 2 using a population that has receive more extensive training on legal categorization generally and tort case categorization in particular: Law students who have completed a class in tort law.

Pilot Study

The central purpose of the pilot study was to test whether the stimuli conformed to the example-case characteristics depicted in Table 2. This involved three steps. First, legal cases were located that had been decided by an appellate court using the appropriate legal rule. Such cases have a known, legally correct outcome. Of these, specific cases were chosen, the facts of which would conform to the pattern necessary to test the effects of transfer. Then paragraph-long summaries of the facts of the cases were drafted. Second, drawing on the SCM, two versions of each case example was prepared so that use of social cues (i.e., the relative warmth of the parties) would result in particular liability judgments orthogonal to those of the legal decisions. Third, the example case scenarios were pilot tested for the extent to which they conformed to the predictions of the SCM. Of the two, the one that best conformed and met the required pattern depicted in Table 2 was selected for use in the remaining studies.

***Participants*.** Participants for the pilot study (N = 179) were recruited from the University of Minnesota Psychology Research Experience Program (REP) pool. They received extra credit in a psychology course for their participation. Their ages ranged from 18 to 40 (M_{DN} = 20); 56% were Female; 74% self-identified as white, and 90% were native English speakers.

***Materials*.** The pilot study was administered online via Qualtrics (Qualtrics Labs Inc., 2009). Two versions of 24 summary cases examples were prepared. Each was a paragraph-long description of the facts of an actual legal case that involved a situation in which an individual or individuals, the plaintiff(s), were harmed and are seeking damages from another or others, the defendant(s), as compensation for the harm (example case summaries are provided in Appendix A). To locate the cases, searches were conducted in Westlaw for appellate opinions for cases that were decided as a matter of law using one of the legal categories of interest. Of these, six cases were selected in each category based upon three criteria. First, to facilitate the creation of summary vignettes, the appellate opinion had to contain a detailed statement of facts that clearly indicated the circumstances under which the case arose. Second, cases were selected such that the underlying facts of two pairs of two of the cases in each legal category were sufficiently similar to enable the construction of a near-transfer case that had some of the same surface features as those of the training case. Finally, to enable a far transfer condition, the last pair of two cases in each legal category was selected so that they would not contain any surface similarities to the training case, near transfer case, or each other. Thus, for example, one pair of Negligence (Liability) cases involved situations in which

the plaintiff tripped and fell over a sidewalk and grocery store entry-way mat, respectively, while a third involved a defendant that gave a boy a ride in the bed of his pick-up truck. Citations to the cases selected are provided in Appendix D.

Three of the six, including one from each pair, were then designated to be altered so that the social categories of the parties involved would, according to the SCM, favor a judgment of liability (i.e., the plaintiff would be viewed as warmer than the defendants) and the other three altered to produce the opposite result. The two versions of each case used different social-category combinations to help ensure that at least one version was consistent with the predictions of the SCM and thus could be used in Studies 1 through 3.

Dependent measures included a four-item assessment of perceptions of warmth of each party, for a total of eight-items. SCM (Cuddy, Fiske, & Glick, 2008) states that the warmth dimension is primary and related to active helping or harming of other groups, whereas competence is related to passive actions. Warmth thus leads to the clearest predictions for the effects of stereotyped perceptions on this dimension for judgments of this kind. In addition, the pilot test included four-item measures of the competence of each party, for a total of eight-additional items. As the predictions of SCM for the effects of relative competence of the parties are less clear, these were included for the purposes of exploration. Finally, participants responded to the Liability Decision item, measures of individual differences, and basic demographic characteristics (for selections from the survey see Appendix B).

Procedure. Members of the REP pool were solicited for their interest in participating in an online study of social stereotype identification. Interested individuals

were e-mailed a link to the survey. Those who followed the link read and electronically signed a consent form. Following consent, participants were randomly assigned 12 cases to read with the restriction that no participant would read both versions of the same case. participants were then shown an instruction screen explaining that they will read a series of 12 summaries of legal cases in which one person is accusing another of causing them harm. After each, they would complete a set of survey items about their perceptions of the people in the cases and indicate the appropriate result of the case. Participants were then shown the cases in random order. Once all 12 sets of responses were completed, participants were asked to respond to the individual difference measures and demographics questionnaire. Finally, participants were shown a debriefing screen and thanked for their participation.

Analysis and Results. The means, standard deviations, reliability coefficients (where applicable) of, and zero-order correlations between, the measured variables are given on Table 3.

Table 3: Pilot Study Zero-Order Correlations of Primary Measured Variables						
	PW	PC	DW	DC	LD	DC
Plaintiff Warmth (PW) (α=.92, M=4.46, sd=1.88)	-	2102	2100	2099	2054	2000
Plaintiff Competence (PC) (α=.89, M=4.77, sd=1.79)	**.74**	-	2100	2099	2054	2000
Defendant Warmth (DW) (α=.91, M=4.55, sd=1.83)	**.43**	**.39**	-	2099	2052	1998
Defendant Competence (DC) (α=.89, M=4.64, sd=1.77)	**.40**	**.43**	**.70**	-	2051	1997
Liability Decision (LD) (M=4.73, sd=2.14)	**.27**	**.28**	**-.18**	**.05**	-	1980
Decision Confidence (DC) (M=6.08, sd=2.35)	**.11**	**.13**	.05	.07	**.17**	-

Notes: Values above and below the diagonal are sample sizes and correlation coefficients, respectively. All bolded coefficients were statistically significant at $p < .01$, after adjusting for multiple tests. P-values were adjusted for multiple tests, but not for the lack of independence between raters or in the underlying cases to which the rating and decisions refer.

As indicated in the table, the ratings of Warmth and Competence of a given party are highly positively related with each other. Moreover, the inter-party Warmth and Confidence ratings are also positively correlated, but not to the same extent as those of the intra-party ratings. Participants'' ratings of Plaintiff Warmth and Competence are positively related to their judgments of liability and, albeit less so, to their confidence that their decision was legally accurate. By comparison, participants' ratings of Defendant Warmth are negatively related to liability decisions, whereas ratings of Defendant Competence appear to have less influence. Neither Defendant Warmth nor Competence are significantly related to participants' confidence in the legal accuracy of their decisions.

To create a measure of RPW, the warmth ratings for each party for each of the 2 versions of the 24 cases were obtained and the difference scores for each computed. The

means and significance levels for RPW and Liability Decisions for each version of each case, as well as the indicator code for Legal Liability (i.e., the legal decision in the case; 1 = Liability) are given on Table 4. The text of each of the selected case examples is given in Appendix A.

Table 4: Pilot Test Ratings of Relative Party Warmth and Liability Decisions

Case Codes	LL	Case Version 1		Case Version 2	
		RPW_{BL}	Mean Liability Decision	RPW_{BL}	Mean Liability Decision
H37	1	-0.72*	-0.21	-0.23	-0.15
T18	1	-1.71***	-1.08***	-1.50***	-0.52+
F54	1	-0.02	1.83***	0.44	1.86***
C94	1	-0.48	0.17	-0.56*	0.35
Y23	1	0.10	0.36	0.18	0.31
P72	1	-0.06	0.94**	-0.36	1.01**
X40	0	0.59+	0.38	0.50+	0.14
S77	0	1.02**	0.95**	1.56***	0.75*
I84	0	-1.35***	-0.70*	-1.17***	-0.57+
W59	0	-0.55*	-0.86**	-0.31	-0.98**
N05	0	1.43***	1.30***	0.91***	1.82***
L13	0	0.55	0.34	0.28	-0.41
D45	1	-0.40+	-0.14	-0.09	0.33
E80	1	-0.90**	-0.07	-0.88**	0.08
G30	1	0.79**	1.55***	0.46+	1.43***
U29	1	-1.45***	-1.71***	-0.64*	-1.24**
A61	1	0.39	0.37	0.11	0.20
O89	1	0.05	1.09***	-0.14	0.93**
F23	0	-0.19	0.52	0.06	0.38
H25	0	-0.89***	-0.98**	-0.56**	-0.63+
K93	0	0.34	0.81**	0.77**	0.32
R68	0	-0.45+	-0.90**	-0.54*	-1.57***
P72	0	-0.04	0.14	-0.41	-0.72*
V08	0	0.66*	1.80***	0.81**	1.60***

Notes: + = (.10 > p > .05); * = (.05 > p > .01); ** = (.01 > p > .001); *** = (p < .001). LL = Legal Liability. Shaded cells indicate case versions selected for use in Studies 1 through 3. Case Codes were generated at random.

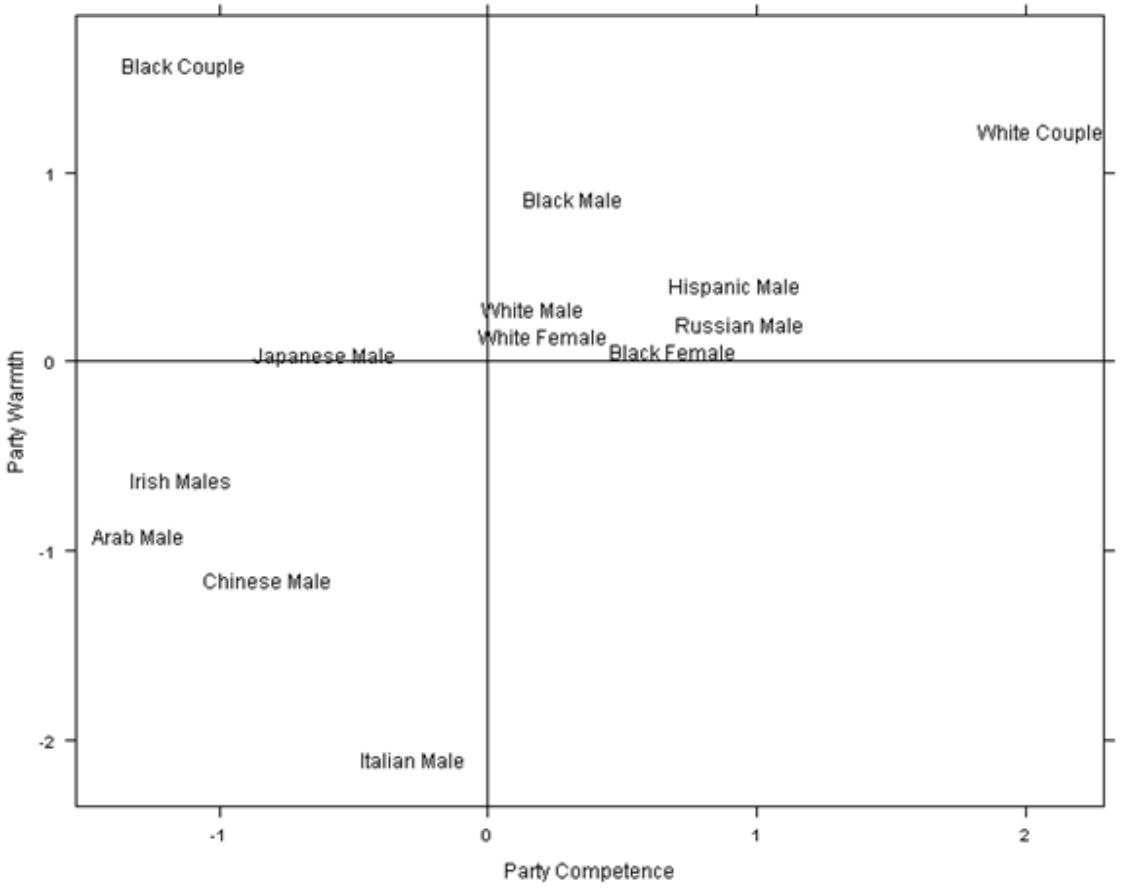
Mixed effects models were then used to test whether the case examples conformed to expectations and the pattern required for Studies 1 through 3 while controlling for lack of independence in raters and cases.[13] First, the RPW ratings were regressed on an indicator code for whether the case was prepared such that social cues should produce a judgment of liability: Social Liability (Pilot M1). The result was significant in the expected direction (see Table 5) indicating that, overall, the example cases were constructed such that plaintiffs would be seen as warmer or colder than defendants had the intended result. Next, continuing to control for lack of independence, Liability Decisions were regressed on Social Liability (Pilot M2). The result was highly significant (see Table 5), providing further evidence that, overall, the example cases functioned as expected. Finally, again controlling for lack of independence, Liability Decision for each case was regressed on RPW (Pilot M3). The result was also a highly significant positive relationship (see Table 5) such that when participants viewed plaintiffs as warmer than defendants, they tended to indicate that the defendant was liable. These results broadly support use of the insights from the SCM to construct case vignettes that systematically yield particular warmth ratings and liability judgments as well as the use of RPW_{BL} to predict use of social categories in decision-making.

[13] The statistical program R was used for all analyses (R Development Core Team, 2011). Mixed effects models were fitted using the lmer() function in the lme4 package (Bates, Maechler, & Bolker, 2011) in R. *P*-values for regression coefficients were estimated using the pvals.fnc() in the language R package (Baayen, 2011) in R; *p*-value estimates derived from the *t*-tests and Monte Carlo simulation were not substantively different from those derived from Monte Carlo simulation unless otherwise noted.

Table 5: Manipulation Check Tests of Social Liability and Relative Party Warmth in Pilot Study												
	Pilot M1: All Case Versions (RPW_P)						Pilot M2: All Case Versions (Liability Decision)					
	df	***F*-value**	***p*-value**	**b**	**se**	***p*-value**	**df**	***F*-value**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				-.32	.15	.032				4.31	.18	<.001
Social Liability	1	4.62	.032	.44	.21	.032	1	11.56	<.001	.83	.24	<.001
	Pilot M1: Selected Versions (RPW_P)						Pilot M2: Selected Versions (Liability Decision)					
	df	**F-value**	***p*-value**	**b**	**se**	***p*-value**	**df**	**F-value**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				-.57	.17	.001				3.90	.18	<.001
Social Liability	1	14.50	<.001	.92	.24	<.001	1	39.72	<.001	1.57	.25	<.001
	Pilot M3: All Case Versions (Liability Decision)						Pilot M4: All Case Versions (Liability Decision)					
	df	**F-value**	***p*-value**	**b**	**se**	***p*-value**	**df**	**F-value**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				4.76	.12	<.001				4.29	.25	<.001
RPW_P				.40	.02	<.001	1	11.31	<.001	.66	.35	.043
Legal Liability (LL)	NA						1	.60	.44	.03	.35	.927
RPW_P x LL							1	.44	.51	.33	.49	.470
	Pilot M3: Selected Versions (Liability Decision)						Pilot M4: Selected Versions (Liability Decision)					
	df	**F-value**	***p*-value**	**b**	**se**	***p*-value**	**df**	***F*-value**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				4.71	.17	<.001				3.67	.25	<.001
RPW_P	1	133.20	<.001	.36	.03	<.001	1	38.87	<.001	1.82	.36	<.001
Legal Liability (LL)	NA						1	.64	.425	.45	.36	.200
RPW_P x LL							1	.93	.335	-.49	.50	.308
Notes: RPW_P = Standardized Relative Party Warmth ratings from the Pilot Study.												

Next, using the mean RPW ratings (i.e., RPW_{BL}) and Liability Decisions, one version of each of the case examples was selected for use in Studies 1 through 3. The case versions selected are indicated in Table 4 with shading. Figure 4 depicts the average warmth and competence ratings for members of various social categories included in the selected versions. With some exceptions (e.g., black men & Japanese men), the ratings conform largely to prior work on the SCM.

Figure 4: Pilot Study Ratings of Warmth and Competence of Parties by Social Category



Notes: Ratings of warmth and competence are standardized.

Pilot M1 through M3 were then rerun using only the selected subset of cases (see Table 5). All effects were comparable to, or higher in magnitude than those from the analysis using both versions of the cases.

For an ideal test of CCAM, Liability Decisions resulting from social cues embedded in the example cases would be orthogonal to those expected from participants who are using the legal categories. To assess the feature in the selected versions of the cases, Pilot M2, in which Liability Decisions were regressed on the RPW, was repeated adding indicator codes for Legal Liability and for the interaction between RPW and Legal Liability (Pilot M4). The result conformed to expectations. In particular, RPW continued to be a highly significant positive predictor of liability, while neither Legal Liability nor the interaction term were significant (see Table 5).

Discussion

The pilot study is designed to test the basic proposition, based upon the SCM, that common social-category cues influence party warmth ratings, which in turn affect liability judgments. In addition, the results enabled selection of the versions of each case example that best conformed to the expected differences in warmth and the associated Liability Decision necessary to create the base set of cases described in Table 2.

Study 1

Overview and Design. Study 1 represents an initial test of the CCAM hypotheses with the moderator, category determinacy, manipulated between participants along with a no-training control condition. Thus, participants in the training conditions were randomly assigned to receive instruction on either the negligence case category or the

ultra-hazardous and no-duty legal categories. This design permits not only a test of the hypotheses, but also of the extent to which the training process itself and the accuracy incentive included in the study (see below), affect decisions even on cases to which the training does not apply. More particularly, Study 1 follows a 2 (RPW_{BL} response: Liability, No Liability)[14] X 2 (Legal Category Response: Liability, No Liability) X 3 (Case-Category Training Match: Yes, No, Control) X 3 (Transfer: No, Near, Far) X 2 (Legal Category Indeterminacy: Determinate, Indeterminate)[15] mixed factorial design. Legal Category Indeterminacy is a between-participants factor; the remaining factors are manipulated within participants. The design for study is illustrated in Table 6. As shown in Table 6, in this design, the transfer factor and "Yes" level of the Case Training Match factor are not meaningful for case examples, the legal category for which participants did not receive training.

Dependent measures are Liability Decision, Legally Accurate, and Decision Confidence, each described in the overview section.

Participants. Participants for Study 1 (N = 62) were recruited from the University of Minnesota Psychology REP pool and awarded course credit for their participation. As described in more detail below, 10 participants also received $40 as part of an incentive

[14] In Study 1, RPW_{BL} is operationalized using mean RPW ratings from the pilot. Thus, cases with positive relative warmth ratings are those for which social categorization is expected to result in more judgments of liability, whereas, in those with negative relative warmth ratings, social categorization is expected to produce judgments of no liability. Although described dichotomously, the variable is continuous.

[15] Legal Category Determinacy is operationalized as training in ultra-hazardous and no affirmative duty cases; Legal Category Indeterminacy is operationalized as training in negligence cases.

Table 6: Study 1 Design						
Social Category Response	Legal Category Response	Case Training Match	Transfer	**Legal Category Indeterminate**	**Legal Category Determinate**	**Control**
Liability (Positive RPW_{BL})	Liability	Yes	No	21	21	
			Near	21	21	
			Far	21	21	
		No	N/A	63	63	120
	No Liability	Yes	No	20	21	
			Near	21	21	
			Far	21	21	
		No	N/A	63	63	120
No Liability (Negative RPW_{BL})	Liability	Yes	No	21	21	
			Near	21	21	
			Far	21	21	
		No	N/A	63	63	120
	No Liability	Yes	No	19	21	
			Near	21	21	
			Far	21	21	
		No	N/A	63	63	120
Notes: Between-participants factor levels are in bold. Cell values indicate the number of cases in the cell included in the Study 1 sample.						

to pay attention to and apply the training. Participant ages ranged from 18 to 49 (MDN = 20); 56% were female; 76% self-identified as white, 8% Asian, 6% black, 2% Hispanic, and 6% other; and 90% were native English speakers. Further, participants had completed 0 to 12 semesters of college (MDN = 3) and their GPAs, where available, ranged from 2.0 to 3.9 (MDN = 3.4).

Materials. Stimuli for Study 1 were presented on computers in a laboratory in Elliott Hall. Survey items and responses were presented and recorded on a paper packet prepared for that purpose (for selections from the survey see Appendix B). Summary

cases were the selection of paragraph-long descriptions of the facts of legal cases selected through the Pilot Study (case summaries are provided in Appendix A). Training materials for each tort category consists of a an anticipatory set in the form of a clip from the movie *Legally Blond* (Kidney, Platt, & Luketic, 2001) depicting Elle Woods' first day in a law school class and guided analogical encoding exercises adapted from that used by Gentner, Loewenstein, and Thompson (2003) (for examples see Appendix C). The exercise involved instructions identifying the relevant legal category and its implications for judgment, an illustration of the application of the category to two of the summary cases, and a follow-up exercise in which participants apply the rule to the two exemplar summary cases.

In addition to measures of Liability Decision and Decision Confidence, participants completed individual difference controls with respect to the ability to transfer training (i.e., Big-Five conscientiousness, perceived self-efficacy, motive to do well on the study, grade-point average, and SAT/ACT score) as well as the tendency to control bias (i.e., motivation to control prejudice), be punitive (i.e., Right-Wing Authoritarianism), or prefer social hierarchy (i.e., Social Dominance Orientation), and basic demographic characteristics (for selections from the survey see Appendix B).

Study 1 also required $400 for use as an accuracy incentive.

Procedure. Members of the REP pool were solicited for their interest in participating in a two-hour study of whether legal rules provide guidance to parties as to how to resolve their disputes or, alternatively, are so intuitive that knowing such rules does not aid parties in a dispute beyond what they already know as a matter of common

sense. Interested individuals were asked to register to attend one of several available computer lab sessions. Upon arrival at a session, individuals were directed to sign in, turn off their cell phones, and sit at an available computer. Once there, they were given a consent form to read and the opportunity to ask questions about the study. Participants were then given a survey packet and directed to begin the study.

Using a random number placed on the sign-in sheet for that purpose, participants were assigned to one of three conditions: No training, training in negligence cases, or training in ultra-hazardous and no affirmative duty cases. In each condition, participants first complete a short survey measuring their level of conscientiousness, perceived self-efficacy, and motive to do well on the study. Once completed, they got the attention of a researcher, who then started the training presentation, delivered on PowerPoint, for their condition. In each case, the presentation started with basic instructions for the training, including how to advance the PowerPoint slides. Following this screen, all participants were shown the video clip. After the clip, participants in the no-training condition were shown an instruction screen explaining that they could continue with their packet. At this time, a researcher started a second PowerPoint presentation containing the example cases in one of five random orders. Which of the five orders used was determined using a random number placed on the sign-in sheet for that purpose. Participants in the condition then read the 24 example cases 1 at a time. After each, on their survey packet they completed warmth and competence ratings of the parties, indicated the appropriate result of the case and their confidence that this was the legally accurate result, and finally provided a very short statement indicating the primary basis for the decision. Once all 24

were completed, participants were asked to indicate their best guess as to the hypothesis in the study and to respond to the remaining individual difference measures and demographics questionnaire. After completing the packet, participants read a short debriefing sheet and were directed to see the experimenter, who asked whether they had any additional questions, thanked them, and excused them.

In the training conditions, following the movie clip, participants were given instructions describing the training materials and decision task. In addition, they were encouraged to take the training seriously and, as an incentive to do so, told that the 10 participants in the study who apply the training most accurately in the decision task would each receive $40. Each then completed the training appropriate to their condition on the PowerPoint slides. Following training, these participants completed the study using the same procedure as those in the no-training condition. When the study was completed, the 10 participants who had the highest proportion of legally correct decisions were contacted and given $40.

Analysis

Data preparation. Prior to analysis, scores were computed for each scale and its reliability computed and recorded. Table 7 lists the reliability (where applicable), mean, and standard deviations for all of the measured variables in Study 1, as well as the zero-order correlations between them. As in the Pilot Study, inter-party ratings of warmth and competence were highly related. Moreover, judgments of Plaintiff warmth and competence were significantly positively correlated with Liability Decisions, whereas the

opposite was true of ratings for Defendants. None of the zero-order correlations between individual differences and Liability Decisions were significant.

Table 7: Descriptive Statistics and Zero Order Correlations for Measured Variables in Study 1

	PW	PC	DW	DC	SE	C	SM	MCP	EMCP	IMCP	RWA	SDO	CA	LD	LA	Cf
Plaintiff Warmth (PW) (α=.91, M=5.5, SD=1.6)	X	1478	1475	1478	1455	1455	1431	1479	1479	1479	1383	1410	1359	1479	1479	1477
Plaintiff Competence (PC) (α=.89, M =5.6, SD =1.6)	**.68**	X	1478	1474	1477	1454	1454	1430	1478	1478	1478	1382	1409	1358	1478	1478
Defendant Warmth (DW) (α=.91, M =5.1, SD =1.7)	**.18**	**.12**	X	1476	1475	1453	1452	1428	1476	1476	1476	1381	1407	1356	1476	1476
Defendant Competence (DC) (α=.86, M =5.3, SD =1.6)	**.17**	**.21**	**.67**	X	1475	1479	1455	1455	1431	1479	1479	1479	1383	1410	1359	1479
Self Efficacy (SE) (α=.87, M =5.7, SD =.7)	.04	-.01	-.07	-.07	X	60	59	61	61	61	58	58	56	1461	1461	1459
Contentiousness (C) (α=.71, M =5.3, SD =.8)	.08	.14	.03	.06	.15	X	59	61	61	61	57	58	56	1461	1461	1459
Study Motivation (SM) (α=.80, M =4.9, SD =.8)	-.04	.02	-.07	-.05	.34	.25	X	60	60	60	56	57	55	1437	1437	1435
Motivation to Control Prejudice (MCP) (α=.82, M =4.1, SD =.8)	-.02	.01	.00	.01	-.08	**.41**	-.01	X	62	62	58	59	57	1485	1485	1483
External (EMCP) (α=.82, M =4.3, SD =1.0)	.00	.02	.01	.02	.04	**.40**	.14	**.90**	X	62	58	59	57	1485	1485	1483
Internal (IMCP) (α=.69, M=3.8, sd=1.0)	-.03	-.02	-.01	.00	-.21	.28	-.20	**.76**	**.39**	X	58	59	57	1485	1485	1483
Right Wing Authoritarianism (RWA) (α=.70, M =4.0, SD =.8)	**.18**	**.15**	.05	.07	.04	.18	.14	-.09	.03	-.24	X	56	53	1389	1389	1387
Social Dominance Orientation (SDO) (α=.90, M =2.7, SD =1.0)	**.11**	.07	.02	.06	-.02	-.19	-.21	-.36	-.33	-.27	.37	X	54	1414	1414	1412
Cognitive Ability (CA) (M =27.3, SD =3.8)	**.10**	.00	**.15**	.07	.11	-.11	-.22	.07	.07	.06	-.27	.05	X	1365	1365	1363
Liability Decision (LD) (M =4.7, SD =2.7)	**.23**	**.24**	**-.19**	**-.23**	.02	.01	-.03	-.01	.00	-.02	.02	.06	-.03	X	1485	1483
Legally Accurate (LA) (M =.6, SD =.5)	.04	.02	**.10**	.08	-.01	-.04	-.01	.02	.02	.01	.01	.03	-.02	-.02	X	1483
Confidence (Cf) (M =5.2, SD =1.7)	**.14**	**.09**	.04	.04	.08	**-.16**	**.14**	-.03	-.03	-.03	**.30**	**.22**	-.05	.08	**.19**	X

Notes: Values above and below the diagonal are sample sizes and correlation coefficients, respectively. All bolded coefficients were statistically significant at p < .05, after adjusting for multiple tests. *P*-values are not adjusted for the lack of independence between raters or in the underlying cases.

Base-Line Relative Party Warmth. Employing Social Baseline Predictor Analysis, the predictor of the activation and application of social categories in Study 1 is the independent RPW ratings from the Pilot Study, or Pilot Base-Line Relative Party Warmth (RPW_{PBL}).[16] RPW_{PBL} was computed as the mean of the difference of Plaintiff Warmth and Defendant Warmth ratings in each case example in the Pilot Study. Table 8 lists the values of the variable for each case example. In addition, Table 8 provides the mean RPW ratings of untrained participants from Study 1 (RPW_{S1}), Study 2 (RPW_{S2}), and Study 3 (RPW_{S3}), as well as the grand mean RPW from the Pilot and Study 1 (RPW_{PS1BL})[17]; Pilot, Study 1, and Study 2 ($RPW_{PS1S2BL}$)[18]; and the Total grand mean across all Studies (Total RPW_{BL}). The correlations between the scales are provided in the bottom rows of Table 8.

[16] Used as the RPW_{BL} in Study 1.
[17] Used as the RPW_{BL} in Study 2.
[18] Used as the RPW_{BL} in Study 3.

Table 8: Relative Party Warmth Ratings for All Studies							
Case	**RPW_{PBL}**	**RPW_{S1BL}**	**RPW_{S2BL}**	**RPW_{S3BL}**	**RPW_{PS1BL}**	**$RPW_{PS1S2BL}$**	**Total RPW_{BL}**
A61	0.11	0.43	-.15	1.50	.27	.13	.47
C94	-0.48	-0.85	-.83	-1.25	-.67	-.72	-.85
D45	-0.40	-0.60	.12	.36	-.50	-.29	-.13
E80	-0.90	-0.80	-.29	-.43	-.85	-.66	-.61
F23	0.06	0.00	.46	-.19	.03	.17	.08
F54	0.44	0.24	.25	.64	.34	.31	.39
G30	0.79	1.71	1.35	1.11	1.25	1.28	1.24
H25	-0.56	0.36	-.70	-.32	-.10	-.30	-.31
H37	-0.72	0.34	-.80	.35	-.19	-.39	-.20
I84	-1.35	-0.24	-.20	-.82	-.79	-.60	-.65
K93	0.34	1.23	.99	1.53	.78	.85	1.02
L13	0.28	0.74	1.15	.57	.51	.72	.69
N05	0.91	2.09	2.26	1.11	1.50	1.75	1.59
O89	-0.14	0.75	-.39	.82	.31	.07	.26
P23	-0.41	-0.28	-.85	.93	-.35	-.51	-.15
P72	-0.36	0.09	-.50	-.36	-.14	-.26	-.28
R68	-0.54	-0.83	-.88	1.18	-.68	-.75	-.27
S77	1.56	1.41	1.46	2.82	1.49	1.48	1.81
T18	-1.71	-0.30	-1.79	-.68	-1.01	-1.27	-1.12
U29	-0.64	-0.38	-.77	-.37	-.51	-.60	-.54
V08	0.66	1.29	1.42	1.11	.98	1.12	1.12
W59	-0.31	-0.11	-.46	.39	-.21	-.30	-.12
X40	0.59	0.45	.84	1.79	.58	.62	.91
Y23	0.10	1.13	.45	.68	.61	.56	.59
	PBL	**S1BL**	**S2BL**	**S3BL**	**PS1BL**	**PS1S2BL**	**Total BL**
PBL	X	24	24	24	24	24	24
S1BL	**.77**	X	24	24	24	24	24
S2BL	**.86**	**.81**	X	24	24	24	24
S3BL	**.79**	**.62**	**.61**	X	24	24	24
PS1BL	**.93**	**.95**	**.89**	**.75**	X	24	24
PS1S2BL	**.93**	**.92**	**.96**	**.71**	**.98**	X	24
Total BL	**.95**	**.89**	**.91**	**.84**	**.97**	**.98**	X

Manipulation check: Training. Study 1 is designed to test how the availability of legal categories learned in training affects use of social categories across the range of transfer at each level of the indeterminacy moderator variable. Accordingly, a preliminary issue is, irrespective of social category use, whether training affected participants' decisions at all. To the extent it did, participants should be able to decide case examples in the same way that judges decided the underlying cases. For each dependent variable, this was tested using a mixed-effects models to control for lack of independence in participants and cases, each of which was entered as a random effect.

Liability Decision. In the first model, Liability Decision was regressed on a Training factor (i.e., whether the participant was Not Trained, Trained on an Other Legal Category, or Trained on the Legal Category for the Case), the Legal Liability indicator code, a Transfer factor (i.e., No, Near, or Far Transfer), and an indicator code for the Indeterminacy of the legal rule (1 = Determinate), as well as the higher order interactions between these variables (Study 1: M1). Legal Liability, the two-way interaction between Legal Liability and Training, and the three-way interaction among these variables and Transfer were all highly significant predictors of Liability Decision. No other variable or interaction passed the conventional threshold for significance. Rerunning the model omitting the Indeterminacy factor (Study 1: M1a) did not substantively alter the results.

Table 9 provides the *F*-values for and coefficients for each factor and factor-level in Study 1: M1a, as well as their respective significance values.

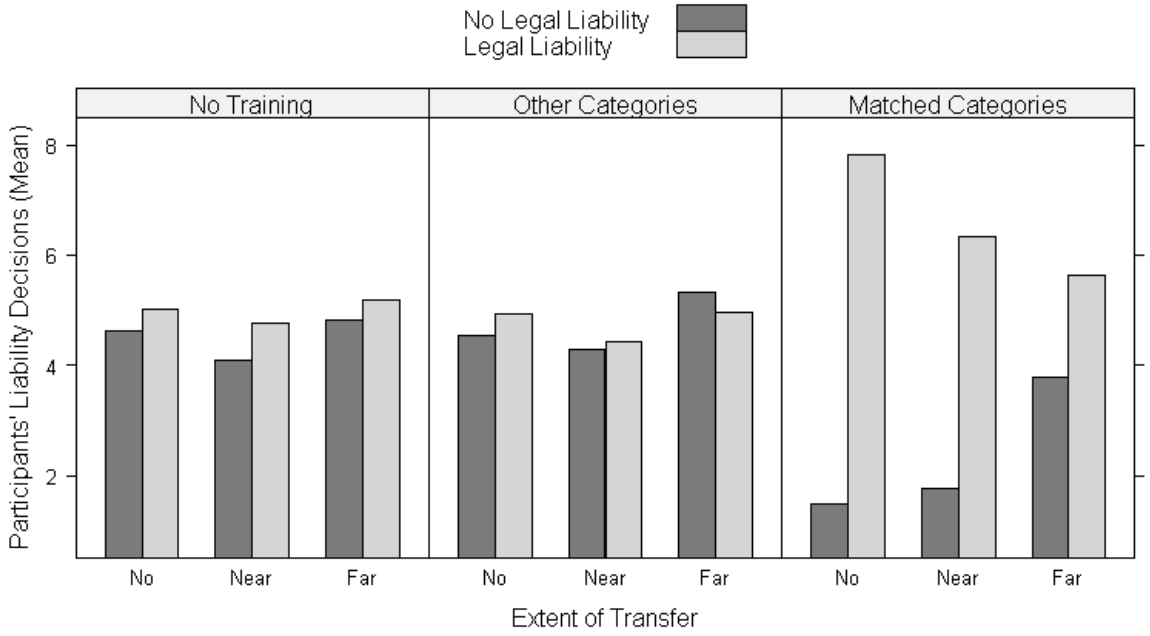
Table 9: Manipulation Check Test of Training for Study 1 - Liability Decisions						
	df	***F*-value**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				4.63	.55	<.001
Training: Other Legal Training (OTrg)	2	2.42	.090	-.09	.35	.798
Training: Matching Legal Category (MTrg)				-3.15	.35	<.001
Legal Liability (LL)	1	15.34	<.001	.37	.76	.627
Transfer: Near Transfer (NTrs)	2	.97	.379	-.54	.76	.478
Transfer: Far Transfer (FTrs)				.19	.76	.805
OTrg x LL	2	156.36	<.001	.02	.45	.958
MTrg x LL				5.96	.46	<.001
OTrg x NTrs	4	.39	.819	.28	.45	.545
MTrg x NTrs				.81	.46	.075
OTrg x FTrs				.59	.45	.198
MTrg x FTrs				2.11	.46	<.001
LL x NTrs	2	1.61	.201	.29	1.07	.784
LL x FTrs				-.01	1.07	.995
OTrg x LL x NTrs	4	13.98	<.001	-.54	.64	.398
MTrg x LL x NTrs				-2.06	.64	.001
OTrg x LL x FTrs				-.74	.64	.248
MTrg x LL x FTrs				-4.46	.64	<.001
Notes: Ps = 62, N = 1485						

As expected, Legal Liability influenced participants' Liability Decisions only when they had received training that matched the legal category that the court had used to decide the cases upon which the case examples were based. Moreover, the levels of the Transfer factor were also significant only in these circumstances. By contrast, there were no significant differences between the Liability Decisions of participants who had received

no training and lacked the $40 accuracy incentive and those of participants who were trained on non-matching legal categories and to whom the incentive was available.

Figure 5 illustrates the pattern of decisions. As shown in the right-most column, when participants decided case examples that matched the legal categories in their training, their Liability Decisions varied dramatically with the legal liability in the underlying cases. Moreover, the extent of Transfer moderated this effect. Participants were less able to apply the legal rules they learned to Far Transfer case examples (i.e., those that did not have surface features in common with the training cases) than with Near Transfer cases. By comparison, the middle column, depicting decisions of participants on case examples the legal category for which did not match their training, and left-most column, indicating decisions of participants in the no-training control condition, show no effect of Legal Liability or Transfer.

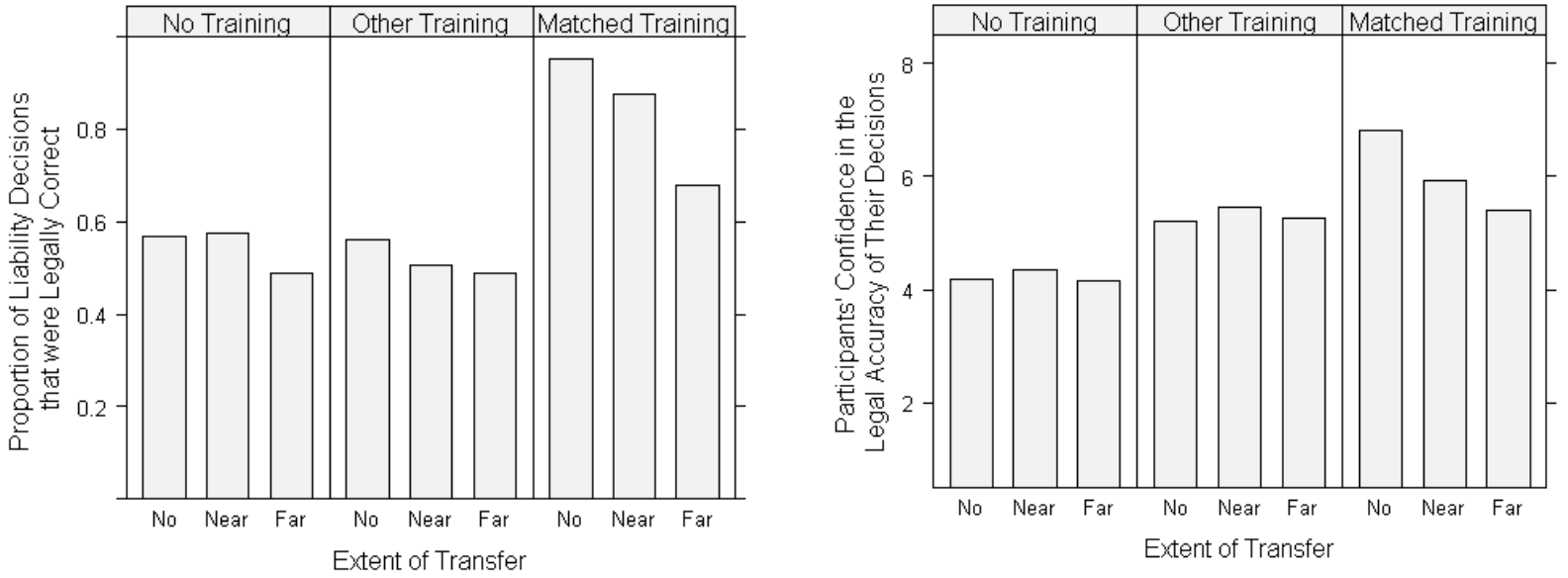
Figure 5: Effect of Training on Liability Decisions in Study 1



Legal Accuracy and Decision Confidence. The secondary dependent variables [i.e., Legal Accuracy (Study 1: M2) and Decision Confidence (Study 1: M3)] were then regressed separately on the predictors from Study 1: M1. (To account for the dichotomous Legal Accuracy dependent measure, a binomial probit mixed-effects general linear model was used for Study 1: M2.) In both models, only the Training factor and its interaction with Transfer were significant. Again, removing the other predictors from the model (Study 1: M2a and Study 1: M3a) did not substantively alter the results.

Figure 6 illustrates the results from Study 1: M2a and Study 1: M3a. Table 10 provides the *F*-values and coefficients for each factor and factor-level for these models, as well as their respective significance values. Training substantially increased Legal Accuracy in those case examples where the legal category matched the training; however, this effect was significantly attenuated in the Far Transfer Condition. By comparison, Training increased participants' confidence that their decisions were legally accurate irrespective of whether the legal category of a case example matched that in their training. In addition, participants were even more confidence of the legal accuracy of their decisions when their training matched the category of the case example, but only in the No Transfer and Near Transfer conditions. In terms of Decision Confidence, participants perceived Far Transfer cases that matched the legal category in their training as the equivalent of case examples from legal categories upon which they were not trained. Individual differences in Self Efficacy, Conscientiousness, Study Motivation, and Cognitive Ability did not moderate these effects.

Figure 6: Effect of Training on Legal Accuracy and Decision Confidence in Study 1



Notes: Given the study design, the expected proportion of Legally Correct decisions if participants are deciding either at random or using social categories is .5.

Table 10: Manipulation Check Test of Training for Study 1 - Legal Accuracy and Decision Confidence												
	Study 1: M2a (Legal Accuracy)						Study 1: M3a (Decision Confidence)					
	df	**Chi-Sq**	***p*-value**	**b**	**se**	***p*-value**	**df**	***F*-value**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				.20	.22	.376				4.18	.25	<.001
Training: Other Legal Training (OTrg)	2	161.58	<.001	-.03	.16	.842	2	70.45	<.001	1.02	.31	.001
Training: Matching Legal Category (MTrg)				1.63	.22	<.001				2.63	.31	<.001
Transfer: Near Transfer (NTrs)	2	2.38	.304	.02	.31	.946	2	13.27	<.001	.18	.13	.192
Transfer: Far Transfer (FTrs)				1.23	.31	.453				-.01	.13	.926
OTrg x NTrs	4	25.38	<.001	-.18	.21	.393	4	25.80	<.001	.08	.17	.640
MTrg x NTrs				-.43	.27	.113				-1.05	.17	<.001
OTrg x FTrs				.03	.20	.880				.09	.17	.606
MTrg x FTrs				-1.03	.26	<.001				-1.39	.17	<.001
Notes: Legal Accuracy: Ps = 62, N = 1485; Decision Confidence: Ps = 62, N = 1483												

In summary, in Study 1, participants with legal category training were able to apply their new knowledge to decide cases examples as the courts had, but only when the case examples were decided using a legal category that matched that used in their training. Training and financial incentive to be accurate notwithstanding, participants' decisions on cases, the legal category for which did not match their training were no more legally accurate than those with no training at all. Finally, participants with training were more confident in the accuracy of their decisions, even if the training did not fit the legal category of the case, but especially if it did.

Manipulation check: Social liability. Before testing the CCAM hypotheses about the extent to which participants might have been able to use their training in legal categories to avoid applying social categories, it is also necessary to verify in the Study 1 sample that Social Liability cues continued to have the expected effect. To test this, Pilot: M1 through Pilot: M4 were replicated using the responses from participants in the control condition in Study 1. The results of these analyses, shown in Table 11, are substantively identical to those for the selected case examples in the Pilot Study. In particular, the Social Liability indicator code was a highly significant predictor of RPW_{S1} (Study 1: M3). In addition, both the Social Liability indicator code (Study 1: M4) and RPW_{S1} (Study 1: M5) were highly significant positive predictors of Liability Decisions. Finally, neither the Legal Liability indicator code nor its interaction with RPW were significant (Study 1: M6). Thus, the social liability cues embedded in the case examples continued to function as expected in Study 1.

Table 11: Manipulation Check Tests of Social Liability and Relative Party Warmth in Study 1												
	Study 1: M3 (RPW_{S1})						**Study 1: M4 (Liability Decision)**					
	df	***F*-value**	***p*-value**	**b**	**se**	***p*-value**	**df**	***F*-value**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				-.14	.24	.551				4.17	.25	<.001
Social Liability	1	11.21	<.001	.94	.28	<.001	1	16.65	<.001	1.17	.29	<.001
	Ps = 20, N = 478						Ps = 20, N = 480					
	Study 1: M5 (Liability Decision)						**Study 1: M6 (Liability Decision)**					
	df	**i-value**	***p*-value**	**b**	**se**	***p*-value**	**df**	***F*-value**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				4.61	.20	<.001				4.26	.23	<.001
RPW_{S1}	1	126.84	<.001	.45	.04	<.001	1	129.91	<.001	.49	.05	<.001
Legal Liability (LL)	NA						1	5.86	.016	.68	.27	.012
RPW_{S1} x LL							1	1.54	.215	-.09	.08	.215
	Ps = 20, N = 478											

Primary analysis: Liability decisions. Recall that H1, the true null, is that participants with training in legal categories will use social categories to the same extent as those without training. In addition, H2, H3, and H4 are that legal category training would attenuate participants' use of social categories to a greater or lesser amount depending upon the extent of Transfer; H2 stating that Transfer would have a substantial impact, H3 some impact, and H4 no impact on the extent to which participants who had learned legal categories avoided using social categories. Finally, Hypothesis 5 states that Legal Category Indeterminacy would moderate the extent to which the effects of training are robust to Transfer.

In terms of the variables, the hypotheses led to the following predictions:

- H1: RPW_{BL} would predict participants' Liability Decisions, irrespective of Training, Transfer, or Indeterminacy (i.e., significant main effect for RPW_{BL}; no higher-order interactions);
- H2: RPW_{BL} would predict participants' Liability Decisions in the No Training Condition and Near and Far Transfer levels of the Matched Training condition (i.e., significant three-way interaction among RPW_{BL}, Training, and Transfer; no higher-order interaction with Indeterminacy);
- H3: RPW_{BL} would predict participants' Liability Decisions in the No Training Condition and Far Transfer level of the Matched Training condition (i.e., significant three-way interaction among RPW_{BL}, Training, and Transfer; no higher-order interaction with Indeterminacy);

- H4: RPW_{BL} would predict participants' Liability Decisions in the No Training Condition but not the Matched Training condition (i.e., significant two-way interaction between RPW_{BL} and Training; no higher-order interaction with Transfer or Indeterminacy);
- Hypothesis 5: If H2, H3, or H4, holds for the Determinate Legal Category Cases, then H1, H2, or H3, respectively, would hold for the Indeterminate Legal Category Cases (i.e., significant four-way interaction among RPW_{BL}, Training, Transfer, and Indeterminacy).

To test the hypotheses, using a mixed effects model with participants and Cases as random variables, Liability Decision was regressed on the four predictors and their higher-order interactions (Study 1: M7).

Table 12 provides the *F*-values for each factor in Study 1: M7, as well as their respective significance values. Figure 7 illustrates the relationship between RPW_{PBL} and Liability Decisions across the factor-level combinations. Consistent with the results of the training manipulation check, Figure 7 suggests that there is little or no difference in the judgments of participants who received no training (No Training) and those of participants who were deciding cases, the legal category for which was not included in their training (Other Training). To test whether the difference was significant, Study 1: M7 was rerun with the 3-level Training Factor replaced with a 2-level factor for whether the legal categories included in a participants' training matched that of the case they were deciding (Study 1: M7a). This effectively collapsed decisions from participants in the

No-Training Control condition with those of participants whose training did not match the case being decided.

Figure 7: Study 1 Full Factorial Model – Liability Decisions

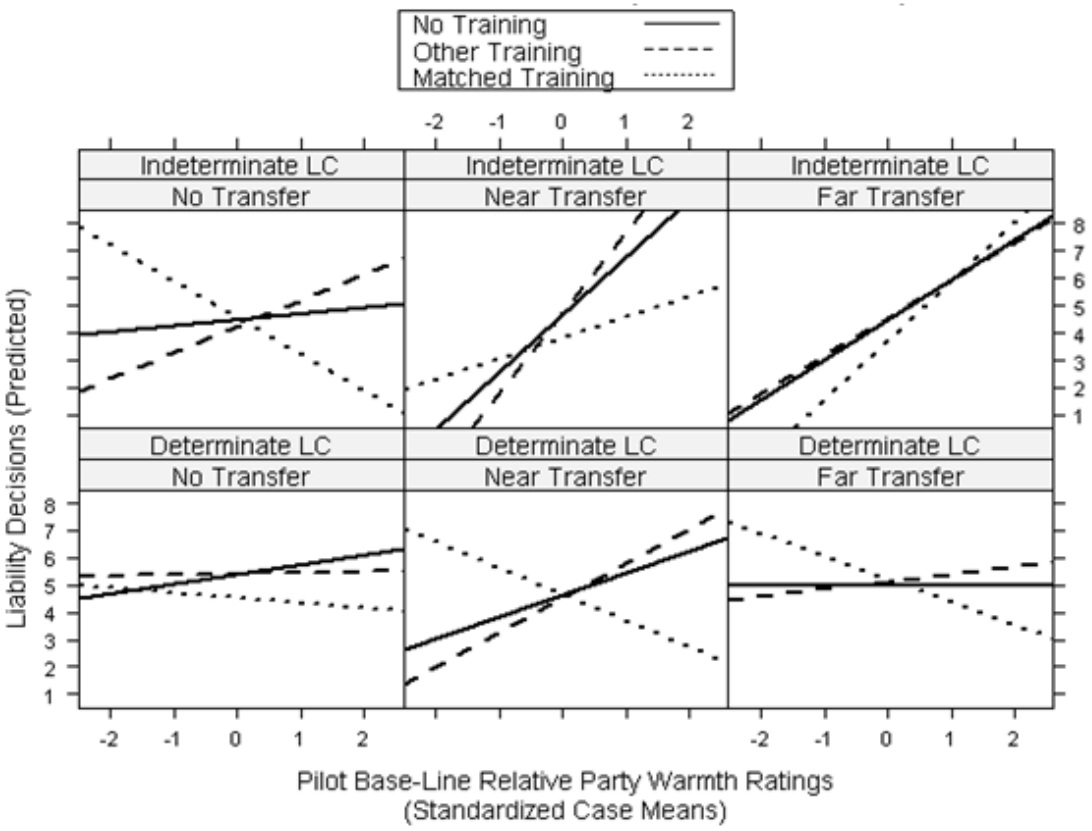


Table 12 provides the *F*-values for each factor in Study 1: M7a, as well as their respective significance values. A comparison of the fit of Model 1: M7 and Model 1: M7a indicates that although Study 1: M7 requires 12 more parameters to be estimated, the two are not significantly different (See Table 12).[19] Thus, following the principle of parsimony, given that distinguishing between the No Training and Other Training levels

[19] When Study 1: M7 was rerun omitting Matched-Training Decisions as a direct test of whether there were any significant differences between the effects of RPW_{PBL} on decisions of participants in the No-Training and Other-Training conditions, neither the Training x RPW_{PBL} factor nor any of the higher order interactions between it and the other factors are significant (all *p*s > .166).

of the Training factor has no explanatory value, in the remaining analysis in Study 1 the two levels were collapsed into one level.

Table 12: Comparison of Two Full-Factor Models of Effects of Training on Liability Decisions in Study 1

	Study 1: M7 (3-Level Training Factor)			Study 1: M7a (2-Level Training Factor)		
Predictor / Factors (Computation / Levels)	**df**	***F*-value**	***p*-value**	**df**	***F*-value**	***p*-value**
RPW_{PBL}	1	.87	.351	1	.87	.351
Training (Trg)	2	2.07	.127	1	4.15	.042
Transfer (Trs)	2	.42	.660	2	.42	.660
Legal Category Indeterminacy (LCI)	1	.82	.366	1	.82	.366
RPW_{PBL} x Trg	2	14.18	<.001	1	28.01	<.001
RPW_{PBL} x Trs	2	.31	.736	2	.31	.736
Trg x Trs	4	.32	.864	2	.50	.608
RPW_{PBL} x LCI	1	1.96	.161	1	1.96	.161
Trg x LCI	2	.62	.539	1	.35	.552
Trs x LCI	2	.02	.983	2	.02	.983
RPW_{PBL} x Trg x Trs	4	2.61	.034	2	4.30	.014
RPW_{PBL} x Trg x LCI	2	.40	.670	1	.02	.902
RPW_{PBL} x Trs x LCI	2	.81	.443	2	.81	.443
Trg x Trs X LCI	4	4.22	.002	2	8.02	<.001
RPW_{PBL} x Trg x Trs x LCI	4	6.62	<.001	2	11.66	<.001

Model Fit

Model	**df**	**AIC**	**BIC**	**Log Likelihood**	**Chi-Squared**	**df**	***p*-value**
Study 1: M7	39	6798.3	7005.1	-3360.1			
Study 1: M7a	27	6782.8	6926.0	-3364.4	8.50	12	.745

Notes: Ps = 62, N = 1485.

Focusing on the levels and interactions of interest in Study 1: M7a, the results of the analysis support Hypothesis 5. In particular, the main effect for RPW_{PBL} was not significant; however, the interaction between RPW_{PBL} and Training was highly significant. Further, the interaction was qualified by significant interactions with Transfer alone and a highly significant interaction with Transfer and Legal Category Indeterminacy. Regression coefficients for the full model and simple-slopes subset models are given in Table 13.

Table 13: Coefficients and Simple Slopes for Effects of Factors on Liability Decisions in Study 1

Predictor / Factor Levels	b	se	*p*-value
(Intercept)	5.39	.78	<.001
RPW_{PBL}	.20	.51	.702
MTrg	-.86	.34	.013
NTrs	-.85	1.16	.431
FTrs	-.33	1.10	.764
LCI	-1.00	1.08	.353
RPW_{PBL} x MTrg	-.38	.45	.074
RPW_{PBL} x NTrs	.84	2.11	.445
RPW_{PBL} x FTrs	-.06	1.4	.939
MTrg x NTrs	1.01	.49	.025
MTrg x FTrs	1.04	.46	.022
RPW_{PBL} x LCI	.40	1.17	.731
MTrg x LCI	.95	.50	.056
NTrs x LCI	1.17	1.58	.460
FTrs x LCI	.43	1.54	.779
RPW_{PBL} x MTrg x NTrs	-1.61	.89	<.001
RPW_{PBL} x MTrg x FTrs	-.60	.59	.072
RPW_{PBL} x MTrg x LCI	-1.54	.49	.002
RPW_{PBL} x NTrs x LCI	1.09	2.38	.645
RPW_{PBL} x FTrs x LCI	.89	1.61	.579
MTrg x NTrs x LCI	-2.01	.67	.003
MTrg x FTrs x LCI	-1.92	.65	.003
RPW_{PBL} x MTrg x NTrs x LCI	1.77	1.00	.076
RPW_{PBL} x MTrg x FTrs x LCI	3.27	0.68	<.001

Notes: Ps = 62, N = 1485. Underlines in the simple slopes analysis indicate that the intercept was also significant.

Predictor / Factor Levels	Indeterminate Category			Determinate Category		
	b	se	*p*-value	b	se	*p*-value
(Intercept)	4.37	.77	<.001	5.41	.76	<.001
RPW_{PBL}	.60	1.08	.510	.20	.50	.637
MTrg	.14	.35	.711	-.91	.34	.007
NTrs	.32	1.19	.728	-.85	1.05	.370
FTrs	.11	1.12	.906	-.33	1.06	.725
RPW_{PBL} x MTrg	-1.93	.43	<.001	-.38	.22	.084
RPW_{PBL} x NTrs	1.94	2.16	.279	.84	1.07	.377
RPW_{PBL} x FTrs	.83	1.43	.490	-.06	.77	.919
MTrg x NTrs	-.99	.47	.041	1.02	.47	.032
MTrg x FTrs	-.87	.45	.061	1.04	.47	.028
RPW_{PBL} x MTrg x NTrs	.16	.86	.858	-1.61	.48	.001
RPW_{PBL} x MTrg x FTrs	2.67	.57	<.001	-.60	.34	.083
	Simple Slopes: Transfer			**Simple Slopes: Transfer**		
Training Condition	**NoTrs**	**NTrs**	**FTrs**	**NoTrs**	**NTrs**	**FTrs**
	b	**b**	**b**	**b**	**b**	**b**
(Intercept)	4.37^{***}	4.70^{***}	4.48^{***}	5.41^{***}	4.56^{**}	5.08^{***}
RPW_{PBL}	.60	2.53	1.43^{***}	.20	1.04	.13
MTrg	.13	$-.85^{*}$	$-.73^{*}$	$-.91^{**}$	.11	.14
RPW_{PBL} x MTrg	-1.93^{***}	-1.76^{*}	$.75^{*}$	-.38+	-1.99^{***}	$-.98^{***}$
	Simple Slopes: MTrg | Trs			**Simple Slopes: MTrg | Trs**		
	b	**b**	**b**	**b**	**b**	**b**
RPW_{PBL} | Not MTrg	<u>.60</u>	<u>2.53</u>	<u>1.43^{*}</u>	<u>.20</u>	<u>1.04</u>	<u>.13</u>
RPW_{PBL} | M Trg	<u>-1.30</u>	<u>.77</u>	<u>2.17^{*}</u>	<u>-.19</u>	<u>-.96</u>	<u>-.85</u>

Follow-up analysis of simple slopes collapsing across nonsignificant factor levels indicates that RPW_{PBL} *was* a positive predictor of the Liability Decisions of participants who received no training or who were deciding cases that did not match the legal categories they learned (b = .49, se = .17, p = .005).[20] By comparison, RPW_{PBL} was *not* a predictor of Liability Decisions of participants who were trained in the Determinate Legal Categories on matching cases, irrespective of the level of Transfer (b = -.45, se = .60, p = .448).[21] For participants who were trained in the Indeterminate Legal Category and who were deciding a case example that matched that category, whether RPW_{PBL} was a positive predictor of Liability Decisions depended on the extent of Transfer. Specifically, RPW_{PBL} was not a positive predictor of Liability Decisions in the No Transfer condition (b = -1.30, se = 3.25, p = .689), but was a (non-significant) positive predictor in the Near Transfer condition (b =.77, se = 4.50, p = .865) as well as a significant positive predictor in the Far Transfer condition (b =2.17, se = .53, p < .001).

Secondary analysis: Legal accuracy and decision confidence

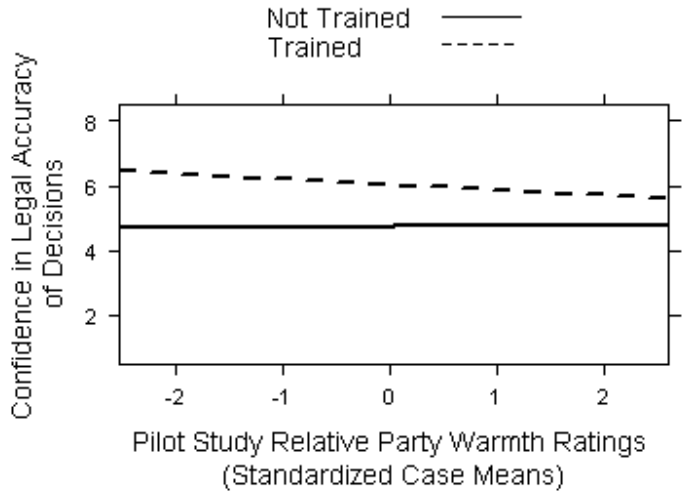
With respect to the secondary dependent measures, using binomial-probit and linear mixed effects models, respectively, Legal Accuracy and Decision Confidence were each regressed on RPW_{PBL}, Training, Transfer, and Legal Category Indeterminacy, as well as the higher-order interactions between them. For Legal Accuracy, only Training, Transfer, and the Training x Transfer interaction were significant predictors. Removing the non-significant variables, the results are thus the same as those reported for the

[20] The interaction among RPW_{PBL}, Transfer, Indeterminacy, and the higher-order interactions between them were nonsignificant and thus omitted from the model.

[21] The interaction between RPW_{PBL} and Transfer was nonsignificant and thus omitted from the model.

Table 14: Effects of Relative Party Warmth and Training on Decision Confidence in Study 1

Predictor / Factors (Computation / Levels)	***F*-value**	***p*-value**
RPW_{PBL}	.55	.460
MTrg	118.58	<.001
RPW_{PBL} x MTrg	9.77	.002



Predictors / Factor Level	**Study 1: M9** (DV: Decision Confidence)		
	b	**se**	***p*-value**
(Intercept)	4.94	.2416	<.001
RPW_{PBL}	.03	.06	.633
MTrg	.77	.07	<.001
RPW_{PBL} x MTrg	-.20	.06	.002

	Simple Slopes	
Training Condition	NoTrg	MTrg
(Intercept)	4.94^{***}	6.05^{***}
RPW_{PBL}	.03	-.17

Notes: Ps = 62, N = 1485.

Training Manipulation Check, described in the previous section. By comparison, Training and the RPW_{PBL} x Training interaction were both significant predictors of Decision Confidence (see Table 14). In particular, participants with Training that matched the case they were deciding were significantly more confident that their decisions were legally accurate than those without training or whose training did not match the cases being decided. However, confidence was attenuated to the extent that RPW_{PBL} increased.

Study 1 discussion

The primary goal of Study 1 was to provide an initial test of the CCAM hypotheses under the most basic training conditions, those under which participants needed to learn and apply only one set of situation categories. The results provide strong support for Hypothesis 5. In particular, in making their decisions, participants who were untrained or whose training did not match the case being decided relied upon stereotypic associations between the social categories of the parties in the examples and the trait of warmth. However, when deciding cases that corresponded to the legal categories included in their training, participants who had been trained were able to avoid doing so. Thus, the true null hypothesis (H1) that training would have no effect on use of social categories should be rejected.

As expected, the overall result was qualified by the indeterminacy of the relevant situation category. Participants who were trained in Negligence law, the Indeterminate Legal Category, and who were deciding cases that matched the categories were only able to avoid relying on the stereotypic associations for cases that they saw in training (i.e., No

Transfer) or that shared surface features with them (i.e., Near Transfer). This conforms to the mean forms of CCAM, and thus H3, when the situation categories learned are indeterminate. By comparison, participants in Study 1 who were trained in Determinate Legal Categories and who were deciding cases that matched those categories were able to avoid relying on the stereotypic associations *irrespective of the level of transfer for the cases*. This is evidence for the strong limit of CCAM (and H4) when situation categories are determinate.

Setting aside the psychological effects, what is the effect size of the results in Study 1 in terms of bias and bias reduction of the outcome of the Liability Decisions? To answer the question, participants' Liability Decisions were transformed into indicator codes for whether they were consistent with the use of social stereotypes (1 = consistent, 0 = inconsistent). In particular, the RPW_{PBL} ratings for each case and Liability Decisions of each participant for each case were dichotomized using a median split and mid-point of the scale, respectively. The transformed scores were then compared and recoded such that matching scores (i.e., $RPW_{PBL} = 0$ and Liability Decisions = 0 or $RPW_{PBL} = 1$ and Liability Decisions = 1) were coded as 1 and mismatched scores (i.e., $RPW_{PBL} = 1$ and Liability Decisions = 0 or $RPW_{PBL} = 0$ and Liability Decisions = 1) coded as 0. The indicator code was then used to compute the odds that the decisions in each of the major conditions of interest were consistent with the use of social stereotypes. Given the balanced design, an odds of 1 indicates that liability decisions did not favor the party from the warmer social category.

Table 15 provides the odds, as well as the odds ratios between them. As a baseline, for participants in the control condition or whose training did not match the case being decided, the odds that a Liability Decision was consistent with the use of social stereotypes was 1.57, or just over 3-to-2. In the Determinate Legal Category and Indeterminate Legal Category x No Transfer conditions, by comparison, the odds approached 1 (i.e., .84, or 21-to-24, and .98, or 49-to-50, respectively).

Table 15: Study 1 Liability Effect Sizes

	NoTrg	**Trg LCD**	**Trg LCI NoTrs**	**Trg LCI NrTrs**	**Trg LCI FTrs**
Odds of Liability Decision Conforming to RPW_{BL} Prediction	1.57	.84	.98	.68	3.42
	Odds Ratios				
NoTrg	1	1.87	1.61	2.31	.71
Trg LCD	.53	1	.86	1.23	.38
Trg LCI NoTrs	.62	1.16	1	1.43	.44
Trg LCI NrTrs	.43	.81	.70	1	.31
Trg LCI FTrs	1.41	2.63	2.26	3.25	1

Notes: Odds ratios above the diagonal are vertically listed conditions/horizontally listed conditions with; odds ratios below the diagonal reflect the inverse pattern.

Most strikingly, however, the highest odds of stereotypes influencing participants' decisions was in the Indeterminate Legal Category x Far Transfer condition: 3.42, or just under 7-to-2. As the odds ratios indicate, this is substantially higher than in the control condition, a result suggesting that individuals who have received training that does not effectively reduce the ambiguity of a situation are the most prone to stereotype use.

Study 2

Overview and Design. Study 2 is a replication of Study 1 in all respects but one: Participants either received no training in any of the legal categories or training in all of them. Accordingly, it extends the first study by requiring participants to retain more

information and testing the effects of Legal Category Indeterminacy as a within-participants factor. It follows a 2 (Training: Yes, No) X 2 (RPW_{BL} Advantage: Plaintiff, Defendant) X 2 (Legal Category Liability: Yes, No) X 2 (Legal Category Indeterminacy: Determinate, Indeterminate) X 3 (Transfer: No, Near, Far) mixed factorial design. Of these, training is a between-participants variable, whereas the remainder are manipulated within participants. Table 16 depicts the design.

Table 16: Design for Study 2

Social Category Response	Legal Category Response	Legal Category Indeterminacy	Transfer	**Training**	**No Training**
Liability	Liability	Low	No	58	407
			Near	58	
			Far	58	
		High	No	58	
			Near	58	
			Far	58	
	No Liability	Low	No	57	
			Near	59	
			Far	58	
		High	No	59	
			Near	57	
			Far	58	
No Liability	Liability	Low	No	58	409
			Near	58	
			Far	58	
		High	No	58	
			Near	57	
			Far	58	
	No Liability	Low	No	58	
			Near	58	
			Far	58	
		High	No	58	
			Near	58	
			Far	57	

Note: Between-participants factor levels are in bold. Cell values indicate the number of decisions in the cell in the Study 2 sample.

Dependent measures are Liability Decision, Legal Accuracy, and Decision Confidence.

All participants were randomly assigned to a training or no-training condition. All training-condition participants completed training on all three of the tort categories.

Participants. Participants for Study 1 (N = 93) were recruited from the University of Minnesota Psychology REP pool and awarded extra-credit in a psychology course for their participation. As is Study 1, 10 participants also received $40 as part of an incentive to pay attention to and apply the training. Participant ages ranged from 17 to 34 (MDN = 19); 57% were female; 76% self-identified as white, 13% Asian, 4% black, 4% Hispanic, and 1% other; and 88% were native English speakers. Further, participants had completed 0 to 11 semesters of college (MDN = 1) and their College GPAs, where available, ranged from 2.0 to 3.9 (MDN = 3.3).

Materials. The materials for Study 2 were the same as those used in Study 1 except that the separate training PowerPoint slides for the indeterminate and determinate legal rules were combined into one set of training slides.

Procedure. The procedure for Study 2 was the same as that for Study 1 with the exception of the training and computation of RPW_{BL}. All participants in the training condition completed a guided analogical coding training on PowerPoint that covered each of the tort categories. To incorporate the additional information available, RPW_{BL} was computed using the grand-mean of the RPW ratings of untrained participants in the Pilot Study and Study 1.

Results

Data preparation. Prior to analysis, scores were computed for each scale and its reliability computed and recorded. Table 17 lists the reliability (where applicable), mean,

Table 17: Descriptive Statistics and Zero Order Correlations for Measured Variables in Study 2

	PW	PC	DW	DC	SE	C	SM	MCP	EMCP	IMCP	RWA	SDO	CA	LD	LA	Cf
Plaintiff Warmth (PW) (α=.94, M=5.5, SD=1.9)	X	2182	2179	2178	2116	2068	2116	2167	2187	2187	2045	2068	2019	2186	2186	2178
Plaintiff Competence (PC) (α=.93, M =5.9, SD =1.9)	**.74**	X	2181	2181	2118	2070	2118	2169	2189	2189	2045	2070	2021	2188	2188	2180
Defendant Warmth (DW) (α=.91, M =5.4, SD =1.8)	**.29**	**.28**	X	2181	2116	2067	2116	2167	2187	2187	2044	2069	2020	2186	2186	2178
Defendant Competence (DC) (α=.90, M =5.4, SD =1.9)	**.28**	**.28**	**.71**	X	2115	2066	2115	2166	2186	2186	2042	2068	2019	2185	2185	2177
Self Efficacy (SE) (α=.89, M =5.6, SD =.9)	-.05	-.03	-.01	**-.07**	X	86	88	90	89	90	84	86	83	2124	2124	2116
Contentiousness (C) (α=.73, M =4.9, SD =1.1)	**.14**	**.12**	**.08**	.02	.32	X	86	88	87	88	82	83	81	2075	2075	2067
Study Motivation (SM) (α=.79, M =4.5, SD =1.0)	**.08**	**.08**	**.10**	**.10**	.04	.30	X	90	89	90	84	85	83	2124	2124	2116
Motivation to Control Prejudice (MCP) (α=.80, M =4.1, SD =.8)	**.18**	**.16**	**.12**	**.11**	-.12	.23	.25	X	92	93	87	88	86	2175	2175	2167
External (EMCP) (α=.83, M =4.3, SD =1.0)	-.01	.00	-.02	-.04	-.01	**.39**	.32	**.51**	X	92	86	87	85	2195	2195	2187
Internal (IMCP) (α=.52, M =3.8, sd=.8)	.01	.02	-.01	-.02	-.29	.14	.23	**.40**	**.34**	X	87	88	86	2195	2195	2187
Right Wing Authoritarianism (RWA) (α=.75, M =4.1, SD =.8)	-.02	-.01	-.03	-.02	.12	-.16	.13	-.09	-.19	.01	X	82	80	2051	2051	2045
Social Dominance Orientation (SDO) (α=.93, M =2.8, SD =1.2)	**-.16**	**-.14**	-.03	-.05	.05	-.24	-.11	-.29	**-.48**	-.17	**.37**	X	82	2076	2076	2069
Cognitive Ability (CA) (M =26.9, SD =3.1)	-.02	-.08	-.01	-.05	-.01	-.14	-.09	-.09	.02	-.23	-.15	.07	X	2027	2027	2021
Liability Decision (LD) (M =4.7, SD =2.8)	**.22**	**.27**	**-.15**	**-.16**	.01	-.01	-.03	-.02	.01	-.01	0	-.04	.01	X	2195	2187
Legally Accurate (LA) (M =.7, s SD =.5)	.01	-.03	.06	.05	-.02	.01	.03	-.02	-.04	-.04	.01	.05	.01	-.03	X	2187
Confidence (Cf) (M =5.5, s SD =1.5)	**.12**	.07	.06	.01	**.09**	**.11**	.02	**-.08**	0	0	.05	.05	-.01	.04	**.24**	X

Notes: Values above and below the diagonal are sample sizes and correlation coefficients, respectively. All bolded coefficients were statistically significant at p < .05, after adjusting for multiple tests. P-values are not adjusted for the lack of independence between raters or in the underlying cases.

and standard deviations for all of the measured variables in Study 2, as well as the zero-order correlations between them. Consistent with the results of the Pilot Study and Study 1, inter-party ratings of warmth and competence were highly positively correlated. In addition, ratings of Plaintiffs' warmth and competence were significantly positively correlated with Liability Decisions, whereas the opposite was true of ratings for Defendants. Again, none of the zero-order correlations between individual differences and Liability Decisions were significant.

Baseline Relative Party Warmth. To take advantage of the additional information about the socially-shared perceptions of the litigants gathered in Study 1, RPW_{PBL} ratings were averaged with the mean RPW ratings for each case by participants no-training control group in Study 1 to produce a new Base-Line Relative Party Warmth (RPW_{P1BL}) predictor for Study 2. As indicated in Table 8 (p. 99), the Pilot Study and Study 1 RPW ratings for the cases were highly correlated (r = .77), suggesting that relative stereotypic perceptions of the warmth of the plaintiffs and defendants were very stable.

Manipulation check: Training. Unlike Study 1, participants in Study 2 who received training were exposed to, and required to remember rules for, all three legal categories. As with Study 1, a preliminary question in Study 2 is thus whether, irrespective of social category use, participants were able to retain this training and apply it to their decisions at all. Again their ability to do so was assessed with respect to each of the dependent variables.

Liability Decision. In the first model, Liability Decision was regressed on a Training factor (i.e., Not Trained or Trained), the Legal Liability indicator code, the Transfer factor, and the indicator code for the Indeterminacy of the legal rule, as well as the higher order interactions between these variables (Study 2: M1). Legal Liability, the two-way interaction between Legal Liability and Training, and the three-way interaction between these variables and Transfer were all highly significant predictors of Liability Decision. No other variable or interaction passed the conventional threshold for significance. Rerunning the model omitting the Indeterminacy factor (Study 2: M1a) did not substantively alter the results.

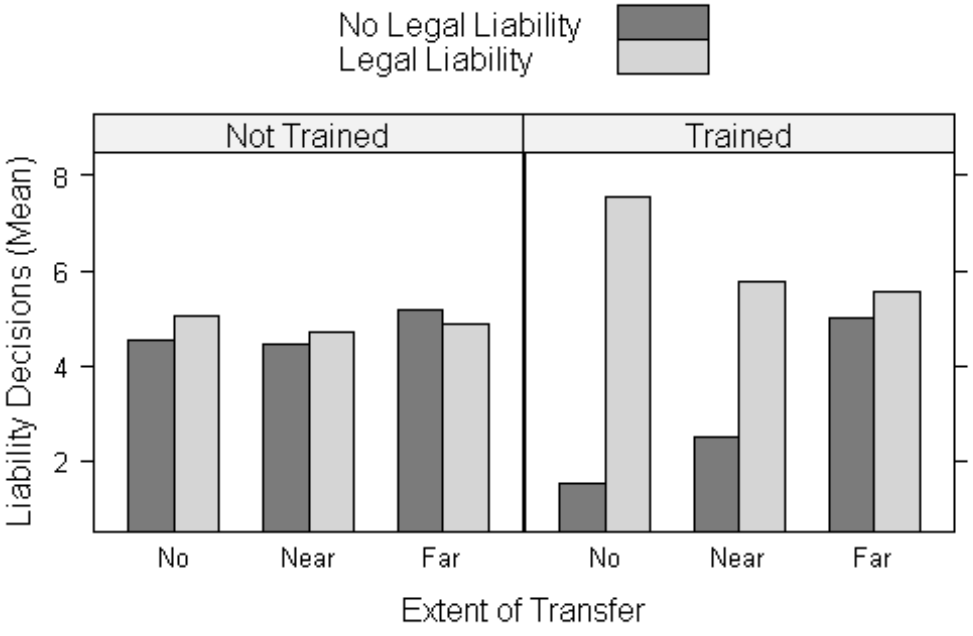
Table 18 provides the *F*-values and coefficients for each factor and factor-level in Study 2: M1a, as well as their respective significance values. An illustration of the effect is shown in Figure 8a. Legal Liability influenced participants' Liability Decisions only

Table 18: Manipulation Check Test of Training for Study 2 - Liability Decisions

	df	*F*-value	*p*-value	b	se	*p*-value
(Intercept)				4.54	.47	<.001
Training: Matching Legal Category (MTrg)	1	1.62	.203	-3.03	.24	<.001
Legal Liability (LL)	1	33.87	<.001	.52	.66	.430
Transfer: Near Transfer (NTrs)	2	2.01	.134	-.07	.66	.913
Transfer: Far Transfer (FTrs)				.64	.66	.334
MTrg x LL	1	297.26	<.001	5.53	.31	<.001
MTrg x NTrs	2	5.47	.004	1.08	.31	<.001
MTrg x FTrs				2.85	.31	<.001
LL x NTrs	2	8.75	<.001	-.27	.94	.772
LL x FTrs				-.81	.94	.388
MTrg x LL x NTrs	2	55.68	<.001	-2.56	.44	<.001
MTrg x LL x FTrs				-4.67	.44	<.001
Notes: Ps = 93, N = 2195						

when they had received training. Moreover, the levels of the Transfer factor were also significant only in these circumstances. In particular, the decisions of trained participants, depicted in the right cell of the illustration, conformed substantially to the Legal Liability in the underlying cases. Moreover, the extent of Transfer moderated this effect. Participants were less able to apply the legal rules they learned to Far Transfer case examples (i.e., those that did not have surface features in common with the training cases) than with Near Transfer cases. By comparison, the Liability Decisions of participants who were not trained show no effect of Legal Liability or Transfer.

Figure 8a: Effects of Training on Liability Decisions in Study 2



Legal Accuracy and Decision Confidence. The secondary dependent variables [i.e., Legal Accuracy (Study 2: M2) and Decision Confidence (Study 2: M3)] were then regressed separately on the predictors from Study 2: M1. (As in Study 1, a binomial probit mixed-effects general linear model was used to account for the dichotomous Legal

Accuracy dependent measure for Study 2: M2.) In both models, only the Training factor and its interaction with Transfer were significant. Again, removing the other predictors from the model (Study 2: M2a and Study 2: M3a, respectively) did not substantively alter the results.

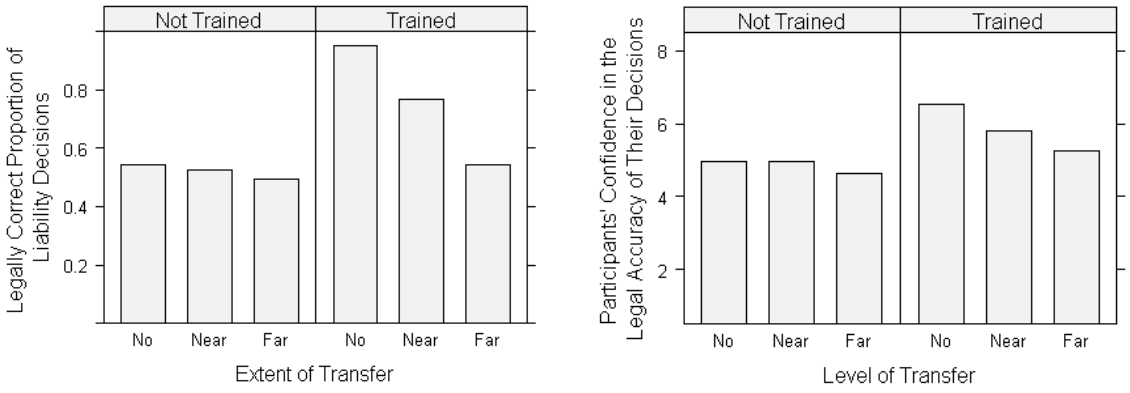
Table 19 provides the *F*-values and coefficients for each factor and factor-level for these models and their respective significance values. Overall, training substantially increased Legal Accuracy; however, this effect was significantly attenuated in the Near- and Far Transfer Conditions. Similarly, participants with training were more confident in the legal accuracy of their decisions, an effect that was also significantly reduced in the Near and Far Transfer conditions. Thus, notwithstanding receiving training on additional legal categories, as with Study 1, participants in Study 2 with legal category

Table 19: Manipulation Check Test of Training for Study 1 - Legal Accuracy and Decision Confidence						
	Study 2: M2a (Legal Accuracy)					
	df	**Chi-Sq**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				.13	.20	.521
Trg	1	66.01	<.001	1.72	.15	<.001
NTrs	2	10.15	.006	-.07	.28	.806
FTrs				-.15	.28	.597
Trg x NTrs	2	91.69	<.001	-.93	.17	<.001
Trg x FTrs				-1.58	.17	<.001
	Study 2: M3a (Decision Confidence)					
	df	***F*-value**	**p-value**	**b**	**se**	***p*-value**
(Intercept)				4.96	.17	<.001
Trg	1	28.83	<.001	1.55	.20	<.001
NTrs	2	37.16	<.001	-.03	.12	.868
FTrs				-.33	.13	.017
Trg x NTrs	2	33.96	<.001	-.73	.12	<.001
Trg x FTrs				-.95	.12	<.001
Notes: LC: Ps = 93, N = 2195; DC: Ps = 93, N = 2187						

training were able to apply it to decide cases examples as the courts had, and were more confident in the ability to do so. However, these effects were reduced in decisions on Near Transfer cases and eliminated entirely in No Transfer cases.

Figure 8b illustrates the effects in Study 2: M2a and Study 2: M3.

Figure 8b: Effects of Training on Legal Accuracy and Decision Confidence in Study 2



Manipulation Check: Social Liability. To assess whether Social Liability cues continued to have the expected effect in the Study 2 sample, Pilot: M1 through Pilot: M4 were rerun using the responses from participants in the No-Training control condition in Study 2. The results of these analyses, shown in Table 20, replicate those in the Pilot Study and Study 1. In particular, the Social Liability indicator code was a highly significant predictor of RPW_{S2} (Study 2: M3). In addition, both the Social Liability indicator code (Study 2: M4) and RPW_{S2} (Study 2: M5) were highly significant positive predictors of Liability Decisions. Finally, neither the Legal Liability indicator code nor its interaction with RPW_{S2} were significant (Study 2: M6). Thus, the social liability cues embedded in the case examples continued to function as predicted.

Table 20: Manipulation Check Tests of Social Liability and Relative Party Warmth in Study 2												
	Study 2: M3 (RPW_{S2})						**Study 2: M4 (Liability Decision)**					
	df	***F*-value**	***p*-value**	**b**	**se**	***p*-value**	**df**	***F*-value**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				-.51	.25	.050				4.13	.20	<.001
Social Liability	1	13.83	<.001	1.20	.32	<.001	1	29.24	<.001	1.36	.25	<.001
	Ps = 34, N = 800						Ps = 34, N = 811					
	Study 2: M5 (Liability Decision)						**Study 2: M6 (Liability Decision)**					
	df	***F* -value**	***p*-value**	**b**	**se**	***p*-value**	**df**	***F*-value**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				4.77	.17	<.001				4.54	.22	<.001
RPW_{S2}	1	160.25	<.001	.37	.03	<.001	1	161.39	<.001	.40	.04	<.001
Legal Liability (LL)	NA						1	2.44	.118	.45	.28	.110
RPW_{S2} x LL							1	.64	.423	-.05	.06	.418
	Ps = 34, N = 800						Ps = 34, N = 800					

Primary Analysis: Liability Decisions. To test the hypotheses in Study 2, using a mixed effects model with participants and cases as random variables, Liability Decision was regressed on the four predictors (i.e., $PRW_{P1BL,}$ Training, Transfer, and Legal Category Indeterminacy) and their higher-order interactions (Study 2: M7). Figure 9 illustrates the relationship between RPW_{P1BL} and Liability Decisions across the factor-level combinations in the full model for participants who were trained and not trained. Table 21 provides the *F*-values for each factor in Study 2: M7, as well as their respective significance values; regression coefficients for the full model and simple-slopes subset models are given in Table 22. Again, the results support Hypothesis 5.

Figure 9: Study 2 Full Factorial Model – Liability Decisions

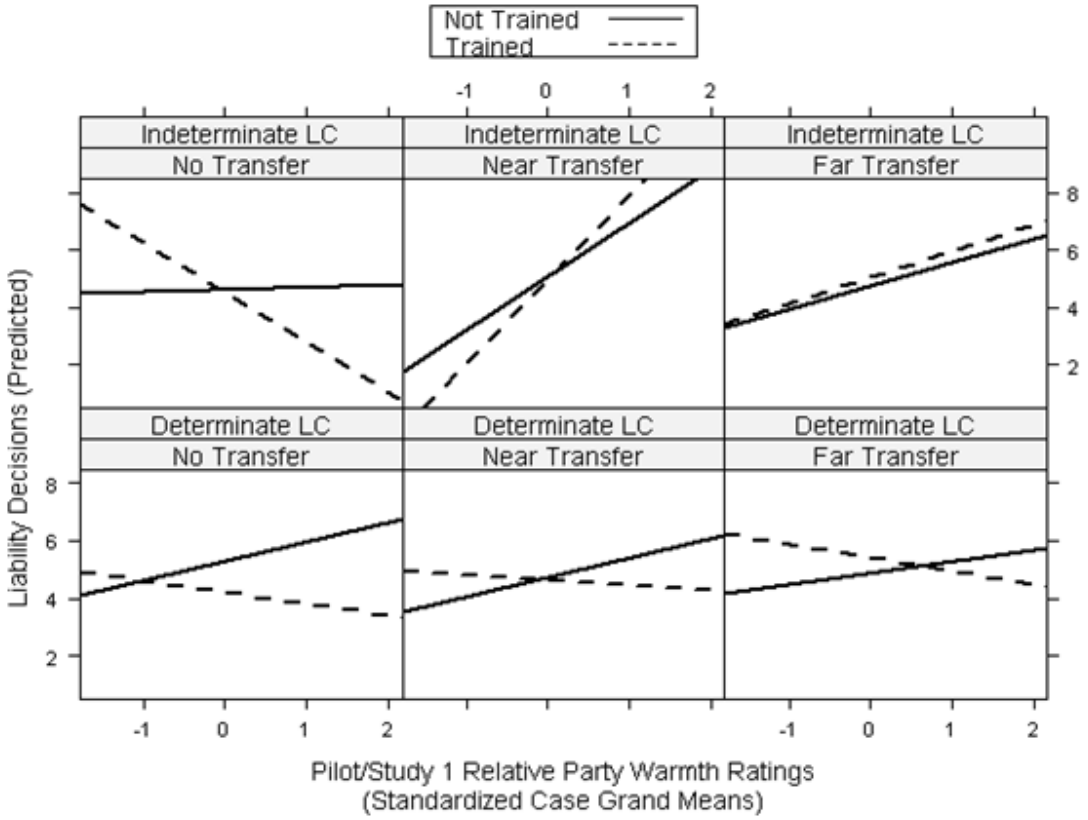


Table 21: Full-Factor Model of Effects of Training on Liability Decisions in Study 2			
Predictor / Factors (Computation / Levels)	**df**	***F*-value**	***p*-value**
RPW_{P1BL}	1	.68	.409
Training (Trg)	1	1.60	.206
Transfer (Trs)	2	.33	.717
Legal Category Indeterminacy (LCI)	1	.06	.812
RPW_{P1BL} x Trg	1	26.04	<.001
RPW_{P1BL} x Trs	2	.64	.528
Trg x Trs	2	10.19	<.001
RPW_{P1BL} x LCI	1	.50	.481
Trg x LCI	1	.37	.545
Trs x LCI	2	.06	.942
RPW_{P1BL} x Trg x Trs	2	9.99	<.001
RPW_{P1BL} x Trg x LCI	1	6.18	.013
RPW_{P1BL} x Trs x LCI	2	1.11	.3292
Trg x Trs X LCI	2	7.22	<.001
RPW_{P1BL} x Trg x Trs x LCI	2	10.26	<.001
Notes: Ps = 93, N = 2195.			

Focusing on the levels and interactions of interest, the main effect for RPW_{P1BL} was not significant; however, the interaction between RPW_{P1BL} and Training was highly significant. Further, the interaction was qualified by a highly significant interaction with Transfer as well as with Transfer and Legal Category Indeterminacy.

Table 22: Coefficients and Simple Slopes for Effects of Factors on Liability Decisions in Study 2

Predictor / Factor Levels	b	se	*p*-value
(Intercept)	5.29	1.04	<.001
RPW_{PBL}	.69	1.00	.489
MTrg	-1.12	.28	<.001
NTrs	-.55	1.41	.695
FTrs	-.41	1.45	.780
LCI	-.67	1.40	.633
RPW_{PBL} x MTrg	-1.11	.26	<.001
RPW_{PBL} x NTrs	-.02	1.28	.986
RPW_{PBL} x FTrs	-.29	1.40	.835
MTrg x NTrs	1.00	.36	.005
MTrg x FTrs	1.66	.37	<.001
RPW_{PBL} x LCI	-.61	1.50	.685
MTrg x LCI	1.00	.36	.005
NTrs x LCI	1.02	2.07	.623
FTrs x LCI	.53	1.98	.787
RPW_{PBL} x MTrg x NTrs	.26	.33	.430
RPW_{PBL} x MTrg x FTrs	.25	.36	.497
RPW_{PBL} x MTrg x LCI	-.71	2.39	.067
RPW_{PBL} x NTrs x LCI	1.79	1.99	.453
RPW_{PBL} x FTrs x LCI	1.02	.53	.609
MTrg x NTrs x LCI	-.97	.51	.068
MTrg x FTrs x LCI	-1.25	.51	.014
RPW_{PBL} x MTrg x NTrs x LCI	2.63	.61	<.001
RPW_{PBL} x MTrg x FTrs x LCI	1.69	.51	<.001

Notes: Ps = 93, N = 2195.

Predictor / Factor Levels	Indeterminate Category			Determinate Category		
	b	se	*p*-value	b	se	*p*-value
(Intercept)	4.62	.80	<.001	5.29	1.17	<.001
RPW_{PBL}	.08	.96	.936	.69	1.13	.539
MTrg	-.11	.24	.639	-1.12	.28	<.001
NTrs	.47	1.29	.717	-.55	1.59	.729
FTrs	.13	1.14	.909	-.41	1.64	.805
RPW_{PBL} x MTrg	-1.81	.28	<.001	-1.12	.27	<.001
RPW_{PBL} x NTrs	1.77	1.72	.302	-.03	1.45	.986
RPW_{PBL} x FTrs	.73	1.21	.545	-.29	1.59	.853
MTrg x NTrs	.03	.38	.943	1.01	.38	.008
MTrg x FTrs	.41	.34	.226	1.66	.39	<.001
RPW_{PBL} x MTrg x NTrs	2.88	.50	<.001	.27	.34	.435
RPW_{PBL} x MTrg x FTrs	1.93	.36	<.001	.25	.37	.502
	Simple Slopes: Transfer			**Simple Slopes: Transfer**		
Training Condition	**NoTrs**	**NTrs**	**FTrs**	**NoTrs**	**NTrs**	**FTrs**
	b	**b**	**b**	**b**	**b**	**b**
(Intercept)	4.62^{***}	5.09^{***}	4.75^{***}	5.29^{**}	4.74^{***}	4.88^{***}
RPW_{PBL}	.08	1.85^{*}	$.81^{***}$	.69	.67	.40
MTrg	-.11	-.09	.30	-1.12^{***}	-.11	.54
RPW_{PBL} x MTrg	-1.82^{***}	1.07^{*}	.12	-1.12^{***}	$-.85^{***}$	$-.87^{**}$
	Simple Slopes: MTrg | Trs			**Simple Slopes: MTrg | Trs**		
	b	**b**	**b**	**b**	**b**	**b**
RPW_{PBL} | Not MTrg	.09	1.86^{***}	$.81^{***}$	.68	.66	.40
RPW_{PBL} | M Trg	-1.73	2.91	$.93^{***}$	-.43	-.19	$-.47^{*}$

Follow-up analysis of simple slopes collapsing across non-significant factor-level combinations indicates that RPW_{P1BL} *was* a positive predictor of the Liability Decisions of participants who were not trained (b = .63, se = .14, p < .001).[22] By comparison, RPW_{P1BL} was *not* a significant predictor of the Liability Decisions of trained participants for case examples in the Determinate Legal Category, irrespective of the level of Transfer (b = -.19, se = .62, p = .756).[23] For participants who were trained in the Indeterminate Legal Category, whether RPW_{P1BL} was a positive predictor of Liability Decisions depended on the extent of Transfer. Specifically, RPW_{P1BL} was not a predictor of Liability Decisions in the No Transfer condition (b = -1.73, se = 2.24, p = .439), but was a marginally significant positive predictor in the Near Transfer condition (b =2.91, se = 1.55, p = .061) as well as a significant positive predictor in the Far Transfer condition (b =.93, se = .15, p < .001).

Secondary analysis: Legal Accuracy and Decision Confidence

With respect to the secondary dependent measures, using binomial-probit and linear mixed effects models, respectively, to control for the lack of independence in participant responses and cases, Legal Accuracy and Decision Confidence were each regressed on RPW_{P1BL}, Training, Transfer, and Legal Category Indeterminacy, as well as the higher-order interactions among them. As in Study 1, with respect to Legal Accuracy, only Training, Transfer, and the Training x Transfer interaction were

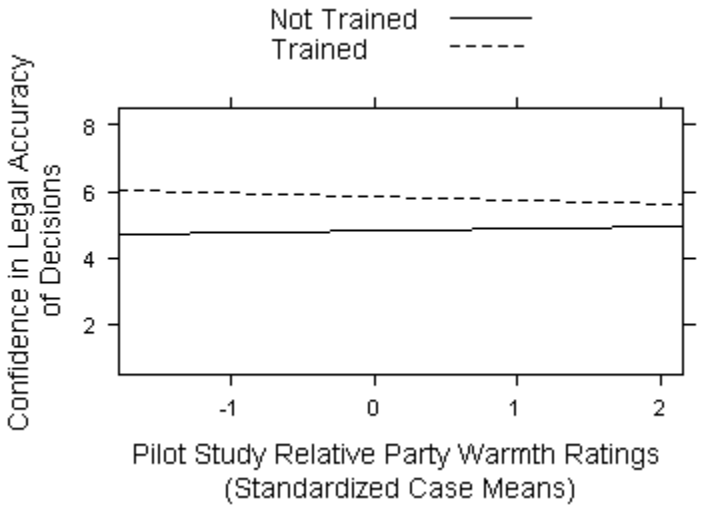
[22] The interaction between RPW_{P1BL}, Transfer, Indeterminacy, and the higher-order interactions among them were nonsignificant and thus omitted from the model.

[23] The interaction between RPW_{P1BL} and Transfer was nonsignificant and thus omitted from the model.

Table 23: Effects of Relative Party Warmth and Training on Decision Confidence in Study 2

Predictor / Factors (Computation / Levels)	***F*-value**	***p*-value**
RPW_{P1BL}	.22	.637
Trg	28.73	<.001
RPW_{PBL} x Trg	12.28	<.001

Predictors / Factor Level	**Study 1: M9**		
	b	**se**	***p*-value**
(Intercept)	4.84	.17	<.001
RPW_{P1BL}	.07	.10	.487
MTrg	.99	.18	<.001
RPW_{P1BL} x MTrg	-.18	.05	<.001
	Simple Slopes		
Training Condition	NoTrg		MTrg
(Intercept)	4.84^{***}		5.83^{***}
RPW_{P1BL}	.07		-.11



Notes: Ps = 93, N = 2187.

significant predictors. Removing the nonsignificant variables, the results are thus identical to those reported above for the Training Manipulation Check. By comparison, Training and the RPW_{P1BL} x Training interaction were both significant predictors of Decision Confidence (see Table 23). In particular, participants with training that matched the case they were deciding were significantly more confident that their decisions were legally accurate than those who were not trained. However, confidence was attenuated to the extent that RPW_{P1BL} increased.

Study 2 discussion

Study 2 extended the findings of Study 1 by testing the CCAM hypotheses under more complex learning conditions, i.e., with participants who were trained in and had to apply all three of the relevant legal categories. The results provide strong support for Hypothesis 5. In particular, the Liability Decisions of participants who were untrained were influenced by socially-shared stereotypic associations between the social categories of the parties in the examples and the trait of warmth. In addition, participants who were trained in and who were deciding cases in the negligence cases, the indeterminate legal category, were able to avoid relying on the stereotypic associations for the very cases that they saw in training, i.e., the No-Transfer cases. Unlike participants in Study 1, who were able to avoid stereotype use in Near-Transfer cases, for Study 2 participants, the effects of training did not extend to case examples with similar surface features to those included in training. Thus, in combination with Study 1 findings, these results suggest that the increased complexity of learning more legal categories adversely affected participants' ability to transfer their learning of the indeterminate legal rules.

By comparison, Study 2 participants who were assigned to the ultra-hazardous-activity and no-duty-to-act cases were again able to avoid relying on the stereotypic associations irrespective of the level of transfer for the cases. This is further evidence for H4 and the strong limit of CCAM when situation categories are determinate, even where multiple types of situation categories have been learned.

Turning to the effect sizes of the results in Study 2 as an estimate of social bias and the conditional ability of individuals with training to avoid it, the odds that participants' liability decisions were consistent with the use of social stereotypes were again computed as in Study 1. Table 24 provides the odds, as well as the odds ratios between, the major conditions of interest. As a baseline, for participants in the control condition or whose training did not match the case being decided, the odds that a liability decision was consistent with the use of social stereotypes was similar to, if slightly higher than, that in Study 1: 1.61, or over 3-to-2. In the Determinate Legal Category and Indeterminate Legal Category x No Transfer conditions, by comparison, the odds again

Table 24: Study 2 Liability Effect Sizes

	NoTrg	**Trg LCD**	**Trg LCI NoTrs**	**Trg LCI NrTrs**	**Trg LCI FTrs**
Odds of Liability Decision Conforming to RPW_{BL} Prediction	1.61	1.05	1.11	5.76	2.21
	Odds Ratios				
NoTrg	1	1.53	1.44	.28	.73
Trg LCD	.65	1	.94	.18	.47
Trg LCI NoTrs	.70	1.08	1	.19	.51
Trg LCI NrTrs	3.59	5.50	5.16	1	2.61
Trg LCI FTrs	1.37	2.11	1.97	.38	1

Notes: Odds ratios above the diagonal are vertically listed conditions/horizontally listed conditions with; odds ratios below the diagonal reflect the inverse pattern.

hovered around 1 (i.e., 1.05, or 21-to-20, and 1.11, or 10-to-9, respectively), suggesting little or no stereotype use.

As in Study 1, the odds of stereotypes influencing participants' decisions was higher than the base line in the Indeterminate Legal Category x Far Transfer condition (i.e., 2.21 or almost 9-to-4). This was substantially exceeded, however, by the odds in the Indeterminate Legal Category x Near Transfer condition (i.e., 5.76), which approached 6-to-1 in favor of stereotype use. Again, it appears that the combination of training and individuating information in the case examples may have effectively given participants permission to knowingly or unknowingly rely upon social stereotypes when deciding negligence cases, which, notwithstanding the training, were still functionally ambiguous.

Study 3

Overview and Design. Study 3 represents an extension of Study 2 to a sample with considerably more naturalistic training and experience than that provided experimentally in Studies 1 and 2: Law students who have completed a course in tort law. Accordingly, it tests CCAM's predictions in a sample with psychological characteristics closer to those of individuals engaged in legal practice. In addition, although participants in the control group in Study 1 and Study 2 were not told anything about the legal categories used in the cases, Study 3 participants in the No Training condition were told the names of the tort categories that were relevant to the study but not given any additional information about them. Thus, the control group in Study 3 provides a way to compare the effectiveness of the training manipulation used in Studies 1 and 2 with that of the instruction received in an entire course in tort law. Similar results

between the Torts-Course Control and Torts-Course plus Training Conditions in Study 3 and those of the training conditions in Studies 1 and 2 are an indication that, with respect to the dependent variables used here, the training manipulation produces a level of training and expertise that approximates that presumably available in law school.

Study 3 follows a 2 (Training: Yes, No) X 2 (RPW_{BL} Advantage: Plaintiff, Defendant) X 2 (Case Category Response: Liability, No Liability) X 2 (Legal Category Indeterminacy: Determinate, Indeterminate) X 3 (Transfer: No, Near, Far) mixed

Table 25: Design for Study 3

Social Category Response	Legal Category Response	Legal Category Indeterminacy	Transfer	**In-Study Training (& Torts Class)**	**No In-Study Training (Torts Class Only)**
Liability	Liability	Low	No	49	335
			Near	49	
			Far	49	
		High	No	49	
			Near	49	
			Far	49	
	No Liability	Low	No	49	
			Near	49	
			Far	49	
		High	No	49	
			Near	48	
			Far	48	
No Liability	Liability	Low	No	48	337
			Near	49	
			Far	49	
		High	No	49	
			Near	49	
			Far	49	
	No Liability	Low	No	49	
			Near	49	
			Far	49	
		High	No	49	
			Near	49	
			Far	49	

Note: Between-participants variables are in bold. Cell values indicate the number of case example decisions in the cell in the Study 2 sample.

factorial design. Of these, Training is a between-participants variable, whereas the remainder are manipulated within participants. Table 25 depicts the design.

As in the earlier studies, dependent measures are Liability Decision, Legal Accuracy, and Decision Confidence.

All participants were randomly assigned to a Training or No Training condition. All training condition participants completed training on all three of the tort case categories. In contrast to prior studies, to control for salience of the legal rules, participants in the No Training Condition were also told what three tort categories were relevant to the study and the $40 accuracy incentive was made available to them.

Participants. Participants for Study 3 (N = 77) were recruited from two law schools in the upper Midwest. Each was paid $25 for participating. As in Studies 1 and 2, the 10 participants in the study with the most legally accurate responses also received $40 as part of an incentive to attend to and apply the training.

Participant ages ranged from 21 to 36 (MDN = 25); 58% were female; 76% self-identified as white, 13% Asian, 4% black, 4% Hispanic, and 1% other; and 99% were native English speakers. All participants had completed a course in tort law. Their College GPAs ranged from 2.5 to 4.0 (MDN = 3.7) and Law School GPAs from 2.6 to 4.0 (MDN = 3.3). LSAT scores ranged from 126 to 175 (1^{st} Qt = 158, MDN = 166, 3^{rd} Qt = 169), approximating the range observable for students in law schools ranked in the top 50 by U.S. News (Top-Law-Schools.com, 2012).

Materials. The materials for Study 3 were the same as those used in Studies 1 and 2, with three exceptions. First, the introductory PowerPoint presentation in the No

Training condition contained additional text informing the participants about which legal categories were applicable to the case examples they would read. Second, information about the availability of the $40 accuracy incentive was added to the No Training presentation. Finally, whereas the measures of party warmth and competence in the Pilot, Study 1, and Study 2 were four items each, in Study 3, participants completed only one item for each measure. The one-item measures were selected from the four available from each scale on the basis of which had the highest inter-item correlation with the relevant scale.

Procedure. The procedure for Study 3 was the same as that for Study 2 with the exception of the No Training control condition. To control for the effects of merely knowing which of the many topics covered in a torts class would be relevant in the study, in the first portion of the study, participants in the No-Training condition were told the names of the three legal categories that judges used to decide the case examples. In addition, all participants were told about the $40 incentive for rendering legally accurate decisions, not only those in the Training condition.

Results

Data preparation. Prior to analysis, scores were computed for each scale and its reliability computed and recorded. Table 26 lists the reliability (where applicable), mean, and standard deviations for all of the measured variables in Study 3, as well as the zero-order correlations between them, for the entire Study 3 sample. Inter-party ratings of warmth and competence were significantly positively correlated, but less so than in prior

Table 26: Descriptive Statistics and Zero Order Correlations for Measured Variables in Study 3

	PW	PC	DW	DC	SE	C	SM	MCP	EMCP	IMCP	RWA	SDO	CA	LD	LA	Cf
Plaintiff Warmth (PW) (M=5.5, SD=1.9)	X	1841	1842	1842	1842	1842	1818	1794	1794	1818	1794	1674	1772	1842	1842	1841
Plaintiff Competence (PC) (M =5.9, SD =1.9)	**.41**	X	1841	1841	1841	1841	1817	1793	1793	1817	1793	1673	1771	1841	1841	1840
Defendant Warmth (DW) (M =5.4, SD =1.8)	**.11**	**.09**	X	1842	1842	1842	1818	1794	1794	1818	1794	1674	1772	1842	1842	1841
Defendant Competence (DC) (M=5.4, SD =1.9)	.08	**.16**	**.33**	X	1842	1842	1818	1794	1794	1818	1794	1674	1772	1842	1842	1841
Self Efficacy (SE) (α=.85, M =5.6, SD =.64)	.02	.03	.05	.05	x	77	76	77	75	76	75	70	74	1842	1842	1841
Contentiousness (C) (α=.71, M =5, SD =.68)	.01	.04	.01	**.10**	**.45**	x	76	77	75	76	75	70	74	1842	1842	1841
Study Motivation (SM) (α=.78, M =4.8, SD =.9)	**-.12**	.07	-.05	0	.21	**.27**	x	76	74	75	74	69	73	1818	1818	1818
Mot. Contr. Prej. (MCP) (α=.85, M =4.2, SD =.85)	**.13**	**.13**	-.02	.03	.12	-.15	-.18	x	75	76	75	70	74	1794	1794	1793
External (EMCP) (α=.80, M =4.3, SD =1.0)	**.15**	**.13**	0	.03	-.04	.11	-.02	-.03	x	75	74	69	73	1794	1794	1793
Internal (IMCP) (α=.69, M =4, SD =1.1)	.07	**.08**	-.06	.02	-.1	.19	-.02	.07	**.64**	x	75	70	74	1818	1818	1817
Right Wing Authoritarianism (RWA) (α=.84, M =3, SD =1.0)	.03	.03	.08	**.10**	-.06	-.01	.08	-.16	-.02	-.12	x	70	73	1794	1794	1793
SDO (α=.89, M =2.2, SD =.86)	-.03	-.05	.07	.05	-.07	**-.27**	-.11	-.04	**-.29**	**-.47**	**.61**	x	68	1674	1674	1673
LSAT Cognitive Ability (CA) (M =163, SD =8)	.07	-.07	-.03	**-.14**	-.05	-.21	-.21	.09	-.17	**-.26**	-.13	.17	x	1842	1772	1771
Liability Decision (LD) (M =4.8, SD =2.6)	**.11**	**.11**	.07	-.05	.03	.01	.01	.03	.03	.02	.05	.03	.02	x	1842	1841
Legally Accurate (LA) (M =.7, SD =.5)	-.02	.02	.03	.04	.05	0	.04	-.02	-.03	-.01	-.01	-.03	.01	-.03	x	1841
Confidence (Cf) (M =5.39, sd=1.6)	0	.02	.03	.02	**.21**	.07	.06	**-.15**	**-.15**	**-.11**	.01	.07	**.10**	.07	**.24**	x

Notes: Values above and below the diagonal are sample sizes and correlation coefficients, respectively. All bolded coefficients were statistically significant at $p < .05$ after adjusting for multiple tests. *P*-values are not adjusted for the lack of independence between raters or in the underlying cases.

studies. This is expected given that the ratings in Study 3 were based upon a one-item measure, whereas prior studies used a score based upon four items. In addition, ratings of Plaintiffs' warmth and competence were significantly, albeit modestly positively correlated with Liability Decisions. Ratings of the Defendants' warmth and competence were not significant predictors of Liability Decisions. Again, none of the zero-order correlations between individual differences and Liability Decisions were significant.

Baseline Relative Party Warmth. In Study 3, RPW_{BL} ratings were calculated using the grand mean of the relative party warmth ratings for each case by participants in the Pilot Study, and no-training control groups in Studies 1 and 2 (RPW_{P12BL}) predictor for Study 2. As indicated in Table 8 (p. 99), the base-line ratings across these studies were highly correlated ($.86 \geq r \geq .77$), suggesting that stereotypic perceptions of the relative warmth of the plaintiffs and defendants are highly consistent.

***Manipulation Check: Training*.** Study 3 is designed, in part, as a comparison test of how the training used in the experiments compares to that received in law school. In addition, it is also a test of CCAM in a population closer to that of practicing lawyers. As with Studies 1 and 2, a preliminary question is thus, irrespective of social category use, did training affect participants' decisions at all? If so, how did the response of those participants with training compare to those in the Control Condition who were relying upon their existing knowledge of tort law? To answer these questions for each dependent variable, a mixed-effects model was fitted, controlling for lack of independence in participants and cases by including each as a random effect.

Liability Decision. In the first model, Liability Decision was regressed on a Training factor (i.e., Torts Class only or Torts plus Training) a Transfer factor (i.e., No, Near, or Far Transfer), a Legal Liability factor (i.e., whether the judge's decision in the case on which the example was based was for liability), and an indicator code for the Indeterminacy of the legal rule (1 = Determinant), as well as the higher order interactions between these variables (Study 3: M1). Table 27 provides the *F*-values and coefficients for each factor and factor-level in Study 3: M1, as well as their respective significance

Table 27: Manipulation Check Test of Training for Study 3 - Liability Decisions

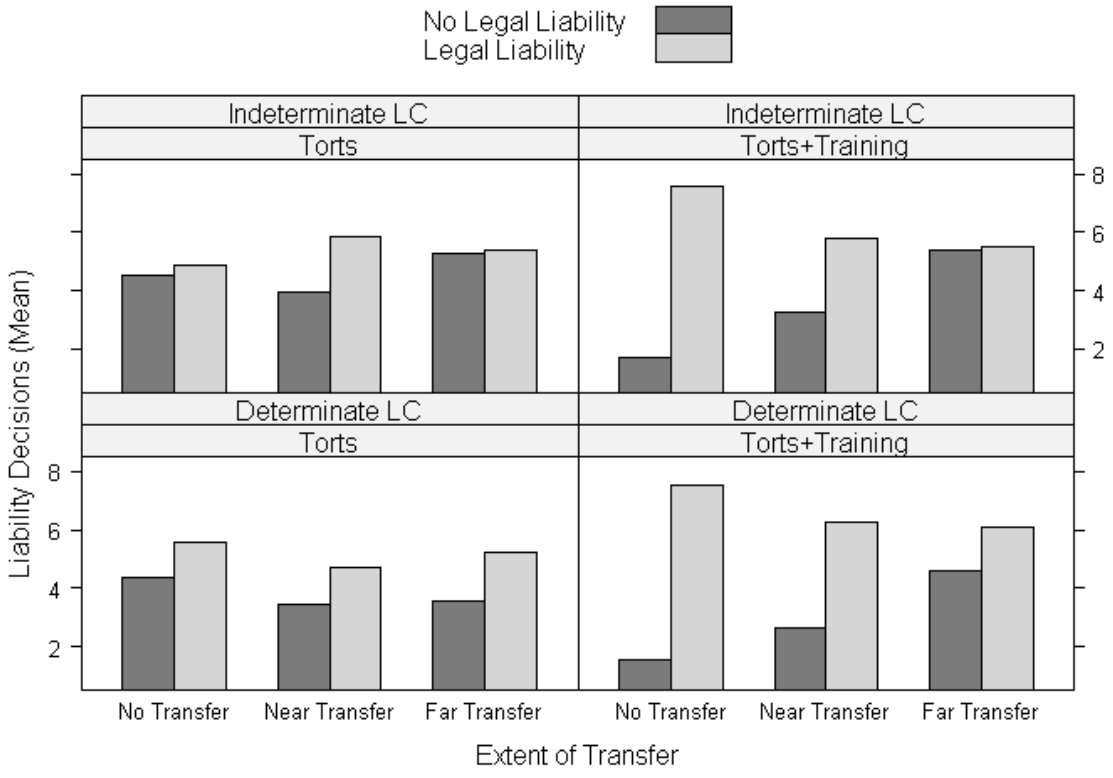
	df	*F*-value	*p*-value	b	se	*p*-value
(Intercept)				4.34	.62	<.001
In-Study Training (Trg)	1	.56	.384	-2.77	.32	<.001
Legal Liability (LL)	1	52.95	<.001	1.25	.87	.153
Transfer: Near Transfer (NTrs)	2	1.58	.207	-.88	.87	.317
Transfer: Far Transfer (FTrs)				-.75	.87	.391
Legal Category Indeterminate (LCI)	1	.41	.522	.18	.87	.838
Trg x LL	1	146.91	<.001	4.75	.44	<.001
Trg x NTrs	2	5.66	.004	1.94	.44	<.001
Trg x FTrs				3.79	.44	<.001
LL x NTrs	2	7.48	<.001	.02	1.24	.989
LL x FTrs				.41	1.24	.740
Trg x LCI	1	4.89	.027	-.03	.44	.942
LL x LCI	1	1.32	.251	-.93	1.24	.453
NTrs x LCI	2	.16	.852	.31	1.24	.800
FTrs x LCI				1.51	1.24	.223
Trg x LL x NTrs	2	73.32	<.001	-2.35	.63	<.001
Trg x LL x FTrs				-4.93	.63	<.001
Trg x LL x LCI	1	.47	.495	.80	.63	.202
Trg x NTrs x LCI	2	4.54	.011	.16	.63	.798
Trg x FTrs x LCI				-.89	.63	.156
LL x NTrs x LCI	2	.22	.801	1.51	1.75	.388
LL x FTrs x LCI				-.60	1.75	.733
Trg x LL x NTrs x LCI	2	4.32	.014	-2.51	.89	.005
Trg x LL x FTrs x LCI				-.64	.89	.470

Notes: Ps = 77, N = 1842

values. Focusing on the terms of primary interest, Legal Liability, the two-way interaction between Legal Liability and Training, the three-way interaction between these variables and Transfer, and the four-way interaction among all of the variables were significant predictors of Liability Decision.

Figure 13 illustrates the pattern of decisions. As shown in the right-column, Legal Liability substantially affected the liability decisions of participants who had taken a torts class and received training in the study. Moreover, the extent of transfer moderated this effect, as did Legal Category Indeterminacy. Participants were less able to apply the

Figure 13: Manipulation Check Test of Training for Study 3 - Liability Decisions



legal rules they learned to Near Transfer case examples. Moreover, on Far Transfer cases, they were not able to apply the rules any better than participants who had only taken a course in tort law.

How well were participants who had taken a torts class but did not have any in-study training able to apply their knowledge to the case examples? The pattern of decisions in the left column in Figure 13 suggests that they were able to do so approximately as well as those with training did in the Near-to-Far Transfer conditions: In each of the six pairs of conditions illustrated, participants' decisions in the cases in which there was legal liability had a higher mean than for the No Legal Liability cases.

To test the question directly, as a follow-up analysis, Study 3: M1 was rerun on the subset of participants who did not receive training in the study, omitting non-significant higher order interactions between Legal Liability and the Training, Transfer, and Indeterminacy factors. The result was significant. In particular, Legal Liability was a significant predictor of the Liability Decisions of even those participants who had not received training in the study (b = 1.08, se = .40, p = .007).[24]

Thus, unlike introductory psychology students who participated in Studies 1 and 2, law students in the control group were able to decide cases in a way that was legally accurate. Moreover, as one would expect considering that they had not been exposed to any of the case examples before, the extent of transfer from examples used in training was irrelevant to their ability to do so.

[24] The same analysis conducted on Liability Decisions of Trained participants in the most comparable condition, the Far-Transfer cases, yields a coefficient of similar magnitude: b = .80.

Legal Accuracy and Decision Confidence. The secondary dependent variables [i.e., Legal Accuracy (Study 3: M2) and Decision Confidence (Study 3: M3)] were then regressed separately on the predictors from Study 3: M1.[25] Table 28 provides the *F*-values for each factor for these models, as well as their respective significance values. Coefficient estimates and their significance values are given in Table 29. In both models, the Training and Transfer factors, the interaction between them, and the four-way interaction among all of the factors were significant.

Table 28: Manipulation Check Test of Training for Study 3 - Legal Accuracy

Predictor / Factors (Computation / Levels)	**Legal Accuracy**				**Decision Confidence**	
	df	**Chi-Squared**	***p*-value**	**df**	***F*-value**	***p*-value**
Legal Liability (LL)	1	3.53	.060	1	1.97	.161
Training (Trg)	1	48.81	<.001	1	34.50	<.001
Transfer (Trs)	2	8.99	.011	2	19.98	<.001
Legal Category Indeterminacy (LCI)	1	.87	.350	1	.52	.470
LL x Trg	1	1.46	.227	1	.05	.819
LL x Trs	2	4.18	.124	2	.17	.838
Trg x Trs	2	74.91	<.001	2	42.79	<.001
LL x LCI	1	.77	.380	1	.55	.458
Trg x LCI	1	2.06	.152	1	.01	.917
Trs x LCI	2	.84	.657	2	.33	.713
LL x Trg x Trs	2	2.57	.276	2	1.25	.287
LL x Trg x LCI	1	5.70	.017	1	.60	.440
LL x Trs x LCI	2	1.10	.578	2	4.23	.015
Trg x Trs X LCI	2	4.07	.131	2	3.51	.030
LL x Trg x Trs x LCI	2	7.41	.025	2	3.76	.024
Notes: Ps = 77, N = 1842.						

Figure 14 illustrates the pattern of results for each model. As in Studies 1 and 2, Training significantly increased participants accuracy and confidence in their decisions. Similarly, the extent to which the case examples resembled those used in training moderated this effect; both the accuracy and the confidence of participants who received

[25] As before, to account for the dichotomous Legal Accuracy dependent measure, a binomial probit general linear mixed-effects model was used for Study 3: M2.

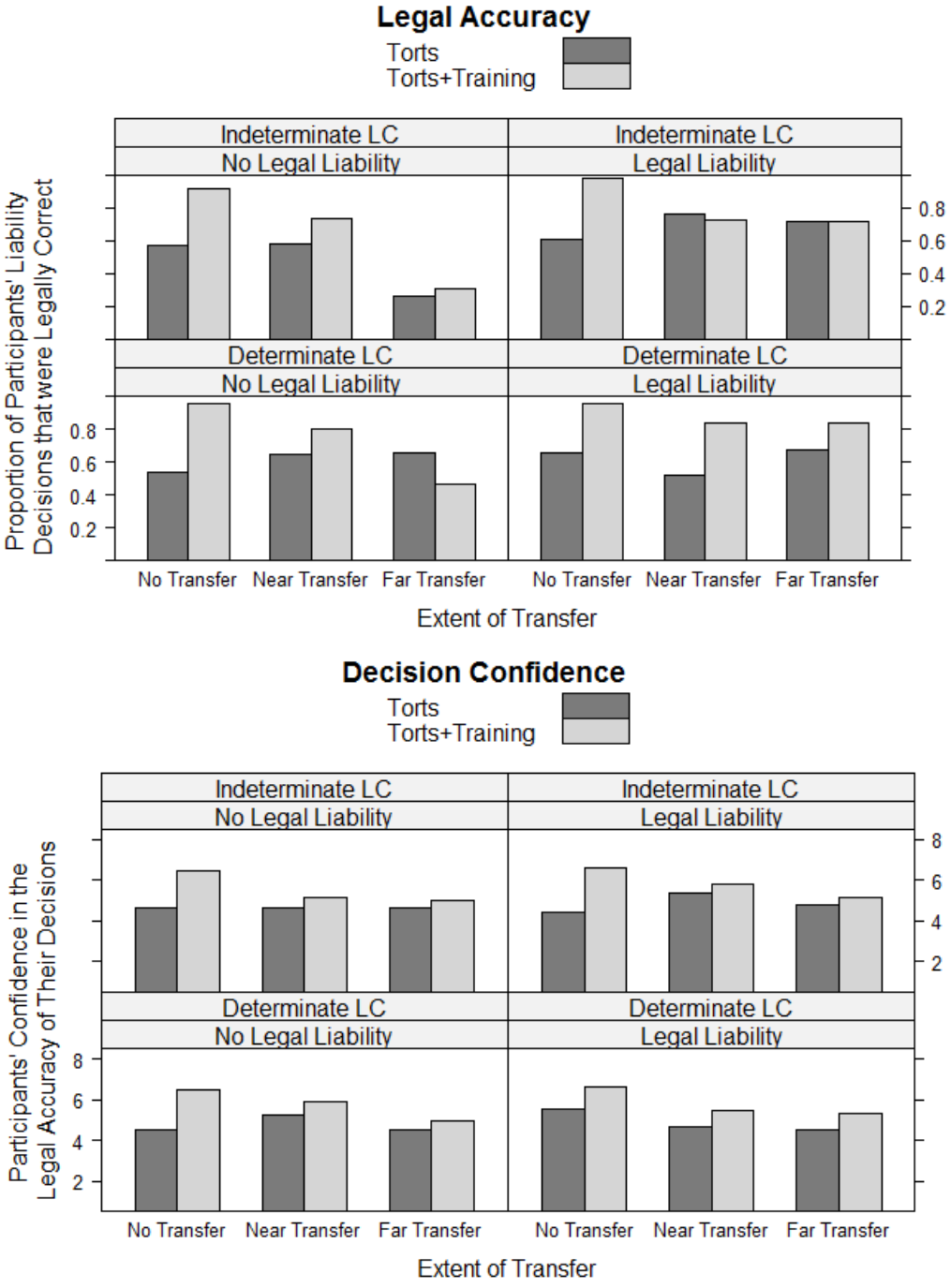
training in the study declined as transfer increased to the point that, in some conditions, participants without training were actually more accurate or confident than those without.

Unlike the results in prior studies, in Study 3 participants' accuracy and confidence were also moderated by higher order interactions between the Legal Liability in the underlying case and the Indeterminacy of the Legal Category. This is possibly due to the lack of a true control group and correspondingly greater knowledge of all participants. However, given the large size of the sample of decisions and relatively small effects for the higher-order interaction, it is also possible that the inconsistency is an artifact of the specific data (i.e., a Type I error).

Table 29: Manipulation Check Test of Training for Study 3 - Decision Confidence

	Legal Accuracy			**Decision Confidence**		
	b	se	p-value	b	se	p-value
(Intercept)	.09	.33	.780	4.48	.28	<.001
LL	.43	.47	.358	1.05	.36	.003
Trg	1.72	.29	<.001	1.97	.26	<.001
NTrs	.32	.47	.497	.75	.36	.036
FTrs	.33	.47	.477	.04	.36	.920
LCI	.09	.47	.843	.13	.36	.727
LL x Trg	-.15	.44	.731	-.85	.3	.005
LL x NTrs	-.80	.67	.230	-1.63	.51	.001
LL x FTrs	-.39	.67	.563	-1.05	.51	.037
Trg x NTrs	-1.17	.37	.002	-1.3	.3	<.001
Trg x FTrs	-2.22	.36	<.001	-1.53	.3	<.001
LL x LCI	-.34	.66	.610	-1.23	.51	.015
Trg x LCI	-.47	.39	.222	-.12	.3	.682
NTrs x LCI	-.29	.66	.662	-.75	.51	.137
FTrs x LCI	-1.24	.66	.062	.04	.51	.938
LL x Trg x NTrs	.56	.55	.304	.97	.43	.025
LL x Trg x FTrs	1.19	.54	.028	1.22	.43	.005
LL x Trg x LCI	.73	.61	.232	1.15	.43	.007
LL x NTrs x LCI	1.44	.95	.128	2.57	.72	<.001
LL x FTrs x LCI	1.68	.94	.075	1.32	.71	.065
Trg x NTrs x LCI	.40	.50	.422	.02	.43	.959
Trg x FTrs x LCI	1.15	.50	.021	.03	.43	.951
LL x Trg x NTrs x LCI	-1.79	.77	.020	-1.41	.61	.021
LL x Trg x FTrs x LCI	-1.96	.76	.010	-1.48	.61	.015

Figure 14: Effects of Training on Legal Accuracy and Decision Confidence in Study 3



Manipulation Check: Social Liability. Before testing the CCAM hypotheses about the extent to which participants may be able to use their training in legal categories

to avoid applying social categories, it is also necessary to verify in the Study 3 sample that Social Liability cues continued to have the expected effect. To test this, Pilot: M1 through Pilot: M4 were replicated using the responses from participants in the control condition in Study 1. The results of these analyses, shown in Table 30, are substantively identical to those for the selected case examples in the Pilot Study as well as in Studies 1 and 2. In particular, the Social Liability indicator code was a highly significant predictor of RPW_{S3} (see Study 3: M3). In addition, both the Social Liability indicator code (Study 3: M4) and RPW_{S3} (Study 3: M5) were highly significant positive predictors of liability decisions. Finally, neither the Legal Liability indicator code nor its interaction with RPW_{S3} were significant (Study 3: M6). Thus, the social liability cues embedded in the case examples continued to function as expected in the law-student sample.

Table 30: Manipulation Check Tests of Social Liability and Relative Party Warmth in Study 3												
	Study 3: M3 (RPW_{S3})						**Study 3: M4 (Liability Decision)**					
	df	***F*-value**	***p*-value**	**b**	**se**	***p*-value**	**df**	***F*-value**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				.15	.31	.612				4.16	.29	<.001
Social Liability	1	3.96	.047	.73	.37	.047	1	8.45	.004	1.14	.39	.004
	Ps = 28, N = 671						Ps = 28, N = 671					
	Study 3: M5 (Liability Decision)						**Study 3: M6 (Liability Decision)**					
	df	***F*-value**	***p*-value**	**b**	**se**	***p*-value**	**df**	***F*-value**	***p*-value**	**b**	**se**	***p*-value**
(Intercept)				4.65	.24	<.001				4.07	.29	<.001
RPW_{S3}	1	15.83	<.001	.15	.04	<.001	1	15.73	<.001	.14	.05	.005
Legal Liability (LL)	NA						1	9.25	.002	1.17	.39	.003
RPW_{S3} x LL							1	.21	.649	.03	.07	.649
	Ps = 28, N = 671						Ps = 28, N = 671					

Primary Analysis: Liability Decisions. The results of Study 3 again support Hypothesis 5. To test the hypotheses in Study 3, using a mixed effects model with participants and Cases as random variables, Liability Decision was regressed on the four predictors and their higher-order interactions (Study 2: M7). Table 31 provides the *F*-values for each factor in Study 2: M7, as well as their respective significance values; regression coefficients for the full model and simple-slopes subset models are given in Table 32.

Table 31: Full-Factor Model of Effects of Training on Liability Decisions in Study 3

Predictor / Factors (Computation / Levels)	**df**	***F*-value**	***p*-value**
RPW_{P12BL}	1	.02	.880
Training (Trg)	1	.76	.385
Transfer (Trs)	2	.33	.722
Legal Category Indeterminacy (LCI)	1	.06	.808
RPW_{P12BL} x Trg	1	16.78	<.001
RPW_{P12BL} x Trs	2	.37	.690
Trg x Trs	2	9.93	<.001
RPW_{P12BL} x LCI	1	.66	.418
Trg x LCI	1	6.21	.013
Trs x LCI	2	.04	.961
RPW_{P12BL} x Trg x Trs	2	18.75	<.001
RPW_{P12BL} x Trg x LCI	1	.57	.449
RPW_{P12BL} x Trs x LCI	2	.64	.527
Trg x Trs X LCI	2	8.45	<.001
RPW_{P12BL} x Trg x Trs x LCI	2	2.86	.058
Notes: Ps = 77, N = 1842.			

Focusing on the levels and interactions of primary interest, the main effect for RPW_{P12BL} was not significant; however, the interaction between it and Training was highly significant. Further, the RPW_{P12BL} x Training interaction was qualified by a significant interaction with Transfer, which, in turn, was qualified by a marginally significant interaction with Indeterminacy.

Table 32: Coefficients and Simple Slopes for Effects of Factors on Liability Decisions in Study 3

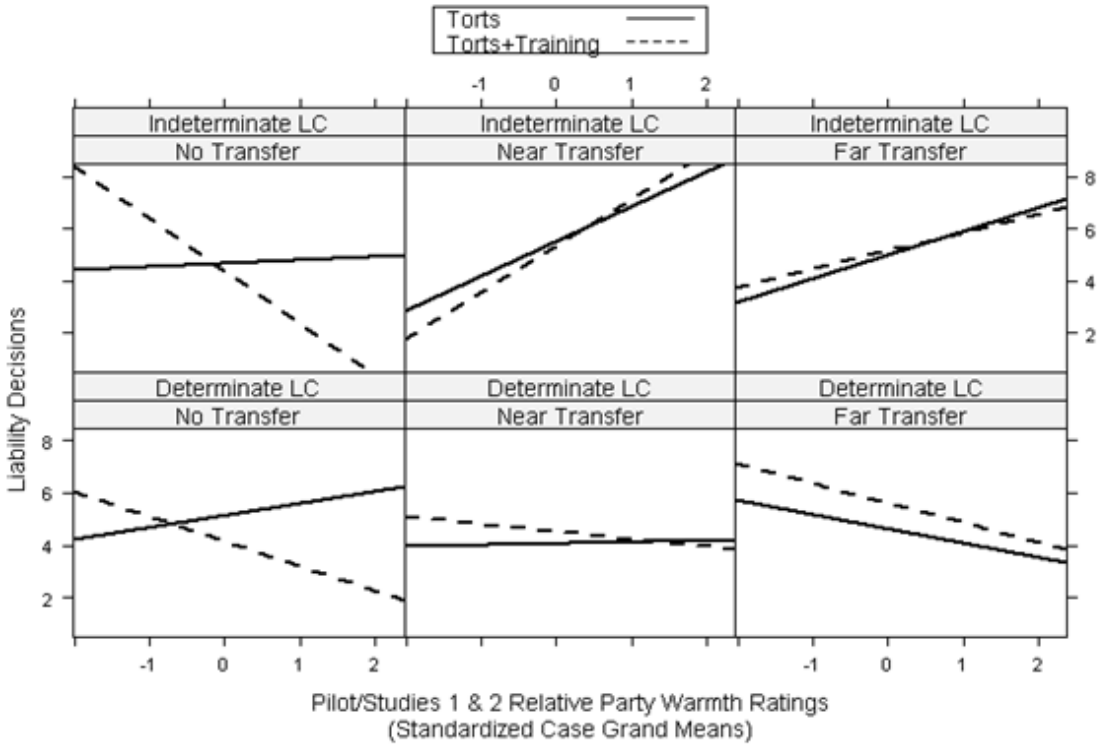
Predictor / Factor Levels	b	se	*p*-value
(Intercept)	5.16	1.08	<.001
RPW_{P12BL}	.46	1.03	.659
MTrg	-1.01	.27	<.001
NTrs	-1.07	1.48	.468
FTrs	-.54	1.51	.720
LCI	-.47	1.47	.752
RPW_{P12BL} x MTrg	-1.41	.25	<.001
RPW_{P12BL} x NTrs	-.41	1.31	.756
RPW_{P12BL} x FTrs	-1.00	1.44	.489
MTrg x NTrs	1.47	.35	<.001
MTrg x FTrs	2.01	.36	<.001
RPW_{P12BL} x LCI	-.34	1.71	.844
MTrg x LCI	.71	.35	.043
NTrs x LCI	1.88	2.24	.400
FTrs x LCI	.84	2.09	.686
RPW_{P12BL} x MTrg x NTrs	1.08	.31	.001
RPW_{P12BL} x MTrg x FTrs	1.20	.34	.001
RPW_{P12BL} x MTrg x LCI	-.71	.41	.083
RPW_{PBL} x NTrs x LCI	1.58	2.69	.557
RPW_{PBL} x FTrs x LCI	1.79	2.2	.417
MTrg x NTrs x LCI	-1.29	.53	.016
MTrg x FTrs x LCI	-1.55	.50	.002
RPW_{PBL} x MTrg x NTrs x LCI	1.53	.64	.017
RPW_{PBL} x MTrg x FTrs x LCI	.70	.52	.181

Notes: Ps = 77, N = 1842

Predictor / Factor Levels	Indeterminate Category			Determinate Category		
	b	se	*p*-value	b	se	*p*-value
(Intercept)	4.69	0.88	<.001	5.16	1.2	<.001
RPW_{PBL}	0.12	1.2	.921	0.46	1.14	.691
Trg	-0.3	0.24	.215	-1.01	0.27	<.001
NTrs	0.81	1.47	.584	-1.07	1.64	.513
FTrs	0.31	1.27	.811	-0.54	1.67	.747
RPW_{PBL} x Trg	-2.12	0.33	<.001	-1.41	0.25	<.001
RPW_{PBL} x NTrs	1.17	2.06	.568	-0.41	1.46	.779
RPW_{PBL} x FTrs	0.79	1.46	.589	-1.00	1.6	.532
Trg x NTrs	0.17	0.4	.665	1.47	0.36	<.001
Trg x FTrs	0.46	0.35	.179	2.01	0.36	<.001
RPW_{PBL} x Trg x NTrs	2.61	0.56	<.001	1.08	0.32	<.001
RPW_{PBL} x Trg x FTrs	1.9	0.4	<.001	1.2	0.35	<.001
	Simple Slopes: Transfer			**Simple Slopes: Transfer**		
Training Condition	**NoTrs**	**NTrs**	**FTrs**	**NoTrs**	**NTrs**	**FTrs**
	b	**b**	**b**	**b**	**b**	**b**
(Intercept)	4.69^{***}	5.50^{***}	5.00^{***}	5.16^{**}	4.08^{***}	4.62***
RPW_{PBL}	.12	1.29	.91	.46	.05	-.54
Trg	-.30	-.12	.16	-1.01^{***}	$.46^{+}$	1.01***
RPW_{PBL} x Trg	-2.12^{***}	.50	$-.21^{***}$	-1.41^{***}	-.33	-.21
	Simple Slopes: Trg | Trs			**Simple Slopes: Trg | Trs**		
	b	**b**	**b**	**b**	**b**	**b**
RPW_{PBL} | No Trg	.12	1.29	$.91^{*}$	$.46^{*}$	.05	-.54
RPW_{PBL} | Trg	-2.00	1.79	$.70^{*}$	-.96	-.29	$-.75^{+}$

Figure 12 illustrates the relationship between RPW_{P12BL} and Liability Decisions across the factor-level combinations in the full model.

Figure 12: Study 3 Full Factorial Model – Liability Decisions



Follow-up analysis of key relationships collapsing across non-significant factor levels indicates that training moderates the effects of RPW_{P12BL} on participants' liability decisions, *but only for cases in the No Transfer condition* (b = -1.58, se = .19, $p < .001$). By comparison, unlike the results of prior studies, training did *not* moderate the effects of RPW_{P12BL} on participants' liability decisions in cases in the Near- and Far-Transfer conditions (b = -.07, se = .12, $p = .562$). Rather, at the levels of transfer that required participants to do more than merely remember the stimulus included in the training, for cases in the Indeterminate Legal Category, RPW_{P12BL} was positively related to *all*

participants' liability decisions (b = .92, se = .39, p = .018); however, for cases in the determinate legal categories, the relationship between RPW_{P12BL} and all participants' liability decisions was not significant (b = -.35, se = .44, *p* = .423).

Secondary Analysis: Legal Accuracy and Decision Confidence

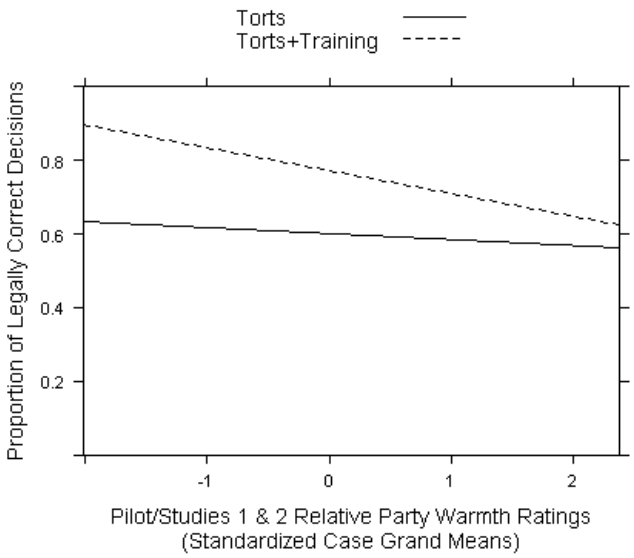
With respect to the secondary dependent measures, using binomial-probit and linear mixed effects models, respectively, to control for the lack of independence in participant-responses and cases, Legal Accuracy and Decision Confidence were each regressed on RPW_{P12BL}, Training, Transfer, and Legal Category Indeterminacy, as well as the higher-order interactions among them. Of interest here, for Legal Accuracy, the interaction between RPW_{P12BL} and Training was significant. Omitting the higher-order interactions did not alter this result. Specifically, as indicate in Table 33, for participants

Table 33: Effects of Relative Party Warmth and Training on Legal Accuracy in Study 3

Predictor / Factors (Computation / Levels)	**df**	**Chi-Squared**	***p*-value**	**b**	**se**	***p*-value**
Intercept				.29	.14	.034
RPW_{P12BL}	1	1.02	0.311	-.05	.13	.728
Training (Trg)	1	48.87	<.001	.60	.07	<.001
RPW_{P12BL} x Trg	1	4.77	0.029	-.15	.07	.027
Notes: Ps = 77, N = 1842.						

with Training, RPW_{P12BL} was significantly negatively related to Legal Accuracy, such that their liability decisions conformed less to those of the judges in the underlying cases when plaintiffs were rated to be relatively warm compared to Defendants, but more when defendants were considered to be warmer. RPW_{P12BL} did not relate to Legal Accuracy for participants without Training. Figure 12a illustrates the effect.

Figure 12a: Effects of Relative Party Warmth and Training on Legal Accuracy in Study 3

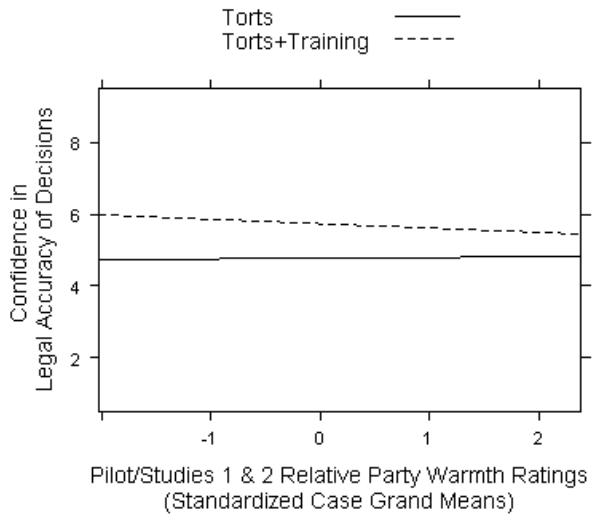


A similar result was found for participants' decision confidence, for which Training and the RPW_{P12BL} x Training interaction were both significant predictors (see Table 34). As in the prior studies, participants who completed training in the study were significantly more confident that their decisions were legally accurate than were those who did not receive training. However, confidence was reduced to the extent that RPW_{P12BL} increased.

Table 34: Effects of Relative Party Warmth and Training on Decision Confidence in Study 3			
Predictor / Factors	***F*-value**		***p*-value**
RPW_{P12BL}	.43		.510
Trg	34.51		<.001
RPW_{P12BL} x Trg	4.57		.033
	b	**se**	***p*-value**
(Intercept)	4.78	.16	<.001
RPW_{P12BL}	.02	.11	.874
MTrg	.96	.16	<.001
RPW_{P12BL} x MTrg	-.14	.06	.033
Simple Slopes			
Training Condition	NoTrg		Trg
(Intercept)	4.78^{***}		5.74^{***}
RPW_{P12BL}	.02		-.12
Notes: Ps =77, N = 1841.			

Figure 12b illustrates the result.

Figure 12b: Effects of Relative Party Warmth and Training on Decision Confidence in Study 3



Study 3 discussion

The results of Studies 1 and 2 provided consistent and strong support for the conditional ability of individuals who have learned situation categories to avoid using social categories in judgment and decision-making. Study 3 extended the results by testing the predictions of CCAM in a sample with naturalistic training and expertise and psychological characteristics closer to those of individuals who practice law. Again the results support Hypothesis 5: That participants who are trained in situation categories should be able to avoid the use of stereotypes; however, their ability to do so will be attenuated by indeterminacy in the relevant situation category. Specifically in Study 3, whether trained during the experiment or having only taken a course in tort law, all participants *were* able to avoid the use of social categories when deciding cases that fit into a legal category that determined the case outcome (i.e., ultra-hazardous activity or no affirmative duty cases). Even so, neither group was able to do so for negligence cases, the decision rule for which requires secondary judgments before a liability decision can be made.

As predicted by CCAM, based on these results we would expect lawyers, judges, and other graduates of law school to be able to make socially un-biased judgments about legal cases that could be decided as a matter of law (i.e., those with a determinative legal rule). However, for cases in legal categories that required judgments of fact (e.g., whether a person acted reasonably, or credibility judgments regarding competing testimony), the standard social-cognitive predictions are likely to hold: Social bias would

impact the judgments of legal experts to a similar degree as with the judgment of lay legal decision-makers, such as jurors.

In addition, unlike the results of Studies 1 and 2, in Study 3 training had no affect on participants' stereotype when deciding cases that required some transfer. Further, the pattern of decisions in these cases for law students was very similar to that obtained for trained participants in the same conditions in Studies 1 and 2. This result suggests that, at least with respect to the impact of learning legal rules on the use of social categories, the analogical encoding training technique used in the three studies effectively replicated the effects of taking a course in law school.

To estimate the effect size of the results in Study 3, the odds that participants' liability decisions were consistent with the use of social stereotypes were again computed as in Studies 1 and 2. Table 35 provides the odds, as well as the odds ratios between, the major conditions of interest. In contrast to Studies 1 and 2, given that all of the participants in Study 3 were to some degree trained in tort law, there is no meaningful baseline. For those in the torts only condition, the odds that a liability decision was consistent with the use of social stereotypes in the determinate category cases was close to 1 (i.e., .96, or 24-to-25), suggesting no use of stereotypes. By comparison, the odds for cases in indeterminate legal categories in the untrained sample were 1.66, or 5-to-3. For participants with training, in the Determinate Legal Category the odds again hovered around 1: .90 or 9-to-10. For indeterminate legal categories, the odds varied across transfer from approximately 1 in the No Transfer condition to 2.03, or 2-to-1 in the Near Transfer condition.

Table 35: Study 3 Liability Decision Effect Sizes						
	NoTrg LCD	**NoTrg LCI**	**Trg LCD**	**Trg LCI NoTrs**	**Trg LCI NrTrs**	**Trg LCI FTrs**
Odds of Liability Decision Conforming to RPW_{BL} Prediction	.96	1.66	.90	.96	2.03	1.83
	Odds Ratios					
NoTrg LCD	1	.58	1.07	1.01	.48	.44
No Trg LCI	1.72	1	1.84	1.73	.82	.75
Trg LCD	.94	.54	1	.94	.44	.41
Trg LCI NoTrs	.99	.58	1.06	1	.47	.43
Trg LCI NrTrs	2.11	1.22	2.25	2.12	1	.92
Trg LCI FTrs	2.29	1.33	2.45	2.30	1.09	1
Notes: Odds ratios above the diagonal are vertically listed conditions/horizontally listed conditions with; odds ratios below the diagonal reflect the inverse pattern.						

Combined analysis

Studies 1, 2, and 3 represent incremental extensions of the tests of the core CCAM predictions in samples with increased training in situation categories. Use of the same sample cases across the three studies allows for a direct comparison of the differences between trained and untrained participants in their reliance on social categories in making legal decisions. The increased statistical power from aggregating across studies also enables additional descriptive analysis into the effects of training at reducing bias in decision-making. In particular, by conceptualizing the cases as items, a two-parameter item response theory model of each can be estimated, the response functions for which illustrate the pattern of bias reduction produced by training for individuals across the range of propensity for bias. Finally, for purposes of comparison, this section collects the odds that the outcomes of liability decisions were consistent with the use of social categories for all of the major conditions across the three studies.

Impact of Training, Transfer, and Indeterminacy.

The effects of training, whether in the study or in the form of a torts class, on stereotype use appear to be very consistent across the three studies. So too with the moderating impact of transfer and legal category indeterminacy. To directly test the consistency of the effects of training, transfer, and indeterminacy factors, the data from the samples in Studies 1, 2, and 3 were combined into one file and the primary analysis rerun on the combined data using two different training factors. The first is a six-level Training factor representing each of the possible training conditions: No Training (Study 1 and 2 Control Conditions), LCD Training (Study 1 Training Condition), LCI Training (Study 1 Training Condition), Full Training (Study 2), Torts (Study 3 Control), and Torts Plus Training (Study 3 Training Conditions). The second is a two-level Training factor that differentiates only between decisions on which participants were trained in a relevant legal category or not. Table 36 breaks down the decisions in the combined analysis by each of the factors. To the extent that the effects of training is the same across studies,

Table 36: Number of Decisions in Combined Analysis by Study Number, Assigned Condition, and Legal Training

Study Number		1 & 2	1	1	2	3	3	
Assigned Condition (Six-Level Training Factor)		No Trg	LCD Trg	LCI Trg	Full Trg	Torts	Torts & Full Trg	Row Totals
Legal Category Training (Two-Level Training Factor)	Trained	0	252	249	1390	672	1173	3736
	Not Trained	1296	252	252	0	0	0	1800
Column Totals		1296	504	501	1390	672	1173	5536

the model with the two-level training factor should fit as well or better than the six-level training factor. Further, the effects of training, transfer, and indeterminacy, as well as their interactions, should remain significant in both models in the combined analysis.

The results, given in Table 37 support the consistency of results across studies. In particular, a comparison of the chi-square and BIC in the test of model fit shows that although the two models are not identical, the two-level Training Factor model is more parsimonious, requiring estimation of far fewer parameters (48 less) and having a lower BIC. Also, examination of the *F*-values for each model suggests that the primary difference between them relates to the three-way interaction among RPW_{PBL}, Training, and Legal Category Indeterminacy, which is significant in the six-level Model but not in the two-level model. Even so, in both models, the three-way interaction is qualified by the primary interaction of interest for testing CCAM: A highly significant four-way interaction among all predictors.

Examining the primary slopes of interest, collapsing across conditions, RPW_{PBL} was a significant positive predictor of liability decisions of participants who had not learned situation categories that were applicable to the case examples (b = .53, se = .15, $p < .001$). By comparison, RPW_{PBL} was not significantly related to the liability decisions of participants with situation categories for cases that fit a Determinate Legal Category (b = -.21, se = .48, $p < .658$). Finally, for the liability decisions of participants with situation categories deciding cases that fit an indeterminate legal category, the significance of RPW_{PBL} depended upon the level of transfer: No Transfer (b = -.91, se = 2.49, $p = .716$),

Table 37: M7 (Liability Decision)

	Six-Level Training Factor			Two-Level Training Factor		
Predictor / Factors (Computation / Levels)	**df**	***F*-value**	***p*-value**	**df**	***F*-value**	***p*-value**
RPW_{P12BL}	1	.19	.665	1	.18	.668
Training (Trg)	5	1.34	.245	1	1.8	.18
Transfer (Trs)	2	.27	.766	2	.26	.77
Legal Category Indeterminacy (LCI)	1	.04	.846	1	.04	.847
RPW_{PBL} x Trg	5	13.47	<.001	1	74.37	<.001
RPW_{PBL} x Trs	2	.11	.9	2	.1	.902
Trg x Trs	10	6.12	<.001	2	11.89	<.001
RPW_{PBL} x LCI	1	.52	.47	1	.51	.474
Trg x LCI	5	6.6	<.001	1	14.21	<.001
Trs x LCI	2	.01	.994	2	.01	.995
RPW_{PBL} x Trg x Trs	10	3.51	<.001	2	6.61	.001
RPW_{PBL} x Trg x LCI	5	7.05	<.001	1	.26	.611
RPW_{PBL} x Trs x LCI	2	.51	.602	2	.5	.607
Trg x Trs X LCI	10	3.55	<.001	2	8.44	<.001
RPW_{PBL} x Trg x Trs x LCI	10	3.19	<.001	2	11.33	<.001

Model	**df**	**AIC**	**BIC**	**Log Likelihood**	**Chi-Squared**	**df**	***p*-value**
Two-Level Training	27	24565	24744	-12256			
Six-Level Training	75	24525	25022	-12188	135.84	48	<.001

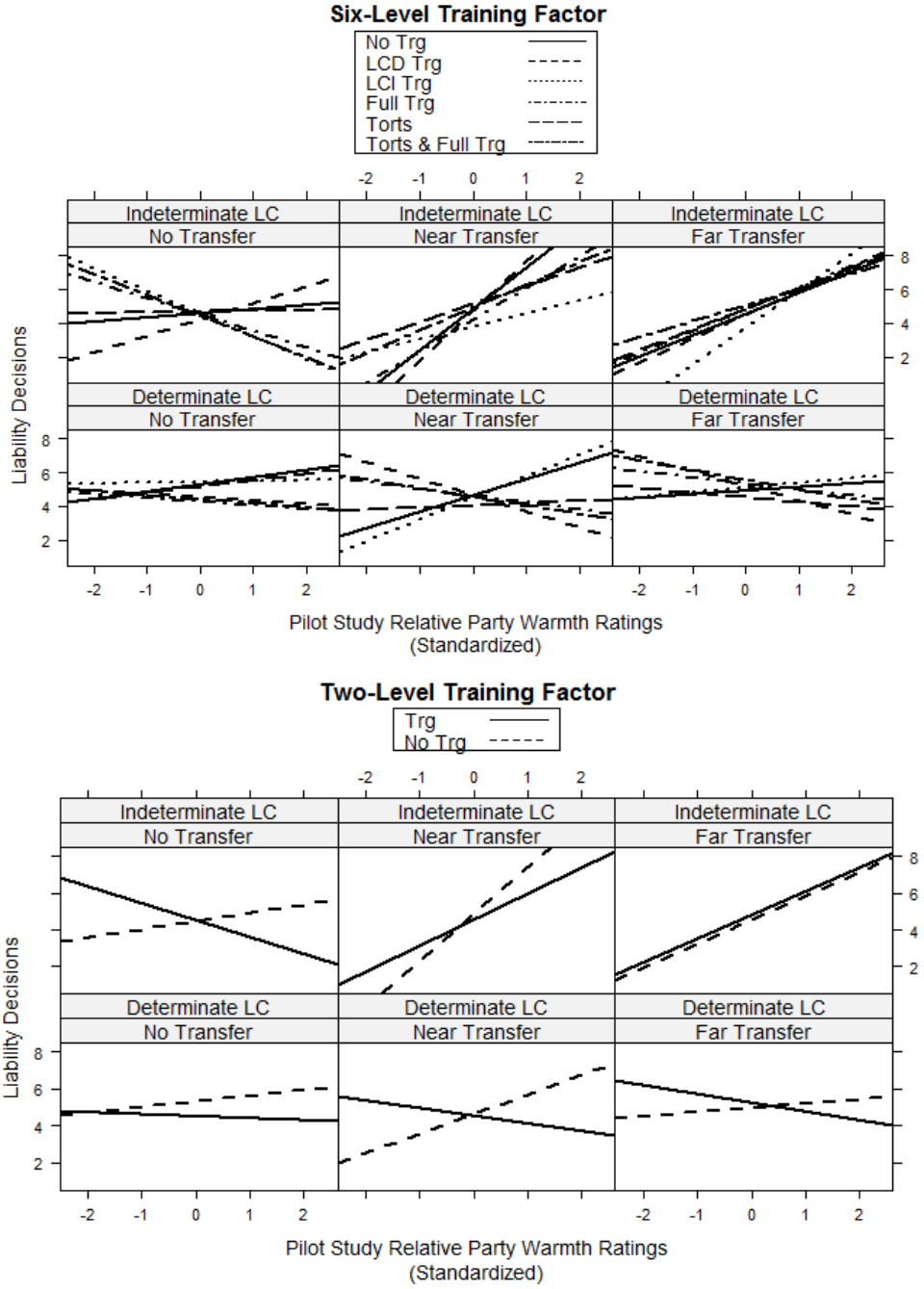
Notes: Ps = 232; N = 5522.

Near Transfer (b = 1.39, se = 3.05, p = .650), and Far Transfer (b = 1.27, se = .11, p = .023).[26] The very high standard errors in the indeterminate legal category estimates imply that the trained participants in these conditions were not uniformly applying situation or social categories to decide the cases in this category.

The comparison between six- and two-level Training-factor models and overall similarity in the pattern of results is depicted in Figure 13. Ultimately, the two-factor

[26] *P*-value for Far-Transfer Condition is estimate from Monte-Carlo simulation, as that estimate is substantially higher than calculation from t-value would suggest (i.e., $p < .001$).

Figure 13: Affect of RPW_{BL} on Liability Decisions by Type of Training for Each Condition Combined for All Studies



model is arguably the better fitting; however, the choice of model does not alter the ultimate conclusion that the overall result consistently support Hypothesis 5.

Underlying variation in stereotype use

The primary results from the three studies and combined primary analysis above directly address two of the three major theoretical elements of CCAM: (1) the depth of encoding of the situation categories and (2) the indeterminacy in the implications of those categories. The third element, variation in the comparative strength of social category activation, has been addressed only indirectly in two ways. The first is the comparative estimates between negative-transfer and implicit stereotyping research. The comparison suggests that automatic use of social stereotypes may be pervasive, but likely not the result of excessive over learning and thus not especially robust to the presence of alternatives frameworks for categorizing a situation. Second is a discussion of the potential for individual differences in participants' levels of Motivation to Control Prejudice to moderate the effects of RPW_{BL} on liability decisions. However, as with other individual differences, this was not found to be significant in any of the samples. Repeating the individual differences analysis in the combined sample by regressing Liability Decisions on the four standard predictors plus the motivation to control prejudice, as well as the interactions between them, yields the same result. Notwithstanding having a combined sample size of over 5,500 decisions, no term containing the Motivation to Control Prejudice and RPW_{BL} was significant (all $p > .118$).

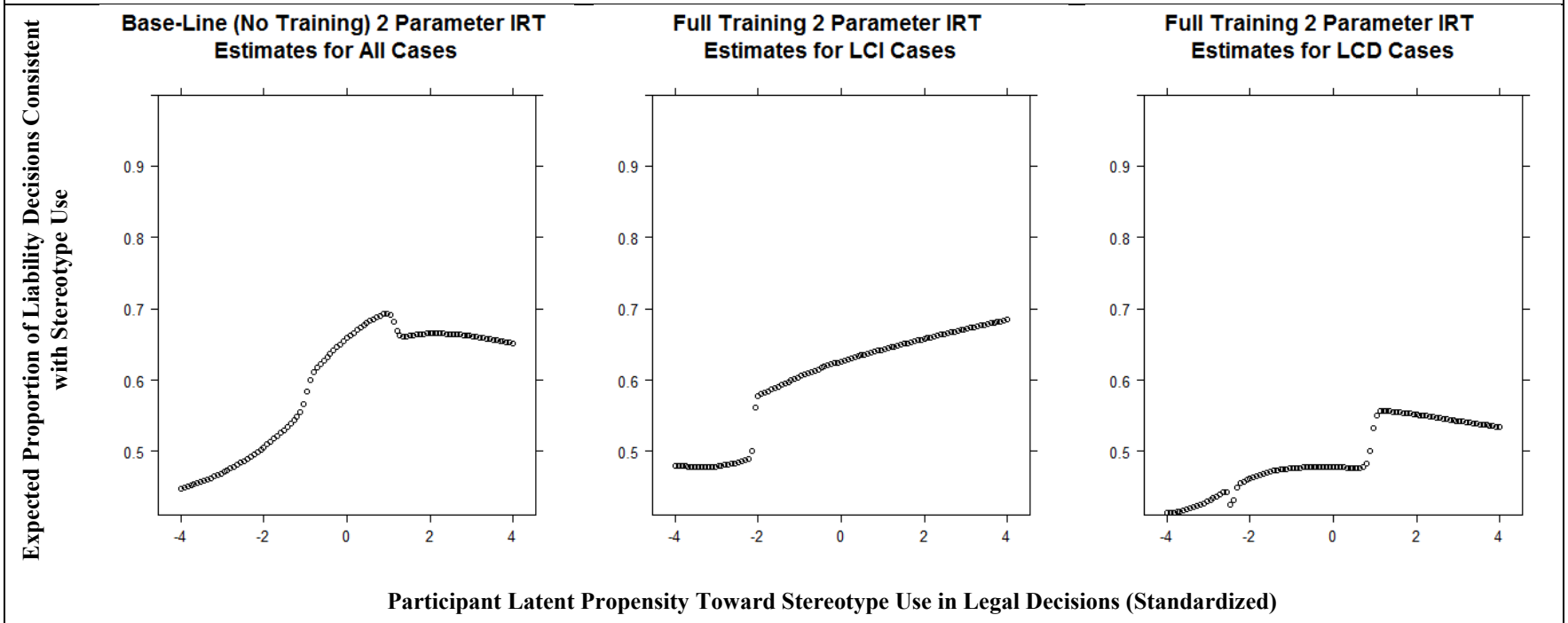
The statistical power from the combined sample permits a third approach for understanding how variation in propensity towards stereotype use, whether the result of individual differences or situational factors like accessibility, might affect the results of the three studies. In this analysis, Item Response Theory (IRT; see e.g., de Ayala, 2009)

was used to estimate how the availability of situation categories impacts the use of social categories across the range of observed variation in participants' propensity to use stereotypes in their decision-making.

IRT is an approach to psychological measurement that involves estimating and modeling the latent trait of an individual, and the characteristics of the items used to assess those traits, using the same scale. Thus, for example, if one is constructing a standardized test of mathematical ability, given a sufficient number of responses to set of mathematical problems, IRT can be used to estimate the difficulty, discrimination, and possibly other parameters of each of the problems. The parameters for a given problem, in turn, indicate what a correct or incorrect answer to the problem tells us about an individual's ability. Using this information, math problems can be selected to create a test that assesses particular ranges of mathematical ability, which can be depicted by plotting a test information function.

Here, each of the legal case examples is like a mathematical problem. Given participants' liability judgments, the difficulty and discrimination of each of the cases as a measure of a latent tendency to stereotype can be estimated. The combined estimates can then be used to depict how the cases function to assess the range of stereotyping in that sample of participants. To do this, as with the odds calculations, the liability decisions of participants in either the Full Training or No Training conditions were transformed into an indicator code for whether they were consistent with the use of social stereotypes (1 = consistent, 0 = inconsistent). Using the irtoys package in R (R Development Core Team, 2011), a two-parameter IRT model was fit for each case

Figure 14: Profiles of Social-Psychological Space of Participants in Selected Combinations of Training and Legal Rule Indeterminacy



Note: Because of orthogonal Social Liability x Legal Liability design, in the absence of stereotype use, the expected proportion of liability decisions that would be consistent with stereotype use is .5.

separately for the two conditions based upon the transformed responses to it. These were then used to construct Test Information Functions for cases and participants in the conditions. The resulting functions, shown in Figure 14, depict the expected proportion of liability decisions that are consistent with social category use across the range of a latent variable representing participants' underlying propensity to use social categories in deciding the sample cases.

As indicated in the left-most cell of Figure 14, across cases, an individual with an average propensity toward using social categories is expected to decide approximately 67% of cases in a way that is consistent with social category use. This is approximately the same percentage as for individuals one standard deviation below and two standard deviations above the mean. By comparison, those participants two standard deviations below the mean are expected to make decisions in a way that is not related to the social categories of those involved. The results for trained individuals deciding indeterminate legal category cases, depicted in the middle cell, is similar for individuals with average or high propensity to use social categories, and actually higher than base-line for individuals between two and one standard deviations below the mean. Finally, as depicted in the right cell of Figure 14, for trained individuals deciding cases in the determinate legal categories, the expected proportion of decisions that is consistent with the use of social stereotypes varies from approximately 45% to 50% for the entire range between minus two and plus one standard deviations, increasing to approximately 57% for higher propensities toward use of social categories.

Biased outcomes. In terms of the effect sizes for biased decision outcomes, Table 38 collects the odds that a case would be decided in a way that was consistent with the use of social categories for each of the major conditions in all three studies. In the Table, the cases that Hypothesis 5 of CCAM predicts should not be influenced by social categories are shaded. The range of odds for these cases is .84 to 1.11, or approximately from 5-to-6 to 10-to-9. By comparison the odds that a decision is consistent with social category use in those conditions that CCAM's Hypothesis 5 predicts would be affected by social categories range from .68 to 5.76. Dropping the two extremes (both of which occur in the Training x LCI x Near Transfer condition) the odds range is 1.57 to 3.42, or approximately 3-to-2 to 7-to-2 that a liability decision would be consistent with social stereotypes and thus favor the warmer party, as indicated by a sample of untrained, independent raters.

Table 38: Odds of Liability Decisions Conforming to RPW_{BL} Prediction Compared Across Studies

	NoTrg LCD	NoTrg LCI	Trg LCD	Trg LCI NoTrs	Trg LCI NrTrs	Trg LCI FTrs
Study 1	1.57		.84	.98	.68	3.42
Study 2	1.61		1.05	1.11	5.76	2.21
Study 3	.96	1.66	.90	.96	2.03	1.83

Notes: Shaded cells reflect conditions under which CCAM predicts liability decisions will not be influenced by social categories.

Exploratory Analysis: Individual Differences and Training Effectiveness.

Prior research on learning has found that certain individual differences, including self efficacy, conscientiousness, and motivation, relate to the depth of encoding of categories (see n. 7). However, analysis of responses in each of the individual studies showed that measures of these traits did not moderate the effects of the interaction

between training and transfer on the accuracy of liability decisions. Testing them again in the aggregated sample produced a similar result. Only self efficacy (in interaction with training) was significantly related to the legal accuracy of participants' decisions (b = .23, se = .08, p = .004). In particular, simple slopes analysis showed that self efficacy was weakly positively related to decision accuracy among trained participants (b = .08, se = .04, p = .020), but weakly and negatively related among those without training (b = -.09, se = .04, p = .043).

Exploratory analysis: Party Competence

In addition to the warmth ratings of each party that were combined to create the RPW_{BL} measures, participants also completed four-item (Studies 1 and 2) or one-item (Study 3) measures of the competence of each party. Although the SCM has clear predictions for the effects of perceived warmth (i.e., assist the party with the higher warmth rating), its predictions for the effects of perceived competence (i.e., act actively or passively) in the context of legal decisions are less clear. To test the effects of party competence compared to party warmth, the liability decisions of individuals without

Table 38: Comparison of the Relationship Between Perceptions of Party Warmth and Party Competence on Liability Decisions

	df	*F*-value	b	se	*p*-value
Intercept			4.84	.15	<.001
Plaintiff Warmth	1	163.07	.37	.07	<.001
Defendant Warmth	1	124.54	-.30	.07	<.001
Plaintiff Competence	1	42.96	.42	.07	<.001
Defendant Competence	1	69.53	-.59	.07	<.001

relevant training were regressed on the standardized warmth and competence ratings for each party, as always, using a mixed-effects model to control for lack of independence in participants and cases. The result, shown in Table 38, suggests that although the direction of the effects are the same for perceptions of party competence as for perceptions of warmth, the former may actually be the stronger predictor of liability decisions.

Chapter V: General Discussion

Social-cognitive theory

Social-cognitive models typically explain race, gender, and other social biases in terms of the automatic, natural, and often necessary use of social categories when trying to understand and respond to a given situation (Fiske & Taylor, 2008). In order to compensate for the profound complexity of the world, we construct networks of categories for uniquely associated or repeatedly paired stimuli, their characteristics, and implications. Social categories, such as race, gender, age, and occupation, along with the stereotypes and attitudes we associate with them, are the network of categories that we employ. Social categorization thus provides us with a basis for understanding the meaning of the people in a situation (e.g., friend or foe, able or inept) and formulating a response, however generalized and inaccurate, while conserving scarce cognitive, attentional, and behavioral resources (Allport, 1954; Fiske & Taylor, 2008).

Much of existing social-cognitive theory of social bias juxtiposes effortful individuation against automatic categorization. Dual-process and dual-system models (Chaiken & Trope, 1999; Evans, 2008; Kahneman, 2011; Kruglanski & Orehek, 2007; Smith & DeCoster, 2000) embody the notion that social categorization affects decisions most "when a perceiver lacks the motivation, time, or cognitive capacity to think deeply (and accurately) about others" (Macrea & Bodenhausen, 2000, p. 105; Fiske & Taylor, 2008). Further, the idea that people avoid or attenuate social bias primarily by expending the resources necessary to gather individuating information and to think deeply about

others forms the foundation for much of the theory and research on the reduction of stereotyping as well as some of the most prominent debates about the extent of bias in, for example, legal and employment settings. In these debates, each side frequently builds its case by pointing out research results showing the automaticity of bias or structural factors, such as accountability and other accuracy incentives, that lead people to use either cognitively efficient social categories, and thus make biased decisions, or cognitively expensive individuating information, and thus do not.

The Competing Category Application Model (CCAM) adopts a different approach. Rather than equating categorization with social bias, the model predicts that categorization may also reduce it. Research on perception, learning, and expert decision-making, as well as the results of some isolated social-cognition studies, together suggest that, with training and experience, people can develop networks of categories for large bundles of stimuli, even entire situations (Chase & Simon, 1973; Gobet & Simon, 1998; Klein, 1998). In doing so, the experts learn to focus on diagnostic feature of the situation while ignoring those that are unrelated to the task for which they are trained. Drawing on these findings, CCAM predicts that, if decision makers learn networks of categories for social situations (e.g., legal rules) that are facially unrelated to the social categories of those involved, then they can use the situation categories to efficiently understand the situation and formulate a socially unbiased response without expending the effort necessary to collect and consider individuating information. Thus, a judge who can understand a car accident by categorizing it in terms of a particular law that determines who is liable should be no more influenced by the race or gender of the drivers than a

chess master is by the design details of his pieces when responding to a common opening move. Both are unnecessary for their understanding of what to do in the situation.

Under CCAM, the extent to which situation categories will be used in place of social categories is primarily a function of three elements: (1) The *depth of encoding* of the situation categories (i.e., whether they were learned in a way that facilitates transfer to a wide range of situations), (2) the *accessibility of relevant social categories* (i.e., whether, in light of individual differences and other social-cognitive features of the situation such as cognitive load, to ignore the social categories of those in the situation), and (3) the *indeterminacy of the implications and responses associated with the relevant situation categories* (i.e., whether recognizing that a situation fits a category results in a specific response or prompts a discretionary one).

The results of Studies 1, 2, and 3 call into question the adequacy and general applicability of the standard social-cognitive models of bias for judgments about which individuals have prior training and expertise. With respect to the overall effects of stereotypes on judgments, the liability decisions of participants who had not learned relevant legal rules for categorizing and deciding a case were entirely as predicted by the SCM. Those participants determined whether defendants should be liable to plaintiffs in a way that was consistent with the general, socially-shared understanding of the situation embodied in the independent ratings of the warmth of the parties by an untrained sample: Irrespective of the correct legal outcome, parties that were considered to be higher in warmth by the independent raters tended to receive favorable decisions. So too for individuals who had learned indeterminate legal rules for cases to which the

indeterminate legal rules applied. In contrast, the predictions of the SCM regarding the effects of a socially-shared inference of stereotypic warmth did *not* hold for participants who had been trained to understand the cases without resorting to social categories, so long as the situation categories available to do so were associated with a specific outcome (i.e., determinate). For these participants in this situation, independent ratings of the warmth of the parties were not associated with liability decisions.

The ability of participants who had learned determinate legal rules to avoid using social categories in a task that theoretically involves complex social judgments concerning causation, fault, and liability for injury represents a substantial extension beyond the limited findings of existing social-cognitive research concerning the ability of instructions to identify stimulus (e.g., dots) to attenuate bias. Moreover, given that legal accuracy declined across the levels of transfer *with no corresponding increase in social category use*, the results suggest that the ability to avoid applying social categories is not merely the result of a reduction of available variance from accurate decision making. Instead, the act of using relevant, determinate categories may itself be a more constrained cognitive process. Future research on this effect is needed.

The predictions of existing theory about the ability of incentives or other accuracy motivations to attenuate bias in judgments fared poorly as well. Participants in Study 1 were told that they could earn an additional $40 if their liability decisions were among the most legally accurate. Nevertheless, their judgments on cases for which they had not been trained in the legally relevant category were as affected by base-line ratings of party warmth as those of participants in the control group. In addition, in near- and far transfer

cases, participants in Studies 1, 2, and 3 who were trained in indeterminate legal rules often made liability decisions that were actually more strongly related to RPW_{BL} than the decisions of participants in the control conditions, again despite the offer of an incentive for accuracy.

By comparison, the results of Studies 1, 2, and 3 provide strong support for the importance of the main elements of CCAM, as articulated in Hypothesis 5. Hypothesis 5 predicted that, although training in situation categories would reduce judgmental bias that results from use of social categories, the greater the indeterminacy of a situation category, the lower training effectiveness at reducing social-cognitive bias. Thus, individuals who have learned determinate situation categories should be able to successfully apply them and avoid using social categories across the range of transfer. However, those who have learned indeterminate categories will only be able to successfully apply them instead of social categories in situations in which the surface features are identical, or bear a strong resemblance to, those from verified prior experiences (i.e., those situations where the correct response is known from training and, thus, recognition of the situation is effectively determinate).

So it was with participants' liability decisions on the case examples used here. Consistently across three studies, participants who were not trained in legal categories decided whether defendants should be liable to plaintiffs in a way that was consistent with the general, socially-shared understanding of the situation embodied in the independent ratings of the warmth of the parties by an untrained sample – an indication that the SCM applies to decisions in the legal domain. Similarly, across the studies,

participants who were trained in determinate legal categories made liability decisions in cases that fit those categories in a way that was not related to the lay perceptions of the relative warmth of the parties – an indication of the added utility of CCAM in this domain. Finally, across the studies, whether the decisions on indeterminate-legal-category cases of participants with relevant training were consistent with the independent perceptions of the relative warmth of the parties depended upon the extent of transfer. When the correct legal outcome of the case was known from training (i.e., in the No Transfer condition), results suggest that the participants avoided the use of social categories. However, often in cases that shared surface features with the examples used in training and always in cases that did not, trained participants' liability decisions were actually *more strongly related* to the base-line warmth of the parties in the case than the decisions of participants who were not trained at all.

Why would training or expertise exacerbate bias? Building on the HSM's *additivity* and *attenuation hypotheses*, CCAM's Hypothesis 5 proposed that because indeterminate situation categories require additional interpretation, when the implications of social and situation categories are congruent, they may magnify each other's effects, thereby producing more extreme judgments. If correct, in Studies 1, 2, and 3, this would occur when the implications of RPW_{BL} and legal liability in the underlying case were the same. Given the design, this is effectively a significant interaction between RPW_{BL} and legal liability for trained participants deciding indeterminate legal category cases in the Near and Far Transfer Conditions. Post-hoc analysis in the combined sample, however,

showed that this interaction was not significant.[27] Accordingly, the results do not support this component of Hypothesis 5.

An alternate explanation for the increased use of social categories in the liability decisions by trained individuals applying indeterminate situation categories is social judgeability (Yzerbyt, Schadron, Leyens, & Rocher, 1994). Yzerbyt et al. (1994) hypothesized and found that individuals generally wish to avoid being biased or at least to avoid the appearance of being biased, and thus will hesitate to judge others if it appears that they have no information aside from that person's race or gender. However, when individuals feel that there is a legitimate basis for judging someone else but that basis is actually lacking, then they are not on guard for bias and thus are more prone to the use of stereotypes in their judgments, and more confident in those judgments, than are those who believe that they lack such information.

In CCAM terms, having learned indeterminate situation categories may have the same effect, effectively giving participants permission and the confidence to judge others without the corresponding resources necessary to avoid using social stereotypes when doing so. A post hoc analysis of participants' confidence in the legal accuracy of their judgments in indeterminate legal category cases provides some support for this explanation of the stronger effect of stereotypes on decisions for cases in the near- and far-transfer conditions. In particular, participants in these conditions were significantly more confident that their decisions were legally accurate than participants without training.[28] Moreover, as one would expect were the effect inversely related to

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[27] Relevant interaction regression coefficient = -.55, se = 1.27, p = .666.

[28] NrTrs: b = .52, se = .15, p = <.001; FTrs: b = .42, se = .15, p = .006.

participants' concern about being biased, participants' motivation to control prejudice reduced participants' confidence less when they were trained than when they were not.[29] Given these results, a more direct assessment of the social judgeabilty explanation for the ability of indeterminate situation categories to exacerbate bias may be a promising topic of future research.

Learning theory and expertise. The results of the training manipulation checks in Studies 1, 2, and 3 are also mostly consistent with existing learning theory. As shown in Table 39, participants with training were overwhelmingly able to apply the rules presented in the guided analogical encoding training to accurately decide cases that were identical to those in the training as well as those that shared surface features with the training cases (i.e., the near transfer cases). Far fewer were able to do so in response to cases that shared no surface feature with those included in training (i.e., the far transfer cases). Even so, the higher accuracy rate for trained participants in the Far Transfer condition suggests that the guided analogical encoding format may have been successful in getting at least a few of the participants to encode the legal rules deeply.

Table 39: Percentage of Liability Decisions that were Legally Accurate Aggregated Across Studies

	No Transfer	Near Transfer	Far Transfer
No Training	56%	53%	49%
Training	89%	76%	58%

Further, CCAM's recognition of the importance of transfer in the ability of learned decision rules to displace defaults provides a way to reconcile some of the inconsistencies in findings between this literature and that concerning expertise and bias

[29] NrTrs | Training x IMCP: b = .26, se = .16, p = .082; FTrs | Training x IMCP: b = .29, se = .16, p = .081.) The Monte-Carlo simulation estimate of p-values for the interaction in NrTrs and FTrs conditions are both significant (p = .030). IMCP was not significantly related to participants' liability decisions.

resulting from judgment heuristics, as well as inconsistencies within the judgment heuristics literature itself. For example, using a research paradigm that relied upon expert-participants' prior training and experience, Tversky & Kahneman (1983) found that experts are often unable to apply general decision rules to avoid using heuristics in judgments facially related to their domains of expertise. Training participants themselves, however, Nisbett and colleagues' (for reviews see Nisbett, 2009; Nisbett, Fong, Lehman, & Cheng, 1987) showed that learned rules can reduce the effects of judgment bias from such heuristics. To the extent that the judgment task in the studies matched the surface features of the training conducted by Nisbett and colleagues but was dissimilar to those of the actual judgment tasks typically performed by the experts in Tversky and Kahneman's studies, CCAM would predict that the learned rules would be more effective at displacing alternatives in the former than the latter because application of naturalistic expertise required more transfer than the application of in-study training on a very similar task.

The results of the studies here are inconsistent with prior research suggesting that individual differences have a substantial affect on the depth of encoding. Reliable measures of participants' self efficacy, conscientiousness, and motivation to succeed in the study, as well as estimates of their cognitive abilities from standardized test scores, did not predict the extent to which they were able to transfer their learning.

The results are also generally consistent with theory regarding the ability of expertise to constrain judgments to relevant information. As Haider and Frensch (1996, 1999) would likely have predicted, across the studies, the liability decisions of

participants who had been exposed to relevant legal rules suggest that they were able to effectively ignore the stereotypes associated with the social categories to which the parties belonged. Further, and most provocatively, participants were able to do so even when their judgments were not especially accurate. This suggests that, under at least some circumstances, the ability of experts to reduce the amount of irrelevant information they consider may not be coextensive with their ability to identify and appropriately weigh relevant information. Again, more research is necessary to investigate this possibility.

Shortcomings. Underlying the results is CCAM's fundamental proposition that reduction in bias occurs whenever individuals' training or expertise supplies a network of domain-specific categories that enable them to understand the meaning of a situation and respond to it without resorting to default social categories. Supporting the proposition, the effects of training and category indeterminacy did not differ irrespective of whether participants were trained in one (Study 1) or many legal rules (Studies 2 and 3), whether participants were otherwise unfamiliar with the situation categories (Studies 1 and 2) or had prior experience with them (Study 3), and whether knowledge of the categories and their implications came from the training provided (Studies 1, 2, and 3) or from a relevant course in a professional school (Study 3).

Despite the general support for CCAM, the studies reported here have several inferential shortcomings. Most significantly, the studies were designed primarily as an experimental test of the effects of the availability of situation categories on use of social categories across samples with a range of difficulty and ability learning, retaining, and

applying the categories. Accordingly, other factors, such as the indeterminacy of the legal categories and transfer, were not experimentally varied. Thus, the results of the analyses with respect to those factors are correlational, and may have been affected by idiosyncratic features of the particular legal rules selected or case examples used. So, for example, it might be that the secondary judgments about reasonableness necessary to decide cases in the negligence legal category make the categories indeterminate and facilitate use of social categories but that seemingly indeterminate judgments central to tasks like making hiring decisions (e.g., deciding whether a candidate is professional) may operate differently vis-a-vis social categories.

Similarly, because of the complexity of the hypothesized four-way interaction, and in order to be able to generalize the effects to a broad range of social categories, the extent to which participants' decisions were biased was not assessed through the systematic, between-participants, experimental manipulation of the race, gender, or other social category membership of parties to the cases. Rather, the base-line social predictor analysis method used here relies upon existing work under the SCM. The results of that research show that the effects of social stereotypes on behavior is mediated by socially-shared associations between social categories and levels of warmth. Although the results of the Pilot Study, subsequent manipulation checks, and the decisions of untrained participants supported the predictions of the SCM, it is nevertheless likely that the ratings of party warmth were affected by more than simply the social categories of those parties. To the extent that perceptions of warmth fully mediate the effects of stereotypes, this does nothing to detract from the findings. However, to the extent that social stereotypes

impact judgments in a way that is not captured by base-line warmth ratings, the ability of training to reduce those affects was not tested here.

Finally, although the results of Study 3 suggest that the findings here generalize to different populations, the training, samples, and judgment tasks used in the studies were necessarily just laboratory approximations of the social-psychological space of those with naturalistic training and experience making real-world judgments in their domain of expertise. Follow-up studies will seek to address this shortcoming through conceptual replication of the studies in other types of judgments common in the legal system (e.g., jury selection), samples with more naturalistic experience (e.g., judges and practicing attorneys), and members of other professional domains (e.g., human resources managers making hiring, promotion, and termination decisions). Converging results from such studies would provide very strong support for CCAM as a general model of the extent and conditions of stereotype use in expert judgments.

Interdisciplinary model, model for interdisciplinarity.

Interdisciplinary scholarship has received a great deal of attention in recent years from funding agencies like the National Science Foundation (NSF, 2012), commentators, and the academy itself (Van Lange, 2006). Not all interdisciplinary scholarship is the same. In his discussion of Political Psychology, an inherently interdisciplinary field, Krosnick (2002) notes that most if not all of the work in the area involves importing insights and methods from psychology to address political science questions. So too with social cognition in law (see Borgida & Girvan, 2013). Indeed, although psychological insights are frequently exported its insights to other fields (see e.g. Druckman, Kuklnski,

& Sigelman, 2009; Borgida & Girvan, 2013; Girvan & Deason, 2013; Girvan, 2009), very little intellectual commerce runs in the opposite direction.

CCAM, which was built into not out from psychology, is an exception to this rule. The intellectual lineage of its core insight that professional training generally, and legal education in particular, is capable of reducing social bias can be traced directly to classic political and jurisprudential theory. Moreover, the indeterminacy element in the model is a generalization of a fundamental distinction in the legal system between "questions of law," which judges decide, and "questions of fact," which are given to juries. Thus, it is no accident that the determinate situation categories were operationalized as the legal rules for ultra-hazardous activities and no duty to rescue cases. Both are questions of law. And the indeterminate legal category, negligence, represents a prototypical example of a question of fact for a jury. Might this procedural distinction hold some insights for what types of decisions judges are capable of deciding without bias? The results of the three studies reported here suggest perhaps so. Does that extend to all training in determinate situation categories, however complex the judgment task? Further research in those domains will be necessary to know for sure.

That is not to say that a social-cognitive psychologist who was not exposed to classical political theory or legal practice could not have developed CCAM. To the contrary, the literature review suggests that there are studies to support the elements of the model scattered across various research areas. But familiarity with classical political theory and intimate knowledge of another professional domain are what prompted a search for psychological research that might support or undermine these non-

psychological ideas and institutions in the first place. Lacking first-hand knowledge, Darley and Latané (1968) were inspired by an erroneous (Manning, Levine & Collins, 2007) news story to conduct one of the classic studies in social psychology. CCAM was inspired by first-hand experience with a very real feature of our legal system. The success of research on the bystander effect notwithstanding, seeking to understand the social-psychological space associated with particular structural features of other disciplines and domains by building from a grounding in those domains into psychology may be a more direct and reliable approach for constructing models that translate effectively between the laboratory and particular arenas of interest.

Implications and future directions. CCAM holds that learned situation categories can attenuate bias in non-trivial judgments by satisfying the needs for cognitive economy and meaning, thus superseding default processes of social categorization in perception, judgment, and decision making. At a basic level, the results reported here provide strong evidence for the importance of the factors identified by CCAM in understanding social biases in contexts where individuals have training or expertise. In doing so, the results of the studies have implications at three levels.

First is the basic operation of default social categories. Social-cognitive research on the activation and application of social categories and associated attitudes and stereotypes generally assumes that social categorization is an automatic and robust default process designed to meet the needs for cognitive economy and meaning. Most of the basic science research on the topic, however, does not deal with domains in which there are, or could be, alternative categories that satisfy these requirements. Coupled

with the results of prior studies in several domains, the pattern of liability decisions that participants rendered here and shape of the IRT test information functions derived from them, suggests that although social categorization may be automatic, widespread, and influential, it is not especially robust in the presence of alternative categories that can be used effectively to understand and respond to a situation. This is only a first step. Further studies are needed to determine the limits of, and social-cognitive processes associated with, the observed effect. This includes tests of the effects of indirect situated moderators on the parameters of the model, particularly those such as cognitive load that may change the strength of situation and social categories. In addition, the base-line findings regarding the CCAM should be tested in other types of judgments using other category systems that interact with existing research on expert judgment (e.g., word problems) and social biases (e.g., resumes and hiring), as well as application to other real-world decisions.

Second, sociologists and social psychologists have documented the decline of overt prejudice but the persistence of social inequity (Fazio, Jackson, Dunton & Williams, 1995). During the same period, social-cognitive research has documented the existence and persistence of automatic social categorization processes that can subtly bias perception, judgment, and decision-making. Debates over the extent to which the processes account for inequity – and the corresponding suggestions for how to address it – typically adopt the social-cognitive frame, focusing on socio-structural factors (e.g., accountability) thought to decrease the use of general categories in decision-making. CCAM presents an alternative frame for understanding when we should most expect bias

to impact judgments in the legal system, employment settings, and other professional domains. In addition, CCAM points to a method for reducing bias where it is found which is amenable to practical application and realistic about its likely limitations.

Finally, as noted above, CCAM was inspired in part by the classic hypothesis that the professional deformation associated with legal education has the potential to reduce systematic social bias. As such, the use of specific legal rules to test its elements provides a foundation of empirical evidence to inform other broader issues of jurisprudence, legal pedagogy, and legal professionalism. These include (a) informing the debate over the relative benefits of formally realizable legal rules versus more ambiguous legal standards, with an advantage of the former being a reduction of social bias; (b) suggesting how the standard case method can be updated to reflect advances in learning theory (e.g., designing casebooks and law school classes to more overtly utilize guided analogical encoding); and (c) serving as a model for when and how content-specific continuing legal education programs and jury instructions could effectively serve the function of reducing bias.

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Appendix A – Case Summaries

Case Number: F54

Vladislav Kevorkov is the manager of a large farm owned by Takamatsu TechGrow, LLC. In early spring, he decides that he would like to increase the amount of crops planted this year. To do so, he needs to quickly acquire and clear boulders and large tree stumps from 40 acres of land that previously served as a wooded corridor between the fields he manages and the adjoining property, a family farm owned and operated by Henry and Margaret Anderson. Because of the short time available for the work after the purchase, Mr. Kevorkov takes the unusual step of purchasing explosives for use in clearing the land. During the planned blasting operations, Mr. Kevorkov ensures that the workers take all necessary precautions, including those designed to keep the explosives from injuring people and to keep the resulting debris off of his neighbor's land. The blasting nevertheless damages some of the trees on the Anderson's property and the pump in their well.

The Andersons (The Plaintiffs) sue Takamatsu TechGrow (The Defendant) for the $50,000 in damages to their property from the blasting.

Case Number: T18

Linda Wilson was recently widowed. In order to earn money to supplement her social security income and the remainder of her late husband's pension, she started renting the apartment above the garage of her small home in New Jersey. Her first tenants are two 19-year-old men, Donnel White and Tyrone Johnson. Shortly after moving in, the tenants decide to change the bulbs in one of the bedrooms to black lights. At their request, Mrs. Wilson lends them a ladder which hangs on the side of the garage. Unbeknownst to Mrs. Wilson, the ladder is defective and very prone to collapse. While they are changing the lights, the ladder closes suddenly; Tyrone breaks his wrist badly in the fall, requiring surgery.

Uninsured, Tyrone (The Plaintiff) sues Mrs. Wilson (The Defendant) for the $29,000 hospital bill.

Case Number: C94

Dale Johnson, a small family farmer, needs to quickly control an infestation of weeds on a 100-acre section of his property in order to stay in business. To do so, he hires an experienced crop duster to spray an unusually effective defoliant on his field using a small airplane. The crop duster does an excellent job, including taking all the usual precautions to ensure that the chemical spray falls on only the Johnson's property. Even so, during the operation, a gust of wind blew some of defoliant onto the adjoining property. That land, owned by International MaizeSoyEx, Ltd., is used as a test site for genetically modified corn. Within one week, $250,000 worth of MaizeSoyEx's crops on the adjoining the land have wilted and died.

MaizeSoyEx (The Plaintiff) sues Mr. Johnson (The Defendant) for the damages.

Case Number: Y23

MetroProperties, Inc. owns and manages several suburban rental properties. Bill Hopkins, a recent university graduate with a degree in civil engineering, rents a ground floor apartment in one of the properties. Wanting to create a raised platform for his grill to protect the small porch, Mr. Hopkins borrows a gas power saw from the maintenance crew that services his building. Unfortunately, the set screws (i.e., the screws that are intended to keep the blade in alignment) were poorly designed and become loose when the saw is on. Having never checked the set screws, the crew is unaware of this problem. As a result of the defect, while Mr. Hopkins is using the saw, the blade comes loose causing the saw to jump into his leg injuring it severely.

Mr. Hopkins (The Plaintiff) sues MetroProperties (The Defendant) for the $20,000 cost of the treatment of his injuries.

Case Number: H37

Gordon Norman owns a small business reclaiming waste oil from service stations and selling it to oil refineries for reprocessing. To transport the oil, he maintains a small fleet of tanker trucks, which he has modified to look and operate alike. Mr. Norman hires independent truck drivers to locate and purchase the waste oil, load it into the tanker trucks, and bring it back to his yard where he buys it from them at a premium. Looking to expand his fleet, Mr. Norman acquired an older used oil tanker that required cleaning, repair, and heavy modifications. Mr. Norton recruited Abdul Ahmed, one of his new drivers, to drop the oil tanker at a station to be steam cleaned. The next day, Mr. Norton and Mr. Ahmed went to the station. Seeing that that outside of the tanker had been cleaned, Mr. Norton prepared his equipment to start the preliminary modifications of the truck, including welding an area on the rear of the tanker. Unfortunately, the interior of the tanker had not been cleaned. When Mr. Norton started welding, the tanker exploded, killing him instantly and injuring Mr. Ahmed.

Mr. Ahmed (The Plaintiff) sues Mr. Norton's estate (The Defendant) for his injuries.

Case Number: P72

Jonathan Elder is co-owner of BestPriceBoats, Ltd., an expanding retailer of small and mid-sized recreational water craft. As part of his business, Mr. Elder transports the water craft he sells from his lot to various lakes in their sales region. However, he contracts out the job of unloading the craft from the transport truck to the harbor. Following a sale of two larger boats to families in a new area, he hired Mario Bañuelos, an independent crane, loader, and tow-truck operator located near the delivery area, to unload the boats. Uniquely, for heavy lifting jobs, Mr. Bañuelos uses a sugar cane derrick that he modified himself for that purpose. Prior to moving the 4-ton boats from the truck, over the docks, and into the harbor, Mr. Bañuelos took his standard precautions, including securing the derrick-loader to concrete fittings with steel cables. Shortly after lifting the first boat off the transport, the loader collapsed. The fall caused thousands of dollars of damage to the boats and transport truck.

Mr. Elder (The Plaintiff) sues Mr. Bañuelos (The Defendant) for the damages.

Case Number: X40

Following a spring-break party, two friends, Sean MacDunn and Austin MacLeod decide to explore a nearby lake. To do so, they rent a canoe from Janet Holbrooke, a single mother who owns and operates a business renting boats and bicycles to tourists. Not long after setting out, having had too much to drink, the friends accidentally capsize their canoe. Ms. Holbrooke hears their cries for help, but does nothing. Mr. MacLeod is rescued some time later by another tourist, but by that time Mr. MacDunn had drowned.

Mr. MacDunn's estate (The Plaintiff) sues Ms. Holbrooke (The Defendant) for damages.

Case Number: I84

High-school friends Robert Wilson and Jamal Washington like to make pipe bombs from firecrackers. In order to obtain gunpowder to do so, they purchase 60 cherry bombs, which they take to Jamal's house. Once there, they cut the fireworks open, yielding a total of half-a-cup of gunpowder. While doing so, Jamal's mother, Monika Washington, tells them to stop making a mess in the kitchen. Once the boys have finished, they take the gunpowder to the garage and pour it into a pipe, one end of which is closed off with a screw-on cap. Unable to find anything else to close the other end of the pipe with, Robert moves to the driveway where he attempts to use a hammer to pound the open end of the pipe closed. Robert pounds on the pipe several times, during which Jamal's father, Alfonzo Washington, looks out to see what the noise is and tells the boys not to burn down the garage. Several strikes with the hammer later, the pipe explodes, blowing off Robert's hand.

Robert and his parents (The Plaintiffs) sue Mr. and Mrs. Washington (The Defendants) for the injury.

Case Number: N05

Robert Nelson, 46 years old and a recreational pilot, planned to fly a small rented airplane round trip from Chicago, Illinois to Telmark Field, a public airstrip located on a man-made peninsula in Lake Michigan. In preparation for the trip, he contacted Excellent Aviation, Inc. the company that leases and operates Telmark Field, registered his flight plan and paid his landing fees. Mr. Nelson's trip to Telmark Field was without incident. On the return flight, shortly after takeoff, the plane Mr. Nelson was flying developed mechanical problems. Under radio guidance from Maria Vasquez, the employee of Excellent Aviation who was working in the control tower, he attempted to return to Telmark Field to land but was unable to do so. His plane crashed into Lake Michigan near the landing strip. Excellent Aviation did not maintain equipment for a water rescue nor did its employees attempt to rescue Mr. Nelson. Mr. Nelson drowned before municipal rescue vehicles could reach the plane.

Mr. Nelson's estate (The Plaintiff) sues Excellent Aviation (The Defendant) for his death.

Case Number: W59

Jason McKay, Ben Moen, Anthony Sanders, and Molly Cardozo, all high-school friends, were at Molly's house celebrating Jason's 17th birthday. During the party, the group went upstairs to Molly's room, leaving her parents, who were watching TV, downstairs. Sometime later, Molly got out an unloaded revolver and the friends started talking about a friend who had died playing Russian Roulette. Molly said that she wanted to try the game. While the others watched. She put a bullet in the gun, spun the cylinder, pointed the barrel to her head, and pulled the trigger several times. She then checked the gun, spun the cylinder again, and fired 3 or 4 more times. The last time, the gun fired, killing her instantly.

Molly's parents (The Plaintiffs) sue Jason, Ben, and Anthony (The Defendants) for Molly's death.

Case Number: S77

James Haverford is an accountant for Salvatore Collateral Properties, LLC, a family owned business. As part of his employment, Mr. Haverford delivered the accounting books to his supervisor, Vincent Salvatore. Mr. Salvatore placed the books in a locked safe. In an unrelated lawsuit, Salvatore Collateral Properties was found to owe another company money. To aid in the collection of the judgment in that lawsuit, the judge ordered Mr. Haverford, as the accountant of Salvatore Collateral Properties, to deliver the accounting books to the court. Mr. Haverford did not do so and was found in contempt of court. At the contempt hearing, Mr. Haverford stated that he could not produce the accounting books. In addition, in an effort to contest the contempt ruling and avoid jail, Mr. Haverford asked Mr. Salvatore to deliver the books to him. Knowing the situation, Mr. Salvatore nevertheless failed to deliver the books for two weeks, during which time Mr. Haverford was arrested and put in jail.

Mr. Haverford (The Plaintiff) sues Mr. Salvatore (The Defendant) for damages related to the imprisonment.

Case Number: L13

Jade Green lives in Newark, New Jersey. Her house has a burglar alarm system manufactured by Knight Systems, Inc. As an added feature, the burglar alarm system is equipped with "police," and "fire" buttons. If one of the buttons is pressed, the alarm notifies an operator at Security Systems, who then calls the police or fire department listed in their records. Customers provide Knight Systems the contact information for police and fire departments when they sign up for a service plan. Knight Systems does not check to see if the information provided is accurate. One evening, Ms. Green saw smoke and fire coming out of her basement furnace room door. She tried to call 911, but misdialed, then hit the "fire" button on the alarm and ran to several neighbors' houses until she found one who was home, where she eventually successfully called 911. In the meantime, immediately after the fire button was pressed, Samuel Baker, the operator at Knight Systems, tried to contact the fire department; however, because the information on file was incorrect, it took him 3 tries to find the correct number. As a result of the delay, the fire trucks responded 4 minutes later than they would have normally. Thinking that the call was placed immediately after the fire started, they approached the fire as if it had only been burning a short time. As the first firefighter, Darry Lewis, entered the house, the floor, weakened by the blaze, gave way and he fell into the basement where he died.

Mr. Lewis' wife and estate (The Plaintiffs) sue Knight Systems (The Defendant) for his death.

Case Number: E80

Andy Miller, 7 years old, lives with his grandparents in a small town in Eastern Oregon. One summer afternoon, Andy walked to a local story to purchase patches for his bike tire. As Andy started home, Cody Clark, a 22-year old resident of the town who was driving in his pickup truck with two friends, stopped and offered Andy a ride. As the cab of the truck was full, Andy climbed in the truck bed. When the truck passed Andy's house, he jumped from the truck and was injured.

Andy's grandparents (The Plaintiffs), who are his legal guardians, sue Mr. Clark (The Defendant) for Andy's injuries and medical expenses.

Case Number: A61

Rose Simmons, a 62 year-old high-school teacher, regularly walks her dog in Dallas, Texas. On one such trip, while walking down a familiar side street near the railroad yard, Ms. Simmons trips and falls over an elevated portion of a cracked sidewalk. In the fall she incurs significant injuries, requiring medical treatments costing over $35,000. The City of Dallas had not inspected the sidewalk and was unaware of the crack.

Ms. Simmons (The Plaintiff) sues the City of Dallas, Texas (The Defendant) for her injuries.

Case Number: U29

KHJ is a rock station owned by Omni Communications, Corp. It broadcasts in Los Angeles and the surrounding area. Its primary listening audience is teenagers, of which audience it has approximately 50% of the market share. To increase the share of listeners during the summer, it ran an ongoing contest in which the stations' star DJ, "The Real Don Steele," would drive to various locations during the day and give money to the first listener to find him and correctly answer a question. To generate excitement and aid the search, the station would periodically broadcast hints as to when the DJ was driving and as to his location: "The Real Don Steele is moving into Canoga Park-so be on the lookout for him. I'll tell you what will happen if you get to The Real Don Steele. He's got cash to give away if you can get it..." During the contest, the DJ often saw teens in cars following him or racing from location to location in order to be the first to win the prize. On one afternoon, after failing to get to the DJ first, two groups of teens followed a hint and raced to the new location. In the process, the teens forced another car off the road, severely injuring its driver, DeShawn Jones.

Mr. Jones (The Plaintiff) sues Omni Communications, Corp. (The Defendant) for his injuries.

Case Number: 089

Shaniqua Jackson is a 39-year old resident of Detroit, Michigan. One winter afternoon, while entering Anderson's Supervalu, a local grocery store, Ms. Jackson fell after tripping over the raised edge of a frozen floor mat. A few other customers have tripped over the mat before and the store manager was aware that raised edges on the mat can pose a problem. The store employees that attended to Ms. Jackson after the fall reported that her injuries appeared to be minor. Complaining of back pain, Ms. Jackson went to see a doctor. Ultimately, Ms. Jackson has an operation on her neck and back. Even after the operation, Ms. Jackson indicates that she has chronic pain that prevents her from working.

Ms. Jackson (The Plaintiff) sues Anderson's Supervalu (The Defendant) for $275,000.

Case Number: G30

Daphne Ann Williams, is a new wrangler and hand on a large farm owned by Deutche-Stein Markgarten, Ltd. and managed by Otto Klein. Mr. Klein requested that Ms. Williams move several horses from one pasture to another. Some time before, Mr. Klein had modified the hinges on the gate between the pastures so that it swung shut automatically a short time after being opened. He did not tell Ms. Williams about the gate when requesting that the horse be moved. Ms. Williams placed halters on several of the horses and led them to the gate. As she was leading the second horse through the gate, it swung shut, hitting the horse and causing it to rear up. In the process, Ms. Williams was lifted off of the ground, knocked over, and kicked in the face by one of the horses. As a result, she has had several surgeries and is partially paralyzed.

Ms. Williams (The Plaintiff) sues Mr. Klein and Deutche-Stein Markgarten, Ltd (The Defendants) for her injuries and medical expenses.

Case Number: D45

Wei Wong, a longshoreman, works for Dayton-Swenson Stevedore Company loading and unloading cargo from ships docked in the Port of Seattle, Washington. On one job, he and his coworkers loaded 1800-pound industrial rolls of paper, which are moved using 3-wheeled hand carts, on top of a layer of bags of flour. To reach the area where the flour was stowed, they laid plywood sheets as temporary flooring, over which they rolled the hand cart. While Mr. Wong and 3 of his coworkers were moving a roll over the flooring, one of the wheels of the hand cart broke through. When they tried to lift it out, Mr. Wong strained the muscles in his rib cage.

Mr. Wong (The Plaintiff) sues the Dayton-Marten Stevedore Company (The Defendant) for his injuries.

Case Number: H25

Darnell Washington was driving his Cadillac Escalade South on Interstate Highway 220 in Mississippi with his friend Lionel Davis. While passing an on-ramp, Mr. Washington's Escalade broke down. He did not steer the car off the road, and it ultimately came to a stop in the left lane of the Interstate Highway near the yellow line. Shortly thereafter, Jacob Moore, a long-haul truck driver operating a semi-truck and trailer, came upon Mr. Washington's car. Mr. Moore, also driving in the left lane to avoid the heavy traffic entering on the ramp, attempted to break and steer into the median around Mr. Washington's car. Nevertheless, the semi-truck sideswiped the car before tipping over on its side and sliding down the highway. Mr. Washington was severely injured in the accident and later died in the hospital.

Mr. Washington's estate (The Plaintiff) sues Mr. Moore (The Defendant) for his injuries and death.

Case Number: K93

Wyatt Harris is a logger in Southern Georgia. While driving a skidder down a logging trail to his work site, Mr. Harris came upon a downed tree blocking the path. After trying to move the tree unsuccessfully with the skidder, Mr. Harris got out and proceeded to cut the tree with his chainsaw, which was manufactured by Husqvarna Corporation. The model of saw Mr. Harris owned was made without a chain break, a safety mechanism that can stop the saw if the user loses control of it, but one that can also interfere with the regular operation of the saw. When Mr. Harris had almost completed the cut, the chainsaw kicked back, hitting him in the chest and lacerating his heart. He died within approximately ten minutes from the injuries.

Mrs. Chastity Beth Harris, Mr. Harris's wife, and his estate (The Plaintiffs) sue Husqvarna Corp. (The Defendant) for damages related to his death.

Case Number: F23

Dr. Janet Hendricks is a 48-year old physician and mother of 2. She was driving East late one night on an unlighted rural section of Country Road 26, a 2-lane highway outside of Baltimore, Maryland. Her children, who are 13 and 11 years old, were also in the car with her. Approximately half a mile from the intersection of Country Road 26 and another county road, the car ran out of gas. Dr. Hendricks steered the car off the road onto the right gravel shoulder so that only the left tires were on the pavement. Seeing a gas station ahead at the intersection, she walked there, purchased a gas can and 2 gallons of gas, returned to the car and began to pour the fuel into the gas tank, which was located on the driver's side of the car. At that time, Aikai Sutori, aged 21, and his brother Sendai, aged 17, were traveling East on Country Road 26 in a Honda Civic. As they approached, seeing that there was a disabled vehicle on the side of the road, Aikai slowed to approximately 35 mph and steered the car toward the center line. As the Civic approached and passed, Dr. Hendricks finished refueling, pulled the gas can out of the fuel tank, and turned to step toward the trunk of the car. At that time, she was hit by the Civic and seriously injured, later dying at the hospital.

Dr. Hendricks' estate (The Plaintiff) sues Mr. Sutori (The Defendant) for her injuries and death.

Case Number: R68

Matthew Collins is a senior at Roosevelt High School enrolled in an Industrial Technology class. One of the carpentry projects in the class involved construction of finished moldings from general stock lumber. The first step in the process was to cut the stock lumber into strips using an industrial table saw, which was manufactured by AAA Acme Tool Group, Inc. The saw had a blade guard; however, AAA Acme Tool Group designed the blade guard on the saw to be detachable. In preparation for making the cuts, Matthew had to remove the guard from the saw to accommodate the size of the stock lumber. While cutting the first piece, the blade hit a knot, knocking the board up. As it came down, Matthew's left hand, which he had been using to guide the board, fell into the saw cutting it severely.

Matthew Collins (The Plaintiff) sues AAA Acme Tool Group (The Defendant) for his injuries.

Case Number: P23

John Kim, 37-years old, lives in Seattle, Washington. Eight years ago, Mr. Kim won a Hamilton Beach toaster oven at a holiday party held by the owners of the large software company where he works. Since that time, he used the toaster oven almost every morning to cook toast and had never had a problem with it. One morning, Mr. Kim was late for a doctor's appointment. As he hurried out the door, he grabbed his toast from the toaster oven and left the house. Later, during his appointment, a staff member at the clinic informed him that his apartment was on fire. Mr. Kim does not remember whether he turned off the toaster oven. The investigations of the fire marshal and an insurance adjuster both suggest that the fire started near the toaster oven. Further, an electrical engineer who used to work for Hamilton Beach testified that, if the oven was left on, it was likely that the toaster's automatic shutoff mechanism, which is designed to shut the toaster off after 3 to 4 minutes, had failed.

Mr. Kim (The Plaintiff) sues Hamilton Beach (The Defendant) for the damages that resulted from the fire.

Case Number: V08

Susan Thompson, a 41-year old mother of two, is a nurse at a local hospital. After developing pain and weakness in her left shoulder and hand, Mrs. Thompson consulted with Dr. Jose Rodriguez, a staff neurosurgeon at Santa Maria Medical Centers, LLC. Dr. Rodriguez diagnosed Mrs. Thomson with a herniated disk and recommended a cervical laminectomy, a surgery in which some of the bone is shaved off the neck to relieve pressure on the spinal column. Mrs. Thompson agreed and Dr. Rodriguez performed the surgery. It appeared successful; however, less than a year later the symptoms returned. Dr. Rodriguez attributed this to possible regeneration of bone material and recommended that the surgery be repeated. After consulting with another neurosurgeon, Mrs. Thompson agreed to a second surgery. As with most hospitals, Santa Maria Medical Centers' policies place the responsibility for decisions such as the selection of equipment and positioning of the patient on the surgeon. Although the surgery is generally performed with patients lying down and their heads secured with pins or clamps to prevent movement, Dr. Rodriguez decided to perform the surgery with Mrs. Thompson in a sitting position and her head secured to a horse-shoe headrest with adhesive tape. When the surgery was finished, Mrs. Thompson could not move her arms or legs. Dr. Rodriguez performed a third surgery to determine the cause, but found nothing.

Mrs. Thompson (The Plaintiff), now a quadriplegic, sues Santa Maria Medical Centers, LLC (The Defendant) for the consequences of her surgery.

Appendix B – Selected Instructions and Measures

CONSENT FORM

IRB # 1104P98080
Version Date: April 15, 2011

Thank you for your interest in the Legal Education Study. This form contains background information about the study, instructions for completing the study, and contact information for any questions you might have. We ask that you read this form in its entirety and encourage you to ask the researcher any questions you may have before indicating that you consent, below. By signing the Consent Form, you will be consenting to participate in the study.

I. Background Information.

Purpose.

The purpose of this study is to determine the extent to which training people to use legal rules affects how they understand, and make decisions about, situations involving disputes. The results of this study may help us to improve certain types of professional training programs. Please take the study seriously and do your best.

Procedures.

This study has several conditions, some of which involve training to use legal rules and some that do not. Participants are randomly assigned to these conditions. If you consent to participate in this study, you may be shown a set of materials that teach you about one or more legal rules and take a short test to make sure that you learned the rule(s). If you are assigned to the control condition, you will not receive the training. All participants will be asked to do the following things: Complete some survey items regarding your general outlook on life and society, read 24 short summary paragraphs describing the facts of legal cases, answer questions about what you think about the people described in the summaries and the case itself, provide some basic demographic information, and provide some feedback on the study. Depending upon the condition, completing the study can take approximately 1 to 2 hours.

Risks and Benefits of being in the Study.

There are minimal foreseeable risks to participating in this study. The most sensitive thing you will be asked to do is provide your opinions on several social issues. You may also experience some emotions while reading the short summary paragraphs describing the facts of a legal case. You may refuse to answer any question you feel uncomfortable with, and elect to discontinue participation at any time without any penalty. There are no benefits to participation.

Compensation.

For your participation in the study you will be compensated with four (4) REP points. REP points may be applied toward extra credit in a psychology course. Please talk to your instructor about the particular policy for your course.

Confidentiality.

The records of this study will be kept private. In any report we might publish about this study, we will not include any information that will make it possible to identify you. Research records will be stored securely and only researchers will have access to the records.

Voluntary Nature of the Study.

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota. If you decide to participate, you are free to not answer any question or to withdraw at any time without affecting those relationships.

Contacts and Questions.

The researchers conducting this study are: Prof. Eugene Borgida and Erik Girvan. You may ask any questions you have now via email; borgi001@umn.edu and girva004@umn.edu. If you have questions later, **YOU ARE ENCOURAGED** to contact them at 612-625-3381 In the event that you experience a stressful or strong emotional response to the materials used in this study, you are encouraged to contact the Boynton Mental Health clinic, (612) 624-1444, or University Counseling and Consulting Services, (612) 624-3323.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **YOU ARE ENCOURAGED** to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

II. Instructions for the Study.

Once you have signed the Consent Form giving your consent, you will be able to proceed with the study. You will be given further directions on how to complete the study at that time.

III. Statement of Consent.

I have read the above information. I have asked any questions I had and received answers to my satisfaction. By signing on the following line, I consent to participate in the study.

Signature: _____ Date: _____

STUDY OVERVIEW

Thank you for agreeing to participate in the study. It has several parts, which proceed as follows:

- Answer survey questions about yourself.
- View a brief set of materials on PowerPoint;
- Read 24 short summaries of legal cases, answer questions about the individuals involved, and decide the outcome of the cases;
- Respond to survey questions about your views on society; and
- Answer some basic demographics questions.

Each part will have additional instructions. Completing the study will take between 1 and 2 hours. If you need a short break, please let the experimenter know.

If you have not done so already, please turn off your cell phone.

You may turn to the next page of the packet when you are ready to begin.

PART 2: LAW SCHOOL POWERPOINT PRESENTATION

Shortly, you will be asked to read several short summaries of the facts of actual legal cases, answer questions about the individuals involved, and then decide the cases. Part 2 of the study is a PowerPoint presentation that will help get you ready for this task.

Now, please raise your hand to let an experimenter know that you have finished with Part 1. He or she will help you get started on Part 2. When you are instructed to do so in the PowerPoint presentation, you may turn the page over and proceed with Part 3. Until then, **please leave your packet on this page**.

PowerPoint Presentation Version: _____

PART 3: LEGAL DECISIONS

In the next portion of the study, you will read short summaries of the facts of 24 actual legal cases. After each summary, you will note the case number on the top of your survey sheet, answer a set of questions about the individuals involved, decide the case, indicate your confidence in the decision, and provide a very short statement of the main reason for your decision.

Let the experimenter know when you are ready to continue. He or she will access the PowerPoint file with case summaries. Then you may proceed to the next page of the packet and advance the PowerPoint to the next slide. Please remember to note the appropriate case number on the top of each page of your survey sheet.

Case Order: _____

CASE #:_____

Using the scale provided, indicate whether each of the following characteristics accurately describes the ***plaintiff*** in this case:

	Definitely Does Not Describe the Plaintiff								***Definitely Describes the Plaintiff***
trustworthy	1	2	3	4	5	6	7	8	9
tolerant	1	2	3	4	5	6	7	8	9
friendly	1	2	3	4	5	6	7	8	9
sincere	1	2	3	4	5	6	7	8	9
	Definitely Does Not Describe the Plaintiff								***Definitely Describes the Plaintiff***
capable	1	2	3	4	5	6	7	8	9
skillful	1	2	3	4	5	6	7	8	9
intelligent	1	2	3	4	5	6	7	8	9
confident	1	2	3	4	5	6	7	8	9

Now indicate whether each of the following characteristics accurately describes the ***defendant*** in this case:

	Definitely Does Not Describe the Defendant								***Definitely Describes the Defendant***
trustworthy	1	2	3	4	5	6	7	8	9
tolerant	1	2	3	4	5	6	7	8	9
friendly	1	2	3	4	5	6	7	8	9
sincere	1	2	3	4	5	6	7	8	9
	Definitely Does Not Describe the Defendant								***Definitely Describes the Defendant***
capable	1	2	3	4	5	6	7	8	9
skillful	1	2	3	4	5	6	7	8	9
intelligent	1	2	3	4	5	6	7	8	9
confident	1	2	3	4	5	6	7	8	9

Next, indicate your decision as to whether the defendant should be liable to the plaintiff in this case:

Definitely Not Liable			***Perhaps Not Liable***	***Perhaps Liable***			***Definitely Liable***
1	2	3	4	5	6	7	8

How confident are you that your liability decision is legally correct?

Not at all Confident		***Somewhat Confident***		***Reasonably Confident***		***Absolutely Confident***
1	2	3	4	5	6	7

Finally, in one sentence or less, please provide the main reason for your decision in this case.

PART 4: SURVEY AND DEMOGRAPHICS QUESTIONS

In the last portion of the study you will answer a set of questions about your views on society and social issues. In addition, there will be some questions about you, including some basic demographic questions.

Before proceeding, in the space provided, please answer the following question: What do you think our hypothesis is in this study? Be as specific as possible.

Thank you. When you are ready to continue, please turn to the next page of the packet.

<table>
<tr><td colspan="2">Please answer the following questions about yourself. Remember, all of your responses will be kept confidential.</td></tr>
<tr><td>What is your age? _____ Years</td><td>What is your gender?
O Male O Female</td></tr>
<tr><td rowspan="2">Please indicate your race/ethnicity
O White/Caucasian
O Latino/Hispanic
O Black/African American
O Native American
O Asian/Asian American
O Other _____</td><td>Are you a native English speaker?
O Yes O No</td></tr>
<tr><td>How many semesters of university education have you COMPLETED (include both undergraduate and graduate school)?
_____ Semesters</td></tr>
<tr><td>As best you can recall, what was your overall GPA in HIGH SCHOOL (e.g., 3.1)?

GPA: _____</td><td>What was to highest possible GPA at your HIGH SCHOOL (e.g., 4.0)?

Total Possible GPA: _____</td></tr>
<tr><td>As best you can recall, what is your overall GPA in COLLEGE (e.g., 3.1)?

GPA: _____</td><td>What is the highest possible GPA at your College or University (e.g., 4.0)?

Total Possible GPA: _____</td></tr>
<tr><td colspan="2">As best you can recall, what was your score on the ACT or SAT (please respond to both if applicable)?</td></tr>
<tr><td>ACT (scores range from 11 to 36)

Score _____</td><td>SAT (scores range from 510 to 1600)

Score _____</td></tr>
</table>

Debriefing

The ways in which biases related to social categories like race and gender can affect judgments is well established (Fiske & Taylor, 2008). This research focuses on the role that learning decision frameworks, such as legal rules, might have in reducing the effects such social biases on decision making in professional contexts like legal decision making.

The summary paragraphs that you read are based upon the facts of real legal cases. However, we altered the descriptions of the parties described in the cases so that they represented members of social groups that people typically view as more or less sympathetic. Prior research suggests that the social groups will affect how people perceive the parties and cause them to decide cases for the party that is from the more sympathetic social group. Our general hypothesis is that this will only be true for people who have not learned a legal rule that they can use to decide the case. If correct, this research may help us to understand how training programs can better be designed to decrease the effects of stereotypes and other social biases on decision making in professional contexts.

Thank you for your help. As a final note, please do not discuss any details of this study with other students in Psychology courses at the University of Minnesota, or anyone else who you think might enroll in this study.

If you have any questions about any aspect of the research, feel free to contact the Principal Investigator on this project, Erik Girvan (girva004@umn.edu) or his faculty sponsor Dr. Eugene Borgida (borgi001@umn.edu).

If you would like your data to not be included in our study and instead deleted, please let the experimenter know now. This will not affect your compensation.

Appendix C – Example Training Materials

Legal Decisions Study

Please press the "→" key to continue.

(Version 2.1)

Introduction

- Thank you for participating in the Legal Education Study.
- Throughout the PowerPoint presentation, once you have completed each slide, press the "→" key to continue. You may also use the "←" key to return to a prior slide if necessary.
- To get you in the right mind-set for the remainder of the study, you will now watch a short, funny movie clip about law school.

Law School

(Click on the box below to view the film clip)

Instructions

- Shortly, you will be asked to decide the outcome of 24 actual legal cases.
- To prepare you to make the decisions, you will first learn about two legal rules that judges used to resolve *some* of the cases: The rule for **Ultrahazardous Activity** cases and the rule for **No Duty of Care** cases. You will also learn how to recognize a situation as an example of one of these two types of cases.
- Please pay close attention to the training so that you may apply it to the cases as well as possible. As an incentive to do so, the 10 participants in the study who decide the highest number of cases in the same way as the judges decided them will get $40. (In the event of a tie, recipients of the $40 will be selected at random from those who made equally accurate decisions.)
- When you are ready, please continue with the training.

Ultrahazardous Activity

- One category of court cases are those concerning damages that result from activities that are considered ultrahazardous or abnormally dangerous. You are going to learn how to identify cases that fit into this category and how to decide them. Please pay close attention, you will be asked to identify whether cases fall into this category and, if so, indicate how each should be decided.

How to Identify Ultrahazardous Activity Cases

- A case fits into this category if it involves an abnormally dangerous activity. An activity is abnormally dangerous if:

  (1) The activity creates a foreseeable and highly significant risk of harm even when reasonable care is exercised by all actors; and

  (2) The activity is not commonly done.

How to Correctly Decide an Ultrahazardous Activity Case

- Under the law, if a case involves an abnormally dangerous activity, then the actor who does it is **always liable** for physical harm or property damage resulting from the activity. This is true even if the actor tried to minimize the risk.

An Example of an Ultrahazardous Activity Comes From a Case About the Use of Explosives:

- A farmer wants to quickly remove boulders and stumps from a piece of his property that adjoins his neighbor's land.
- Given the short time frame to do so before he has to plant his crops, he takes the unusual step of using explosives for the job.
- The farmer makes sure to take all of the precautions he can to prevent injuries to people and damage to the neighbor's property.
- Even so, the explosions damage some of the neighbor's trees and the pump to their well.
- Is the farmer liable?

Correct Solution:

- Actor: Farmer.
- Activity: using explosives to clear property next to another person's land.
- Is the activity normal? No. Most people do not use explosives to clear land next to their neighbor's property.
- Does the activity present a significant risk of harm? Yes. Use of explosives always presents a significant risk to near-by people and things.
- Is the risk still significant even after taking steps to reduce it? Yes. Detonating a quantity of explosives large enough to destroy a boulder or large stump will necessarily present a significant risk or damage to a sizable area. The only way to avoid the risk to that area is not to use explosives.
- **Result: the farmer is liable for damages to his neighbor's property**.

Another Example Comes From a Case About Permitting Use of Defective Products:

- An individual owns a ladder that is designed defectively such that it collapses unexpectedly when someone is on it.
- The individual does not know about the defect.
- The individual lends the ladder to someone else for use.
- While the ladder is being used it collapses. The borrower of the ladder is injured.
- Is the owner of the ladder liable?

Correct Solution:

- Actor: Ladder owner.
- Activity: Permitting the use of a defective ladder.
- Is the activity normal? No. Most people do not allow others to use defective ladders.
- Does the activity present a significant risk of harm? Yes. The ladder possesses a defect that can cause serious injury.
- Is the risk still significant even after taking steps to reduce it? Yes. Use of a ladder that collapses unexpectedly while being used is inherently dangerous. The only way to avoid the risk to a user of the ladder is not to allow use of it at all.
- **Result: The owner of the ladder is liable for the injuries sustained by the person who borrowed it**.

- Now, please read the following two case examples. While you are doing so, consider the steps for categorizing each one as an ultrahazardous activity case. Also remember that, if a case falls into the category of cases involving an abnormally hazardous activity, then the defendant is liable even if he or she took steps to try to reduce the risk.

Vladislav Kevorkov is the manager of a large farm owned by Takamatsu TechGrow, LLC. In early spring, he decides that he would like to increase the amount of crops planted this year. To do so, he needs to quickly acquire, and clear boulders and large tree stumps from, 40 acres of land that previously served as a wooded corridor between the fields he manages and the adjoining property, a family farm owned and operated by Henry and Margaret Anderson. Because of the short time available for the work after the purchase, Mr. Kevorkov takes the unusual step of purchasing explosives for use in clearing the land. During the planned blasting operations, Mr. Kevorkov ensures that the workers take all necessary precautions, including those designed to keep the explosives from injuring people and to keep the resulting debris off of his neighbor's land. The blasting nevertheless damages some of the trees on the Anderson's property and the pump in their well.

The Andersons (The Plaintiffs) sue Takamatsu TechGrow (The Defendant) for the $50,000 in damages to their property from the blasting.

Is the Defendant liable? YES

Why? Using explosives near someone's property is inherently dangerous and uncommon, so it is an ultrahazardous activity.

Linda Wilson was recently widowed. In order to earn money to supplement her social security income and the remainder of her late husband's pension, she started renting the apartment above the garage of her small home in New Jersey. Her first tenants are two 19-year-old men, Donnel White and Tyrone Johnson. Shortly after moving in, the tenants decide to change the bulbs in one of the bedrooms to black lights. At their request, Mrs. Wilson lends them a ladder which hangs on the side of the garage. Unbeknownst to Mrs. Wilson, the ladder is defective and very prone to collapse. While they are changing the lights, the ladder closes suddenly; Tyrone breaks his wrist badly in the fall, requiring surgery.

Uninsured, Tyrone (The Plaintiff) sues Mrs. Wilson (The Defendant) for the $29,000 hospital bill.

Is the Defendant liable? YES

Why? Lending a defective ladder is inherently dangerous and uncommon, so it is an ultrahazardous activity.

No Duty to Act With Respect to Risks Not Created By an Actor

- A second category of court cases are those concerning the failure of a person to act who had no duty to do so. You are going to learn how to identify cases that fit into this category and how to decide them. Please pay close attention. During this study you will be asked to identify whether a set of cases falls into this category and, if so, indicate how they should be decided.

How to Identify No-Duty-to-Act Cases

- A case fits into this category if:
  (1) the alleged actor's conduct has not created a risk of physical harm to another; and
  (2) the alleged actor does not have a special relationship with the other, e.g., the actor is not the parent or guardian of the other.

How to Correctly Decide No-Duty-to-Act Cases

- Under the law, if a case involves no affirmative duty to act, then the alleged actor is **never liable** for physical harm or property damage. This is true even if the alleged actor could easily have acted to prevent the harm or damage.

An Example of a Situation in Which There is No Duty to Act Comes From a Case About Preventing a Drowning:

- Two friends who have been drinking rent a canoe in order to explore a lake.
- Not far from the dock, they capsize the canoe.
- Although the owner of the business that rented the canoe to them hears their cries for help, the owner does nothing.
- One of the two drown before they are rescued by another person.
- Is the owner liable?

Correct Solution:

- Actor: Business owner.
- Activity: failing to rescue the capsized boatmen.
- Did the actor create the risk of harm? No. There is no indication that the canoe was defective.
- Does the actor have a special relationship with the boatmen akin to that of a parent or guardian? No. They only engaged in a business transaction.
- **Result: the business owner is not liable for the drowning.**

Another Example Comes From a Case About Preventing a Dangerous Activity:

- Two boys purchase firecrackers in order to obtain gunpowder to make a pipe bomb, which they go to the home of one of the boys to do.
- While removing the gunpowder from the fireworks, the mother of the boy whose home they are in tells them not to make a mess.
- Later, after putting the gunpowder in a pipe with one closed end, the boy who does not live in the home tries to close the other end by hammering it shut. The father of the other boy sees this and tells the boys not to start a fire.
- The hammering causes the pipe to explode, blowing off the hand of the boy who does not live in the home.
- Are the parents of the other boy liable?

Correct Solution:

- Actors: Parents of boy's friend.
- Activity: Failing to stop boy from engaging in a dangerous activity.
- Did the actors create the risk of harm? No. The boys acted on their own.
- Do the actors have a special relationship with the injured boy akin to that of a parent or guardian? No. They are the parents of only the other boy.
- **Result: the parents of the injured boy's friend are not liable for his injuries.**

- Now, please read the following two cases examples. While you are doing so, consider the steps for categorizing each one as a case involving no affirmative duty to act. Also remember that, if a case falls into the category of cases involving no affirmative duty to act, then the defendant is not liable, even if he or she could have taken steps to prevent the harm.

Following a spring-break party, two friends, Sean MacDunn and Austin MacLeod decide to explore a nearby lake. To do so, they rent a canoe from Janet Holbrooke, a single mother who owns and operates a business renting boats and bicycles to tourists. Not long after setting out, having had too much to drink, the friends accidentally capsize their canoe. Ms. Holbrooke hears their cries for help, but does nothing. Mr. MacLeod is rescued some time later by another tourist, but by that time Mr. MacDunn had drowned.

Mr. MacDunn's estate (The Plaintiff) sues Ms. Holbrooke (The Defendant) for damages.

Is the Defendant liable? NO

Why? She did not put the men in danger and had no special relationship with them, so she had no duty to act.

High-school friends Robert Wilson and Jamal Washington like to make pipe bombs from firecrackers. In order to obtain gunpowder to do so, they purchase 60 cherry bombs, which they take to Jamal's house. Once there, they cut the fireworks open, yielding a total of half-a-cup of gunpowder. While doing so, Jamal's mother, Monika Washington, tells them to stop making a mess in the kitchen. Once the boys have finished, they take the gunpowder to the garage and pour it into a pipe, one end of which is closed off with a screw-on cap. Unable to find anything else to close the other end of the pipe with, Robert moves to the driveway where he attempts to use a hammer to pound the open end of the pipe closed. Robert pounds on the pipe several times, during which Jamal's father, Alfonzo Washington, looks out to see what the noise is and tells the boys not to burn down the garage. Several strikes with the hammer later, the pipe explodes, blowing off Robert's hand.

Robert and his parents (The Plaintiffs) sue Mr. and Mrs. Washington (The Defendants) for the injury.

Are the Defendants liable? NO

Why? They did not put the boy in danger and had no special relationship with him, so they had no duty to act.

Test Your Knowledge

- Next you will see the four example cases in random order.
- Your job is to:
  - Accurately classify the cases as either ultrahazardous-activity cases or no-duty-to-act cases and
  - Decide the cases based on that classification.
- Repeat this exercise using the "→" and "←" keys until you can correctly classify and decide the four example cases.

High-school friends Robert Wilson and Jamal Washington like to make pipe bombs from firecrackers. In order to obtain gunpowder to do so, they purchase 60 cherry bombs, which they take to Jamal's house. Once there, they cut the fireworks open, yielding a total of half-a-cup of gunpowder. While doing so, Jamal's mother, Monika Washington, tells them to stop making a mess in the kitchen. Once the boys have finished, they take the gunpowder to the garage and pour it into a pipe, one end of which is closed off with a screw-on cap. Unable to find anything else to close the other end of the pipe with, Robert moves to the driveway where he attempts to use a hammer to pound the open end of the pipe closed. Robert pounds on the pipe several times, during which Jamal's father, Alfonzo Washington, looks out to see what the noise is and tells the boys not to burn down the garage. Several strikes with the hammer later, the pipe explodes, blowing off Robert's hand.

Robert and his parents (The Plaintiffs) sue Mr. and Mrs. Washington (The Defendants) for the injury.

What kind of case is this?

Are the Defendants liable?

Why?

High-school friends Robert Wilson and Jamal Washington like to make pipe bombs from firecrackers. In order to obtain gunpowder to do so, they purchase 60 cherry bombs, which they take to Jamal's house. Once there, they cut the fireworks open, yielding a total of half-a-cup of gunpowder. While doing so, Jamal's mother, Monika Washington, tells them to stop making a mess in the kitchen. Once the boys have finished, they take the gunpowder to the garage and pour it into a pipe, one end of which is closed off with a screw-on cap. Unable to find anything else to close the other end of the pipe with, Robert moves to the driveway where he attempts to use a hammer to pound the open end of the pipe closed. Robert pounds on the pipe several times, during which Jamal's father, Alfonzo Washington, looks out to see what the noise is and tells the boys not to burn down the garage. Several strikes with the hammer later, the pipe explodes, blowing off Robert's hand.

Robert and his parents (The Plaintiffs) sue Mr. and Mrs. Washington (The Defendants) for the injury.

What kind of case is this? No duty to act

Are the Defendants liable? NO

Why? They did not put the boy in danger and had no special relationship with him, so they had no duty to act.

Vladislav Kevorkov is the manager of a large farm owned by Takamatsu TechGrow, LLC. In early spring, he decides that he would like to increase the amount of crops planted this year. To do so, he needs to quickly acquire and clear boulders and large tree stumps from 40 acres of land that previously served as a wooded corridor between the fields he manages and the adjoining property, a family farm owned and operated by Henry and Margaret Anderson. Because of the short time available for the work after the purchase, Mr. Kevorkov takes the unusual step of purchasing explosives for use in clearing the land. During the planned blasting operations, Mr. Kevorkov ensures that the workers take all necessary precautions, including those designed to keep the explosives from injuring people and to keep the resulting debris off of his neighbor's land. The blasting nevertheless damages some of the trees on the Anderson's property and the pump in their well.

The Andersons (The Plaintiffs) sue Takamatsu TechGrow (The Defendant) for the $50,000 in damages to their property from the blasting.

What kind of case is this?

Is the Defendant liable?

Why?

Vladislav Kevorkov is the manager of a large farm owned by Takamatsu TechGrow, LLC. In early spring, he decides that he would like to increase the amount of crops planted this year. To do so, he needs to quickly acquire and clear boulders and large tree stumps from 40 acres of land that previously served as a wooded corridor between the fields he manages and the adjoining property, a family farm owned and operated by Henry and Margaret Anderson. Because of the short time available for the work after the purchase, Mr. Kevorkov takes the unusual step of purchasing explosives for use in clearing the land. During the planned blasting operations, Mr. Kevorkov ensures that the workers take all necessary precautions, including those designed to keep the explosives from injuring people and to keep the resulting debris off of his neighbor's land. The blasting nevertheless damages some of the trees on the Anderson's property and the pump in their well.

The Andersons (The Plaintiffs) sue Takamatsu TechGrow (The Defendant) for the $50,000 in damages to their property from the blasting.

What kind of case is this? Ultrahazardous activity

Is the Defendant liable? YES

Why? Using explosives near someone's property is inherently dangerous and uncommon, so it is an ultrahazardous activity.

Linda Wilson was recently widowed. In order to earn money to supplement her social security income and the remainder of her late husband's pension, she started renting the apartment above the garage of her small home in New Jersey. Her first tenants are two 19-year-old men, Donnel White and Tyrone Johnson. Shortly after moving in, the tenants decide to change the bulbs in one of the bedrooms to black lights. At their request, Mrs. Wilson lends them a ladder which hangs on the side of the garage. Unbeknownst to Mrs. Wilson, the ladder is defective and very prone to collapse. While they are changing the lights, the ladder closes suddenly; Tyrone breaks his wrist badly in the fall, requiring surgery.

Uninsured, Tyrone (The Plaintiff) sues Mrs. Wilson (The Defendant) for the $29,000 hospital bill.

What kind of case is this?

Is the Defendant liable?

Why?

Linda Wilson was recently widowed. In order to earn money to supplement her social security income and the remainder of her late husband's pension, she started renting the apartment above the garage of her small home in New Jersey. Her first tenants are two 19-year-old men, Donnel White and Tyrone Johnson. Shortly after moving in, the tenants decide to change the bulbs in one of the bedrooms to black lights. At their request, Mrs. Wilson lends them a ladder which hangs on the side of the garage. Unbeknownst to Mrs. Wilson, the ladder is defective and very prone to collapse. While they are changing the lights, the ladder closes suddenly; Tyrone breaks his wrist badly in the fall, requiring surgery.

Uninsured, Tyrone (The Plaintiff) sues Mrs. Wilson (The Defendant) for the $29,000 hospital bill.

What kind of case is this? Ultrahazardous activity

Is the Defendant liable? YES

Why? Lending a defective ladder is inherently dangerous and uncommon, so it is an ultrahazardous activity.

Following a spring-break party, two friends, Sean MacDunn and Austin MacLeod decide to explore a nearby lake. To do so, they rent a canoe from Janet Holbrooke, a single mother who owns and operates a business renting boats and bicycles to tourists. Not long after setting out, having had too much to drink, the friends accidentally capsize their canoe. Ms. Holbrooke hears their cries for help, but does nothing. Mr. MacLeod is rescued some time later by another tourist, but by that time Mr. MacDunn had drowned.

Mr. MacDunn's estate (The Plaintiff) sues Ms. Holbrooke (The Defendant) for damages.

What kind of case is this?

Is the Defendant liable?

Why?

Following a spring-break party, two friends, Sean MacDunn and Austin MacLeod decide to explore a nearby lake. To do so, they rent a canoe from Janet Holbrooke, a single mother who owns and operates a business renting boats and bicycles to tourists. Not long after setting out, having had too much to drink, the friends accidentally capsize their canoe. Ms. Holbrooke hears their cries for help, but does nothing. Mr. MacLeod is rescued some time later by another tourist, but by that time Mr. MacDunn had drowned.

Mr. MacDunn's estate (The Plaintiff) sues Ms. Holbrooke (The Defendant) for damages.

What kind of case is this? No duty to act

Is the Defendant liable? NO

Why? She did not put the men in danger and had no special relationship with them, so she had no duty to act.

- You have now completed the training.
- Please let the experimenter know that you are ready to proceed.

Appendix D: Table of Legal Cases

Ultrahazardous Activity
183 Cal.App.3d 413
502 S.2d 1026
605 P.2d 458
362 P.2d 312
408 P.2d 307
629 So.2d 425

No Duty to Act
160 N.E. 301
185 N.E. 676
282 P.2d 756
690 A.2d 1100
240 N.E.2d 188
50 F.3d 484

Negligence (Liability)
379 P.2d 560
476 S.E.2d 368
527 S.E.2d 90
539 P.2d 36
659 N.E.2d 1113
923 S.W.2d 426

Negligence (No Liability)
196 A.2d 451
21 So.3d 552
544 A.2d 1283
576 F.2d 97
968 F.2d 116
995 S.W.2d 262