Individual Differences in Psychological Essentialism: Predictors and Consequences

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Dedication

Dedicated to my grandparents, my parents and my little princess Lya.
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Abstract of Dissertation

Researchers argued that psychological essentialism is a basic cognitive framework that characterizes how people represent the world. By assuming an underlying causal essence that gives rise to category membership, people tend to see categories as naturally formed, homogenous entities. Whereas previous literature largely focused on studying psychological essentialism with natural kinds and social categories, the present research explored how psychological essentialism applies to abstract domains of concepts, such as crimes and mental disorders, with the aims to investigate: 1) how culture and experience predict individual differences in essentialist thinking; and 2) how essentialist thinking predicts consequences in judgments and decision-making. Specifically, Study 1 compared essentialist beliefs about crime concepts in participants with and without criminal justice training, and found that those with criminal justice expertise showed lower level of essentialist thinking. Further, Study 1 showed that essentialist beliefs predicted culpability and sentencing decisions by lay participants, but not experts. Study 2 compared essentialist beliefs about mental and medical disorders in American and Chinese sample, and found that overall, Chinese participants were more likely than American participants to essentialize disorders as coherent categories but less so as natural kinds. Additionally, Study 2 provided initial evidence showing that essentialist beliefs predicted clinical diagnosis and need for treatment judgments in viewing mental disorder cases. Study 3 examined how study abroad experience predicts variances in essentialist thinking about national groups, by comparing American and Chinese undergraduate students studying domestically and internationally. Results showed that study abroad experience predicted essentialist thinking in different directions in the two cultural samples, addressing the importance of investigating the effect of study abroad experience on psychological essentialism across various social and cultural contexts. Together, results from the current research suggested that psychological essentialism is a prevalent cognitive framework that applies to different domains of concepts, and may be shaped by socio-cultural contexts as well as personal experience. Moreover, the current research also highlighted important real life consequences of essentialist thinking.
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General Introduction

As one of the most fundamental cognitive activities, categorization allows us to organize the mental world and to make predictions about novel entities using established category knowledge (Medin & Aguilar, 1999). How are categories formed in the human mind? Do people from different societies share the same cognitive structure of mental representation? Is category structure open to change, and if so, by what types of sources? The current research aims to approach these broad theoretical questions by investigating how culture and personal experience influences categorization, specifically from the perspective of psychological essentialism. In the following, I will briefly review the theoretical background of psychological essentialism as an account for concepts, and discuss the potential influence from culture and personal experience on essentialist thinking. I will then present three studies that I conducted to examine cultural and experiential differences in essentialist thinking about crime concepts (Paper 1), mental disorders (Paper 2) and nationality (Paper 3). Finally, I will discuss the theoretical and practical implications of these studies.

Psychological Essentialism

Traditional accounts of category structure portray concepts as mental representations of sets of features. For example, the ‘prototype’ model suggested that categories are represented by a prototype that consists of a vector of features, together with their weights to category membership (Rosch & Mervis, 1975). The ‘exemplar’ model, on the other hand, suggested that categories were represented by stored exemplars in the mind (Medin & Shaffer, 1978). Both the prototype model and the exemplar model consider categorization as an outcome of similarity-based comparison between individual occurrence and pre-stored sets of category features. In contrast, theory-based accounts of categorization proposed that categories are not only mere computations of feature similarities, but rather, are formed based on people’s intuitive theories about the underlying causal structure connecting those sets of category features. Consistent with this hypothesis, Ahn (1998) had participants rate the causal status of category features on artifacts and natural species, and asked whether an individual occurrence without a given feature could still belong to the category. Results showed that features weighted with higher causal status were also more likely to affect category membership. This finding lent support to the view that causal understanding about the underlying feature relations plays a critical role in categorization decisions.

How do people intuitively represent, then, the underlying causal structure of category features? Researchers have argued that people tend to believe in an underlying “essence” as the root cause of category features, which makes a thing what it is (Medin & Ortony, 1989; Gelman, 2003; Barrett, 2001). From an essentialist view, category membership should be determined by an underlying essence, which, in some cases, refers to specific content such as genetic patterns in DNA, for natural kinds concepts (such
as a rabbit, or a maple tree). However, it is also possible for people to hold essentialist beliefs without knowing what exactly constitutes the underlying essence of a given category. For example, lay people may not have a complete story about what is the essence of leukemia; however, this does not prevent them from believing that leukemia is caused by certain essence and that someone knows about what that essence is. Rather, it suffices to contain mental representations about an essence placeholder that provides a causal linkage between deeper and surface features (Medin & Ortony, 1989). It is in this sense that we distinguish psychological essentialism from classical views that see categories as groupings of finite features that are immediately observable in category members. Following an essentialist account, category features shall be seen as consequences of the category essence, instead of the defining components of the category identity (Barrett, 2001). Psychological essentialism does not replace previous prototype or exemplar theories of categorization. Instead, it goes beyond the feature-level comparisons, and provides an additional account that highlights the causal linkage among category features, which adds on a new layer of understanding about mental representations of categories.

Psychological essentialism makes a number of predictions about category structure and function. Fundamentally, an essentialist account considers categories as having rich inductive potential, that an infinite number of properties could be inferred by simply knowing the category essence (Gelman, 1988; Barrett, 2001). Even when category features are not directly observable at birth, eventually individuals will develop those features over time (Gelman & Wellman, 1991). An essentialist account considers category membership to be fixed and immutable, that changing superficial features would not cause the change of category identity (Rips, 1989; Keil, 1989). An essentialist account also assumes uniformity among members from the same category (Shtulman & Schulz, 2008), which inevitably ignores within group variability. Haslam et al. (2000) proposed a two-dimensional model of essentialism, arguing that categories could be essentialized along two related yet dissociable dimensions: naturalness and cohesiveness. On the one hand, categories may be essentialized in the sense that they are perceived as naturally existing in the world, discovered beyond human intentions. On the other hand, categories may be essentialized in the sense that they are perceived as coherent and meaningful entities. All category members share the same underlying causal essence, which gives rise to the same category features.

If as argued, psychological essentialism serves evolutionarily beneficial functions for humans to construct and make inferences about the environment (Barrett, 2001), a remaining question is does essentialism apply to concepts in different domains? By default, different domains contain qualitatively different concepts that refer to different kinds of entities (Medin et al., 2000). For example, the concept of tiger and the concept of car are likely to emerge in different stages throughout human history, thus may contain fundamentally different levels of evolutionary meanings. Are there certain content domains that are more proper and appealing than others to be candidates of psychological essentialism? There is no
controversy that living kinds such as animals and plants best satisfy the assumptions of psychological essentialism; previous studies have yielded abundant evidence on how children and adults went beyond surface features and relied upon an underlying reality that defines category membership of biological species (e.g., Gelman & Markman, 1987; Gelman & Wellman, 1991; Rips, 1989). In addition to natural kinds, there is also much evidence that people demonstrate essentialist thinking about social categories within the human species, for example, in forming sex/gender, race/ethnicity and religion categories, as if they were natural kinds (e.g., Haslam et al., 2000; Gil-White, 2001; Heyman & Giles, 2006). However, much less attention has been given to studying abstract concepts, such as justice and emotion (Medin et al., 2000). It is possible that people form abstract concepts via metaphors that relate them to concrete representations (Lakoff & Johnson, 1980; Gibbs, 1997). If this is true, depending on the particular kinds of concepts that are borrowed to facilitate such understanding, we might expect to see a reasoning pattern that mirrors an essentialist framework with abstract concepts. Research on emotion concepts, for example, has shed light on this puzzle. Despite the lack of scientific evidence linking emotion concepts to unique and stable underlying physiological networks, lay participants insisted in viewing emotions as discrete, naturally formed categories, with an underlying defining essence (Lindquist et al., 2013). More empirical evidence is needed to further this line of research and to establish more fine-grained understanding about how concepts are essentialized in the abstract domain.

Sources of Psychological Essentialism

Previous evidence suggested that psychological essentialism emerges early in childhood, that preschoolers believed individual animals would exhibit the same traits based on birth, rather than the adoptive environment (Gelman & Wellman, 1991). They expected individuals to speak the same language as their birth parents do, even when they were raised by adoptive parents that speak a different language (Hirschfeld & Gelman, 1997). Besides, children by 4-5 years old sees category membership as immutable, that it is impossible for an individual animal to change from one category to another (Gelman, 2003; Keil, 1989). These findings all speak to how young children view category membership (in most cases, of natural kinds and social categories, rather than nominal or abstract concepts) as heritable and fixed at birth. Even stronger claims have been made regarding the early emergence of psychological essentialism as an innate cognitive structure, not only in human infants, but inheritable from our non-human primate ancestors. Comparative research has found that rhesus monkeys on the island of Cayo Santiago in Puerto Rico showed category-specific expectation based on intrinsic but not surface property of fruits (Phillips et al., 2010). Researchers argued that this intrinsic-based preference in inductive reasoning reflects an essentialist tendency, which emerges early even in the absence of human language.
If, as proposed, psychological essentialism is an innate cognitive framework, then we should expect individuals across all societies to exhibit some patterns of essentialist thinking. However, recognizing the innate, or pervasive nature of psychological essentialism, does not discount the importance of asking how psychological essentialism develops and modifies under the influence of external socio-cultural inputs, which allows us to scrutinize the individual level variances in essentialist thinking. For example, it has been suggested that psychological essentialism could be shaped by linguistic structures of developmental experience, such as the use of nouns (Heyman & Gelman, 1999) and generic statements (Rhodes et al., 2012). Besides, other studies have demonstrated the flexibility of psychological essentialism, by priming essentialist thinking with materials that highlighted genetic differences (Yzerbyt et al., 2001), or perceived conflicts (Xu & Coley, in prep) between social groups. In the following sections, I will discuss how culture and personal experience may shape essentialist thinking.

### Cultural Differences in Essentialist Thinking

One potentially important source of individual differences in essentialist thinking is socio-cultural input. Researchers have argued that categories can be seen as cultural projections of the mind (Lopez et al., 1997). The Integrated Causal Model (Cosmides & Tooby, 1992) proposes that the information-processing mechanism of the human mind is richly sensible to various aspects of the social environment. One way that culture constitutes an important origin of people’s naïve theories is that the structural arrangement of a society may expose individuals to different dynamics of group relations (Haslam, 2017), which may exaggerate or blur perceived group boundaries to different degrees. For example, Pauker and colleagues (2016) have compared 4 to 11-year-old children from Hawaii (with high racial diversity and multiracial proportion compared to the rest of USA) and from Massachusetts (where 80% of the population is white). It was found that racial essentialism increased with age in children from Massachusetts but not Hawaii, suggesting that exposure to a racially diverse society plays a role in forming (or deconstructing) essentialist beliefs about racial categories. Research has also found that children from Israel, where there is much segregation between ethnic groups (Arab vs. Jewish), were more willing to essentialize ethnicity categories than U.S children (Diesendruck et al., 2013). Similarly, children from Northern Ireland, with over three hundred years of religious conflict history, were found to be more likely to rely on religion than gender or pet ownership identities to make social inferences whereas children in the US showed no such differences (Smyth et al., 2017). These findings suggested that dynamics of social groups may shape essentialist thinking, for example by increasing boundary intensification (e.g., via salient social conflict), or blurring category boundaries (e.g., via diversity exposure).

In particular, evidence suggested that cultural salience may shape essentialist thinking on the naturalness dimension, or the extent to which social categories are perceived as “real” more than on the
cohesiveness dimension (Coley et al., under review). Beyond social arrangements, culture may also shape essentialist thinking via common discourse that provides specific causal explanations favoring an essentialist account— for example, naïve beliefs that see category membership as inherent in blood (Gil-White, 2001) or in DNA (Dar-Nimrod & Heine, 2011). Such cultural theories may increase the likelihood of seeing categories as being defined by an underlying biological reality, or in other words, the tendency to essentialize categories as natural kinds. Additionally, the collectivistic values in the traditional East Asian societies that emphasize group uniformity and group harmony might facilitate psychological essentialism, as compared to traditional Western societies where individual uniqueness are much emphasized. Such a group-level focus may increase the essentialist tendency of perceiving categories as homogeneous and uniform entities in East Asian participants. However, little empirical research has directly investigated such possibilities.

**Experiential Inputs on Essentialist Thinking**

Another possible source of individual differences in essentialist thinking is personal experience. In addition to the external inputs that occur at the macro-societal level, another perspective to investigate environmental impacts on psychological essentialism is by asking what kind of experience people go through in their individual life. The current research will focus on how essentialist thinking is predicted by two types of personal experience: formal training (expertise) received in a specific content area, and experience living in multiple cultures.

First, previous literature suggests that experts, who have acquired special skills or knowledge in a given subject (Ericsson, 1999), not only maintain a larger number of patterns of knowledge (Chase & Simon, 1973), but more critically, developed new systems to organize their knowledge (Chi et al., 1982). In line with this view, previous evidence has documented that taxonomists and maintenance workers weighted morphological features of trees differently, whereas landscape workers took a goal-oriented approach in categorizing trees (Medin, Lynch & Coley, 1997). Likewise, compared to novices who sorted marine species based on appearance, commercial fishermen were more likely to categorize, and reason based on ecological factors (Shafto & Coley, 2003). Similar evidence was reported in the comparison between biology professors and novices in card-sorting tasks, such that biology faculty categorized biology concepts based on deeper relations whereas non-biology major students relied on surface features (Smith et al., 2013). Taken together, the above evidence suggests that formal training changes categorization patterns between experts and novices. However, little evidence directly speaks to the degree to which expertise modifies people’s naïve theories about category essence in particular. It is likely that expertise in a given content domain helps people to realize the socially constructed nature of (some) concepts, thus decrease the tendency to view categories as “real”, natural kinds. It is also likely
that a more comprehensive observation of individual instances would help people to notice within-
category variability as well as between-category similarity, thus debunk the essentialist assumption that
uniform category essence gives rise to uniform category features. The current research seeks to collect
empirical evidence to shed light on this hypothesis.

The second type of personal experience that I will discuss is multicultural living experience. Previous studies suggested that attending integrated kindergarten attenuated ethnic essentialism in Israeli children (Deeb et al., 2011), as well as religious essentialism in Northern Irish children (Smyth et al., 2017). Presumably, integrated education contexts provided children with more opportunities to engage in daily interaction with out-group members more than segregated environments, thus expose children to greater within-category variability which decreases essentialist thinking on the relevant social dimension. Compared to the limited intergroup exposure in kindergarten, would the experience of studying abroad demonstrate a bigger impact on reducing essentialist thinking? Pauker and colleagues (2018) have tracked university students coming to study in Hawaii from other states in the USA, and found that exposure to a racially diverse social environment was associated with decreased racial essentialism. This finding provided important evidence suggesting that essentialist thinking about racial categories may be reduced by experience of living across social contexts. However, this research was conducted within the country of USA, and within the population of white students, who come from relatively the same cultural background. Further studies are needed to explore whether the effect of diversity exposure on decreasing essentialist thinking holds up for individuals coming from diverse cultural backgrounds under the context of international migration experience. The current research will examine whether studying abroad experience reduces essentialist thinking about national groups in particular, by exposing individuals to greater within-group variability and between-group similarity.

Overview of The Current Research
To address the above questions, I conducted three studies to investigate how culture and personal experience predict individual differences in psychological essentialism. Study 1 aimed to examine essentialist beliefs about crime concepts, with a particular focus on how formal education in criminal justice affects essentialist thinking. I presented to a group of university students with or without formal training in criminal justice a list of crime vignettes, and asked them to make simple culpability and sentencing decisions for each case. Essentialist beliefs were measured using an adapted essentialism scale from previous studies (Haslam et al., 2000), and were compared across the two samples. I predicted that: 1) students with criminal justice knowledge would show lower level of essentialist thinking; and that 2) essentialist thinking about crime concepts would predict both culpability and sentencing judgments.
Study 2 aimed to examine essentialist beliefs about medical and mental disorders, with a particular focus on how culture affects essentialist thinking. A group of American and Chinese university students viewed four clinical vignettes describing individuals with typical depression and anxiety symptoms, and were asked to make simple diagnosis and treatment decisions. Their essentialist beliefs about a list of medical and mental disorders were measured using an adapted essentialism scale (Haslam et al., 2006) and were compared across the two cultural samples. I predicted that: 1) Chinese adults would show higher level of essentialist thinking than American adults; and 2) stronger essentialist beliefs about mental disorders would be associated with lower perceived psychological normality, higher likelihood of diagnosis judgment, and higher need for treatment perceptions.

Study 3 aimed to examine essentialist beliefs about national groups, with a particular focus on how multicultural living experience affects essentialist thinking. Cross-sectional comparisons were conducted between American and Chinese university students studying domestically and internationally in USA and China. Essentialist beliefs were measured using the Switched-at-Birth paradigm, as well as the social essentialism scale (Haslam et al., 2000). I predicted that international studying experience would decrease essentialist thinking in both samples, and on both essentialist measures.

The following chapters will present the three studies in more details. Overall, the goal of the current research is to explore empirical evidence demonstrating cultural and experience-based difference patterns in essentialist thinking.
Essentialist Thinking Predicts Culpability Judgments and Sentencing Decisions: Evidence from Lay Participants and Criminal Justice Majors

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Abstract

A large body of research suggests that legal decision-making is affected by pervasive cognitive biases. The current paper proposes that psychological essentialism, a commonly endorsed cognitive framework to understand concepts, plays a role in culpability judgment and sentencing decisions. We invited university students to read crime vignettes and measured their essentialist beliefs about abstract crime concepts. Results showed an expert effect such that students with training in criminal justice displayed weaker essentialist beliefs on crimes than those without. Further, multiple regression analyses revealed that essentialist beliefs predicted both culpability and sentencing decisions in lay participants, controlling for contextual factors of the crime vignettes. Interestingly, this pattern was absent in students with criminal justice knowledge. The current findings provide important empirical evidence on how culpability and sentencing decisions are systematically influenced by intuitive beliefs about crime concepts.

Keywords: Psychological Essentialism, Crime, Culpability Judgment, Sentencing Decisions, Expertise
Essentialist Thinking Predicts Culpability Judgments and Sentencing Decisions: Evidence from Lay Participants and Criminal Justice Majors

Introduction

Conviction and sentencing are two of the most important decisions made within the criminal justice system. As critical as the question of how legal decisions ought to be made, it is of no less importance to examine how these decisions are actually made—by legislators, judges and jury members—and particularly, in what ways such a decision-making process is biased by factors outside of law and fact. Below we will briefly review the common law principles guiding conviction and sentencing rulings, and propose psychological essentialism as a cognitive framework that may systematically bias the culpability and punishment decision-making process.

In principle, legal decisions about culpability (the degree to which an individual is guilty of a crime) are based on the concurrence of both actus reus (the criminal conduct) and mens rea (the criminal intent) to cause a prohibited harm (Lippman, 2005). In short, the common law standard directs that culpability should be dependent on whether a criminal act was committed, and the degree to which it was done so intentionally. Legal decisions about punishment typically represent a tradeoff between the potentially competing goals of retribution—the view that punishment should be made proportional to the magnitude of the harm it caused (Vidmar & Miller, 1980; Reyna & Weiner, 2001; Carlsmith & Darley, 2008) and restoration—the view that punishment should aim to rehabilitate offenders, promoting reconciliation with their victims, and thereby prevent future crimes (Kraus & Keltner, 2013). For example, in its recent criminal sentencing guidelines, the Superior Court of Massachusetts explicitly asks judges to impose sentences that “seek to achieve offender rehabilitation”, within the range of being “proportionate to the gravity of the offenses, the harms done and the blameworthiness of offenders” (The Superior Court of Massachusetts, 2016), thereby combining elements of both the retributive and restorative views.

However, legal decisions are rendered by humans, who are susceptible to a range of systematic cognitive biases (e.g., Tversky & Kahneman, 1974). As such, legal decisions are no less vulnerable to cognitive biases and heuristics (Vidmar, 2011; Peer & Gamliel, 2013). For example, both laypersons and police officers have been shown to selectively search for evidence that confirms their preliminary judgments while disregarding evidence that supports alternative assumptions (e.g., Ask & Granhag, 2005; Rassin et al., 2010). Likewise, outcome information affected mock jurors’ judgments of foreseeability on hazardous accidents, which, in turn, altered their beliefs about defendant’s mental states prior to the event (Hastie et al., 1999; Harley, 2007). Other studies have demonstrated the conjunction fallacy among
attorneys on overestimating the probability of trial outcomes described in greater details (Fox & Birke, 2002), anchoring effects among experienced judges on granting compensatory damage awards (Guthrie et al., 2001) or deciding lengths of sentences (Englich & Mussweiler, 2001), and even an effect of proximity to lunch breaks on judges’ parole decisions (Danziger, Levav & Avnaim-Pesso, 2011). Taken together, these results demonstrate that judicial decisions made by both lay people and judicial professionals are susceptible to cognitive biases as well as exogenous factors beyond law and fact.

Essentialist Thinking about Crime Categories

In this paper, we propose that a basic characteristic of how people represent many concepts—psychological essentialism—may be another factor that systematically affects crime-related decision making. Psychological essentialism is the idea that underlying nonobvious properties ultimately determine category membership and give rise to observable properties (Medin & Ortony, 1989; Gelman, Coley & Gottfried, 1994; Ahn et al., 2001; Gelman, 2004). On this view, concepts are not merely lists of features, but include beliefs about how and why those features arise. Essentialist thinking about concepts has a number of consequences; for example, essentialized categories should be perceived to be relatively immutable (i.e., category membership is fixed, and impervious to superficial changes), informative (i.e., properties true of one member should be true of others), natural (i.e., objective and universal rather than socially constructed), and with discrete boundaries. A large body of research has discussed essentialist thinking about biological kinds (e.g., Gelman & Wellman, 1991; Atran, 1998; Coley & Tanner, 2012) and social groups (e.g., Haslam et al, 2000; Heyman & Giles, 2006; Pauker et al., 2016; Rhodes et al., 2017). These studies have primarily focused on essentialist thinking about concrete targets like plants, animals, and people; far fewer studies have investigated how essentialist thinking might apply to more abstract concepts. In one such study, Lindquist et al. (2013) revealed essentialist thinking about emotion categories. Specifically, participants widely endorsed the assumption that emotion categories have discrete boundaries and are defined by an underlying shared essence. This suggests that essentialist thinking may not be limited to tangible concepts and raises the possibility that other abstract concepts may be essentialized. To explore this possibility, I focus on a domain of abstract concepts with especially important societal implication: crime concepts.

If psychological essentialism reflects a cross-domain mechanism for representing conceptual knowledge, it might be intuitively applied to understanding crime concepts as it is to understanding living kinds, social kinds, or emotions. An essentialist understanding of crime concepts could involve a number of beliefs, including (1) the belief in an underlying essence for a given category of crime, (2) the belief that crimes are objective instead of socially constructed, (3) the belief that crime definitions do not vary culturally or across history, (4) the belief that types of crimes have absolute, well-defined boundaries that
make them distinct from all other types of crimes, (5) the belief that different instances of the same crime should be relatively uniform with respect to important features, and therefore, (6) the belief that just hearing the generic label of a crime should allow us to make rich inferences about any particular instance.

For example, an essentialist view of murder might lead to assumptions that murder contains underlying components (moral values, instantiation format, intentions, etc.) that qualify it as murder, the definition of which was naturally determined and pre-existent before being documented by criminal justice theorists and legislators. Established a priori, what constitutes a murder should be held constant across social contexts and throughout historical periods. Whether or not an act constitutes the crime of murder should be black and white, not subject to the context of decision-making or change of time. All murder cases shall share necessary features in common; under no circumstances can one act of murder be seen as something else. Alternatively, a non-essentialist view of murder would consider the concept of murder as being arbitrarily constructed by the human society, for which definitions could vary across societies and historical periods. A non-essentialist account does not acknowledge an absolute, objective underlying core that determines the content of murder and justifies its jurisprudence. Acts could be considered murder to varying degrees without necessarily sharing critical features with one another, and consequently, learning that a particular act was a “murder” would not necessarily be very informative about details of the act. The distinction between an essentialist and non-essentialist view on a given act may reflect the different ways in which people make moral judgments. According to the Social Domain Theory (Turiel, 1983, 2006), children make moral reasoning in three different domains: moral, societal and psychological. Previous studies have shown that children as young as 2-5 years old were quite able to distinguish between moral transgressions and violations of societal rules (Helwig, Tisak & Turiel, 1990). They view some acts as inherently and universally wrong whereas others being dependent on social contexts. This evidence suggested that children were inclined to essentialize moral wrongness with some concepts but not others. Applying the framework of psychological essentialism to crime concepts allows us to reexamine the Social Domain Theory and to investigate the cognitive mechanisms underlying different types of moral judgments.

There is reason to believe that essentialist thinking about crime categories is not just an epistemological issue of conceptual representation, but may have important consequences for legal decision-making. Presumably, essentialized concepts about crimes may increase perceived culpability for criminal acts. The more one sees a crime as forbidden by the natural law instead of simply being regulated by a single society, the more likely that they see the act as being inherently “wrong”, detestable and blameworthy. For an essentialist thinker, the “fact” (to the extent they believe so) that the definition of a crime is absolute, clear-cut and universally endorsed across human societies might compel them to perceive the act as more culpable, and thus more deserving of punishment by nature. In contrast, we
speculate that one with an anti-essentialist perspective sees crimes as defined by an arbitrary group of legislators or by social convention, without inherent and absolute moral wrongness embedded, would take a more lenient view on criminal behaviors, thus perceiving individuals engaging in them as less culpable and punishable.

We are aware of the very little empirical work on essentialist beliefs in the context of criminal justice. The few studies that have been done focus on essentialist beliefs about individuals who commit crimes. For example, previous research has studied common beliefs about genetic abnormality as the underlying cause of criminal behavior, and demonstrated that presenting evidence supporting biological mechanisms of psychopathy significantly increased trial judges’ listing of mitigating factors and reduced sentencing (Aspinwall, Brown & Tabery, 2012). Attributing criminal behaviors to an underlying genetic account (as the criminal “essence”) may also alter perceptions of culpability (Dar-Nimrod & Heine, 2011), as physiological causes are often considered automatic and involuntary (Monterosso, Royzman & Schwartz, 2005). In contrast, essentialist thinking about groups of people (e.g., social class categories) was associated with endorsement of harsher punitive policies on academic cheating behaviors and financial crimes (Kraus & Keltner, 2013). However, as with most previous research to our knowledge, these studies did not question whether people reason essentially about the abstract crime concepts, nor how that may influence perceptions on culpability and punishment decisions.

The Current Study
The current study aims to explore how people may utilize essentialist thinking when reasoning about crime concepts, and how essentialist beliefs play a role in culpability judgment and punishment decisions. We presented participants with a wide range of crime vignettes that varied on three factors: detrimental consequences of the action, malicious intention of the protagonist, and the violence of the act. Participants rated these vignettes for perceived culpability of the protagonist and suggested a punishment quantified by the length of sentencing. We also adapted a measure of essentialist thinking (Haslam et al., 2000) to assess the degree to which individuals essentialized a set of crime categories.

We hypothesized that the three situational factors—consequence, intent, and violence—would all predict culpability and punishment decisions. From the Code of Hammurabi to the Law of Moses, the spirit of retributive justice (e.g., “an eye for an eye, a tooth for a tooth”) requires adjudication and punishment to be proportionate to the harm that has been caused. In addition to consequence, previous literature suggested that malicious intent plays a critical role in moral judgment, especially in older children and adults (Costanzo et al., 1973; Cushman, 2008), who see harmful intention alone as sufficient to grant moral wrongness. Recent fMRI evidence confirmed that brain regions responsible for mental state reasoning were actively engaged in moral judgments about harmful acts (Chakroff et al., 2016).
Moreover, previous studies suggested that emotional salience presented in a moral dilemma largely influences participants’ moral judgment. Holding consequence and intention constant, simply increasing the level of emotional salience by adding personal confrontation (or perceived violence) to the picture decreased participants’ utilitarian tendency to make moral decisions solely based on the calculation of outcomes (Greene et al., 2001).

Our central research question was whether essentialist thinking about crime categories influenced decisions about culpability and punishment above and beyond these other potentially relevant factors. We hypothesized that stronger endorsement of essentialist beliefs would be associated with higher culpability and punishment ratings.

**Study 1a**

**Method**

**Participants.** 52 undergraduate students (30 male, 22 female) recruited from a psychology participant pool of a private university in the Northeast USA completed Study 1a for course credit. The mean age of participants was 19.0 years (SD=.91). The racial distribution of the participants was 62% Caucasian, 21% Asian, 12% Hispanic/Latino and 6% other. Most participants were from relatively affluent families; 54% came from households with annual incomes greater than $100,000. On the religious aspect, 36% of the participants self-identified as Christian/Catholic, 19% as atheist, 6% as Muslim, 4% as Jewish, 2% as Buddhist, and 33% as “Other”. The majority of the participants (67%) self-identified as liberal while only 12% self-identified as conservative. The data for Study 1a were collected in Spring 2016.

**Materials.**

**Crime vignettes.** For each of eight crime categories (Murder, Theft, Arson, Rape, Robbery, Burglary, Embezzlement and Drug Violation), we designed four short fictional vignettes about an individual engaging in a crime-like behavior, for a total of 32 vignettes. For instance, one murder vignette read as follows:

*A man is driving home from movie late at night. He is sending a text message when the car hits someone crossing the road. He is so scared that he drives away. The injured man dies the next day because of excessive loss of blood.*

Within each crime category, the four vignettes varied with respect to malicious intention of the protagonist, violence of the act, and detrimental consequences of the action, three factors both normatively and empirically relevant to decision-making about culpability and punishment. A complete list of vignettes is provided in the Appendix.
**Essentialism scales.** In order to measure participants’ essence-related beliefs about crimes, we used the essentialism scales adapted from Haslam’s work on social essentialism (e.g., Haslam et al., 2000). This includes 9 individual items which together capture two dimensions of essentialism: naturalness and entitativity (which we will henceforth refer to as “cohesiveness”). *Naturalness* refers to the extent to which a given category is regarded as objective, discovered, sharply bounded, and invariant across time and place, and includes specific items indexing *naturalness, necessity, stability, immutability,* and *discreteness.* *Cohesiveness* refers to the degree to which categories members are seen as homogeneous, and categories as having inductive potential; this dimension includes specific items indexing *uniformity, exclusivity, informativeness,* and *inherence.* We modified the original items slightly to assess essentialist thinking about crime categories; wording of all items is presented in Table 1. Participants rated each crime category on each of the 9 essentialism items. Responses were given on a scale ranging from 1 (completely disagree) to 9 (completely agree); for all scales, higher numbers represented stronger essentialist responses.

**Table 1.** Wording for the Essentialism Scale on Crime Categories, Studies 1a & 1b.

<table>
<thead>
<tr>
<th>Item</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Naturalness Dimension</strong></td>
<td></td>
</tr>
<tr>
<td>Naturalness</td>
<td>[Name of crime] exists in the natural world; it's naturally defined, not invented or labeled by the human society.</td>
</tr>
<tr>
<td>Necessity</td>
<td>There are certain features necessary for an act to be considered [name of crime].</td>
</tr>
<tr>
<td>Stability</td>
<td>The definition of [name of crime] is stable across cultures and throughout history.</td>
</tr>
<tr>
<td>Discreteness</td>
<td>[Name of crime] is black and white. It is easy to tell if an act is [name of crime] or not.</td>
</tr>
<tr>
<td>Immutability</td>
<td>If an act is considered [name of crime] in one instance, it will always be considered [name of crime].</td>
</tr>
<tr>
<td><strong>Cohesiveness Dimension</strong></td>
<td></td>
</tr>
<tr>
<td>Uniformity</td>
<td>All acts of [name of crime] are pretty similar and share many features in common.</td>
</tr>
<tr>
<td>Inherence</td>
<td>All acts of [name of crime] share something deep in common, even though they may look different across scenarios.</td>
</tr>
<tr>
<td>Exclusivity</td>
<td>If an act is [name of crime], it is [name of crime] and only [name of crime]. It cannot be classified as another type of crime.</td>
</tr>
<tr>
<td>Informativeness</td>
<td>Knowing that an act is [name of crime] tells us a lot about what had happened.</td>
</tr>
</tbody>
</table>
Design & Procedure. Study 1a was presented online using Qualtrics survey software (Qualtrics, Provo, UT). Participants received a web link to the online questionnaire, and completed the survey at a time and place of their convenience. The consent form was presented on the first screen, and participants clicked on ‘YES’ to indicate their eligibility and willingness to continue. In the first task, participants were presented with eight crime vignettes (one randomly selected version for each crime type) in a random order. After reading each crime vignette, participants were asked to rate the perceived culpability of the individual on a 1-9 scale (1= Not Culpable, 9= Highly Culpable) as well as to make a sentencing decision to punish the individual, choosing on a slider between 0-50 years of prison. This same procedure was repeated for each vignette. Once finished, participants then completed the Essentialism Scale for Crime Concepts. Participants completed the nine-item essentialism scale for each crime category, blocked by crime category. Both the order of the crime blocks and the item order within each block was randomized. Lastly, participants reported demographic information and were debriefed and thanked. Participants completed the study in about 30 minutes.

Results

Scoring.

Essentialism ratings. To look at essentialist ratings, we computed a naturalness and cohesiveness index for each participant per crime categories. The naturalness dimension index was generated by averaging ratings on the 5 naturalness scales (Naturalness, Necessity, Discreteness, Immutability, and Stability). The cohesiveness dimension index was generated by averaging ratings on the 4 cohesiveness scales (Uniformity, Exclusivity, Inherence and Informativeness; see Table 1). For each dimension index, scores range from 1-9 with higher scores representing stronger essentialist beliefs about the naturalness or cohesiveness of the crime category.

Culpability and Punishment Ratings. Participants’ ratings of culpability from each crime vignette were scored from 1 (Not Culpable) to 9 (Highly Culpable). Participants’ punishment ratings were scored from 0 to 50 (years of prison).

Malicious Intent, Violence, and Detrimental Consequence Ratings. Five raters independently rated all 32 crime vignettes on malicious intention, violence, and detrimental consequences factors using a scale that ranged from 0 to 10. Based on the high inter-rater reliability (Cronbach’s alpha=.95 for malicious intention, alpha=.93 for violence, and alpha=.95 for detrimental consequences), we averaged ratings on each factor for each vignette, yielding three ratings for each vignette. A complete listing of vignettes and ratings is presented in Appendix.

Essentialist ratings of crime categories. Table 2 shows the mean naturalness and cohesiveness ratings for each crime category in Study 1a. One-sample t-tests were conducted to assess the degree to
which mean essentialist ratings deviated from the midpoint of the scale (5.0). Results confirmed that naturalness ratings on all crime types except for Embezzlement and Drug Violations were above the midpoint of the scale (ps<.01), suggesting a positive tendency to endorse naturalness statements about crimes in general. On the other hand, results on the cohesiveness ratings revealed a relatively weaker essentialist tendency, with only Embezzlement (t_{51}=2.31, p=.025) and Arson (t_{51}=2.50, p=.016) showing mean ratings above the midpoint.

Table 2. Mean Essentialist Ratings (on Naturalness and Cohesiveness Dimensions) for Crime Categories, Study 1a (General Student Population) and Study 1b (Criminal Justice Majors).

<table>
<thead>
<tr>
<th>Crime Type</th>
<th>General Student Population (Study 1a)</th>
<th>Criminal Justice Majors (Study 1b)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Naturalness</td>
<td>Cohesiveness</td>
</tr>
<tr>
<td>Rape</td>
<td>5.58**(1.47)</td>
<td>5.27(1.71)</td>
</tr>
<tr>
<td>Arson</td>
<td>5.71***(1.38)</td>
<td>5.56*(1.61)</td>
</tr>
<tr>
<td>Murder</td>
<td>6.15***(1.55)</td>
<td>5.38(2.05)</td>
</tr>
<tr>
<td>Theft</td>
<td>5.93***(1.38)</td>
<td>5.21(1.66)</td>
</tr>
<tr>
<td>Robbery</td>
<td>5.91***(1.46)</td>
<td>5.15(1.64)</td>
</tr>
<tr>
<td>Burglary</td>
<td>5.86***(1.48)</td>
<td>5.25(1.57)</td>
</tr>
<tr>
<td>Embezzlement</td>
<td>5.14(1.62)</td>
<td>5.57*(1.79)</td>
</tr>
<tr>
<td>Drug</td>
<td>4.81(1.50)</td>
<td>4.84(1.58)</td>
</tr>
</tbody>
</table>

Note: Ratings represent averages of 5 (naturalness) or 4 (cohesiveness) scales, and can range from 1 to 9, with higher scores representing stronger essentialist beliefs. Symbols indicate that mean scores differed significantly by one-way t-test from the scale midpoint (5.0): † p<0.10; *p<0.05; **p<0.01; ***p<0.001.

**Effects of essentialist beliefs on culpability judgments.** In order to examine the hypothesized relationship between essentialist beliefs and culpability judgments, we computed a mean culpability rating for each crime vignette across participants. We also computed mean naturalness and cohesiveness indexes for each crime type. We then regressed the mean culpability rating on the two essentialism indexes of the corresponding crime, together with intent, violence, and consequences ratings for each vignette as predictors. Item-wise multiple regression analysis showed that this model reached statistical significance (F_{5,26}=4.739, p=.003, R^2=.48, see Table 3). Specifically, culpability judgments were strongly predicted by consequence (β=.47, p=.008) and marginally predicted by intent (β=.31, p=.056). Both higher malicious intention of the transgressor and more severe consequences of the act led to higher culpability judgments. Critically, essentialist beliefs about the naturalness of crime categories constituted
an additional predictor of perceived culpability ($\beta=.43, p=.049$) even when controlling for the malicious intent, consequences, and violence. This result suggests that essentialist thinking about crime categories made an independent contribution to culpability judgments; the more a crime is believed to be natural, objective, and stable, the more likely it is that an individual who commits this type of crime will be seen as culpable. Violence and essentialist beliefs about cohesiveness, on the other hand, were unrelated to culpability decisions in this sample.

**Table 3. Predictors of Culpability Judgments and Sentencing Decisions, Study 1a & 1b.**

<table>
<thead>
<tr>
<th>Decision</th>
<th>Predictors</th>
<th>Intent</th>
<th>Violence</th>
<th>Consequence</th>
<th>Essentialism: Naturalness</th>
<th>Essentialism: Cohesiveness</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 1a: General Student population</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culpability</td>
<td></td>
<td>.306†</td>
<td>.041</td>
<td>.471**</td>
<td>.434*</td>
<td>-.152</td>
<td>.477**</td>
</tr>
<tr>
<td>Sentencing</td>
<td></td>
<td>.137</td>
<td>.653***</td>
<td>.274*</td>
<td>.456**</td>
<td>.749***</td>
<td></td>
</tr>
<tr>
<td>Study 1b: Criminal Justice Students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culpability</td>
<td></td>
<td>.274†</td>
<td>.163</td>
<td>.504**</td>
<td>-.025</td>
<td>.149</td>
<td>.523***</td>
</tr>
<tr>
<td>Sentencing</td>
<td></td>
<td>.159</td>
<td>.570***</td>
<td>.310*</td>
<td>.018</td>
<td>-.033</td>
<td>.640***</td>
</tr>
</tbody>
</table>

Note: Entries represent standardized regression coefficients ($\beta$). For ease of interpretation, significant or marginally significant entries are marked in bold. † $p < 0.10$; *$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$.

**Effects of essentialist beliefs on sentencing decisions.** In order to examine the relationship between essentialist beliefs and sentencing decisions, we averaged the sentencing responses for each crime vignette and regressed it on intent, violence, consequences, together with naturalness and cohesiveness index as predictors (see Table 3). This model again reached statistical significance ($F_{5,26}=15.500, p<.001, R^2=.75$). Sentencing decisions were reliably predicted by violence level ($\beta=.65, p<.001$) and detrimental consequences ($\beta=.27, p=.023$) described in the vignette. Specifically, punishment decisions increased in length with increased violence level and more severe consequences. Most notably, essentialist beliefs about the cohesiveness of crime categories also predicted sentencing decisions ($\beta=.46, p=.003$). This result suggests that essentialist thinking about crime categories made an independent contribution to sentencing decisions; the more that instances of a type of crime are believed to have uniform features and share deep commonalities across contexts, the more harshly people tend to punish the individual who committed that crime. Intent and beliefs about naturalness were unrelated to sentencing decisions in this sample.
Discussion
Study 1a tested essence-related beliefs about crimes in lay participants and explored its relations to intuitive judgments on culpability and punishment. Most critically, the results of Study 1a demonstrated that, for a sample drawn from a general undergraduate population, essentialist beliefs about crime categories predict both culpability and punishment decisions above and beyond other situational factors such as intent, consequences, and violence. Specifically, culpability judgements were predicted by seriousness of the consequences and the protagonist’s malicious intention, but essentialist beliefs about the naturalness of crimes explained variance while the effects of these factors were held constant. Likewise, punishment decisions were predicted by seriousness of the consequences and violence of the act, but essentialist beliefs about the cohesiveness of crimes explained variance above and beyond these factors. These results demonstrate that legal decision-making was affected by essentialist beliefs. This finding is important in extending previous literature and identifying a new predictor of legal decision-making beyond the scope of current theoretical frameworks. Intriguingly, in our results, culpability and sentencing decisions were predicted by different dimensions of essentialist thinking. The naturalness dimension of essentialist beliefs about crimes seems to be more relevant in predicting culpability decisions, whereas the cohesiveness dimension seems be more important when forming sentencing decisions.

Study 1b
Results from Study 1a suggested that essentialist beliefs about crime concepts may influence culpability and punishment decision-making. A remaining question is whether this reasoning pattern we see from the lay participants is generalizable to those with more expertise in criminal justice. Theoretically, this question is meaningful for us to understand the extent to which expertise can and does override intuitive belief systems that people start out with. On the one hand, previous literature suggested that formal training not only adds on special skills or knowledge in a given field, but also alters the way that people organize their thinking. For example, it was shown that biology professors categorized biology concepts based on their deeper, abstract relations whereas non biology-major students did so based on superficial features (Smith et al., 2013). Likewise, commercial fishermen relied on ecological factors when sorting marine species whereas novices simply attended to the appearance (Shafto & Coley, 2003). However, on the other hand, studies suggest that formal education may suppress, but does not overwrite, intuitive thinking. For example, Shtulman and Valcarcel (2012) asked a group of senior scientists to verify scientific statements that were either consistent or inconsistent with intuitions. Results showed that even after extensive formal training, scientists were much slower and less accurate when evaluating true statements that involve counter-intuitive elements (see also Coley & Eidson, 2014; Kelemen, Rottman &
Seston, 2013; Goldberg & Thompson-Schill, 2009 for further evidence of intuitive knowledge as a persistent cognitive default).

Study 1b aims to test whether formal training in the domain of criminal justice has any impact on the degree to which intuitive thinking affects culpability and punishment judgments. To do so, we presented the same measures from Study 1a to a group of undergraduate students engaged in formal studies of criminal justice. From a practical perspective, adding a more formally trained group is important as legal decision-makers include both lay people (jury members) and legal experts (judges, attorneys, police officers). Results from Study 1b will further inform us on the extent to which intuitive beliefs can affect substantial justice in criminal court.

Method
Participants. 62 undergraduate students (20 male, 41 female, 1 self-identified as other) with a major or minor in criminal justice (henceforth, “CJ students”) from a private university in the northeast USA were recruited from three criminal justice courses: Criminal Law, Law & Society and Law & Psychology. Each of these courses are upper level elective courses open to juniors and seniors who are actively pursuing majors or minors in Criminal Justice and/or Psychology and who have completed various prerequisite courses inclusive of Introduction to Criminal Justice. The mean age of participants was 21.8 years (SD=2.39). The racial breakdown of the participants for Study 1b was as follows: 73% Caucasian, 8% Asian, 6% African American, 2% Hispanic/Latino and 11% others (including mixed race). 50.0% of the participants reported annual household incomes of above $75,000; 45% of the participants self-identified as Christian/Catholic, 8% as Jewish, 39% as atheist or no religious belief, and 8% as others. With respect to political stance, 40% of the participants self-identified as liberal, 21% of the participants self-identified as conservative, and 39% as independent or others. On average, participants reported having taken 6.8 (SD=4.55) courses in criminal justice (not including the class in which they were being surveyed) at the time of the study. Data for Study 1b were collected in Spring 2017.

Materials & Design. Study 1b employed a paper-and-pencil version of the vignettes and essentialism measures used in Study 1a. Due to class time constraints, each participant rated four rather than eight vignettes, and then provided essentialist ratings for the same four crime types (rather than all eight). Each participant was given one of eight fixed random combinations of four crime vignettes, presented in fixed randomized order. Across versions, each crime appeared the same number of times. Essentialist scales were blocked by crime category, and presented in fixed randomized order.

Procedure. We distributed the survey in three criminal justice undergraduate level classrooms with the approval of the class instructors. As in Study 1a, in the first task, after reading each crime vignette, participants made culpability and punishment decisions. In the second task, participants rated
each crime category on all nine essentialism scales. It was made clear to the participants that they should not base their responses on their criminal justice related knowledge, but rather their personal opinions. Participants completed the survey in about 15 minutes. After the survey was collected, participants were debriefed and provided the opportunity to follow up with the researcher to learn more details.

**Results**

**Scoring.** Intent, violence, and consequence ratings for each vignette were the same as used in Study 1a. Culpability and punishment ratings for vignettes, and essentialist beliefs about crime categories, were quantified as in Study 1a.

**Essentialist ratings of crime categories.** Table 2 shows the mean naturalness and cohesiveness ratings for each crime category in Study 1b. As in Study 1a, we conducted one-sample t-tests to assess the degree to which mean essentialist ratings deviated from the midpoint of the scale (5.0). In contrast to Study 1a, only Murder was marginally above the midpoint of the scale ($t_{31}=2.00, p=.054$); naturalness ratings for Rape ($t_{32}=2.04, p=.050$) and Drug Violations ($t_{28}=4.26, p<.001$) were significantly below the midpoint, indicating a tendency towards non-essentialist views. Similarly, CJ students’ cohesiveness ratings on only one crime- Embezzlement- were significantly above the midpoint of the scale ($t_{29}=2.42, p=.022$). Again, CJ students’ cohesiveness ratings on Drug Violations fell below the midpoint of the scale, indicating a non-essentialist view ($t_{28}=4.04, p<.001$).

To compare essentialism ratings for CJ students to those for general students, we computed mean naturalness and cohesiveness ratings for each student, and conducted independent sample t-tests. Results showed that mean naturalness ratings from CJ students were significantly lower than those from general students, $t_{112}=3.62, p<.001$, Cohen’s $d=0.68$, and their cohesiveness ratings were marginally lower, $t_{112}=1.81, p=0.073$, Cohen’s $d=0.34$. Overall, CJ students showed weaker essentialist reasoning about crime categories than students from the general population, see Figure 1.
Effects of essentialist beliefs on culpability judgments. Mean culpability judgments for CJ students did not differ from students from the general population ($t_{112}=1.27, p>.1$). In order to test the hypothesized association between essentialist beliefs and perceived culpability, we again computed a mean naturalness and cohesiveness rating, as well as a mean culpability rating for each crime vignette. We then regressed the mean culpability rating on the two essentialism indexes of the corresponding crime, together with intent, violence, and consequences ratings for each vignette. The model again reached statistical significance ($F_{5,26}=5.708, p=.001, R^2=.52$, see Table 3 above). Precisely as we observed in the general undergraduate sample in Study 1a, culpability judgments were predicted by intent (marginally, $\beta=.27, p=.071$) and consequences ($\beta=.50, p=.003$). Critically, in contrast to the general undergraduate sample in Study 1a, neither essentialist score predicted culpability ratings for criminal justice majors.

Effects of essentialist beliefs on sentencing decisions. Mean length of sentencing decisions for CJ students did not differ from students from the general population ($t_{111}=0.74, p>.1$). In order to test the hypothesized association between essentialist beliefs and sentencing decisions, we again computed mean naturalness and cohesiveness ratings, as well as a mean sentence length for each crime vignette. We then regressed the mean sentence length on the two essentialism indexes of the corresponding crime, together with intent, violence, and consequences ratings for each vignette. This model reached statistical significance ($F_{5,26}=9.242, p<.001, R^2=.64$, see Table 3). Once again, precisely as we observed in the general undergraduate sample in Study 1a, sentencing decisions were reliably predicted by violence.
(β=.57, p<.001) and consequences (β=.31, p=.031). However, in contrast to the general undergraduate sample in Study 1a, neither essentialist score predicted sentencing decisions for criminal justice majors.

Discussion

Study 1b tested essence related beliefs about crimes among students who were formally studying criminal justice. The comparison between the CJ students and general student participants revealed three important findings. First, CJ students showed significantly weaker essentialist reasoning than lay participants. Second, CJ students showed the same pattern of relations between situational factors and culpability and punishment decisions as general student participants (intent and consequences predicted culpability; violence and consequences predicted sentencing). And finally, in contrast to students from the general population, essentialist ratings from CJ students were unrelated to either culpability or punishment decisions. In sum, students who have developed a certain level of expertise in the field of criminal justice seem to be better at bypassing intuitive heuristics like essentialist thinking when making culpability judgments and punishment decisions. We will discuss the interpretation of these results and their implications in the following general discussion section.

General Discussion

The current studies explored essentialist thinking about crime categories among students with and without formal training in criminal justice, and how such thinking influenced culpability judgments and sentencing decisions. We presented students with a range of crime vignettes varying on three relevant situational factors (intent, consequence and violence), asked them to report their perceived culpability and punishment decision for each vignette, and measured their essentialist belief for each type of crime. Results showed that situational factors predicted both groups’ culpability and punishment decisions in precisely the same way, and that essentialist beliefs reliably predicted culpability and punishment decisions in students from the general population but not in CJ students.

Factors Predicting Culpability Judgements and Sentencing Decisions

Situational Factors. In both samples, culpability judgments were consistently predicted by the degree that the protagonist was seen as harboring malicious intent, and the seriousness of the consequences of the protagonist’s action. Degree of violence was unrelated to judgments of guilt in either population. This finding is generally consistent with the common law grounds on criminality, which sees the concurrence of actus reus (the criminal conduct) and mens rea (the criminal intent) as necessary components to constitute a crime. Consideration on the four levels of mens rea (purposely, knowingly, recklessly and negligently) often determines the crime type. For example, the same killing act would be
categorized as first degree murder if it was conducted purposely, or manslaughter, if conducted negligently. Previous studies demonstrated that judges who are presented with biological evidence of psychopathy in a hypothetical case list more mitigating factors in their decision, and opt for shorter punishments, than those who are not provided such evidence (Aspinwall, Brown & Tabery, 2012), presumably because a biological mechanism reduces intent. Although CJ students might be aware of these formal distinctions, students from the general population are unlikely to have such technical knowledge. As such, this finding suggests that the common law principles on culpability are well aligned with people’s intuitive sense of guilt. This fact is important to address, as previous studies suggested that the extent to which legal system aligns with people’s intuitions of justice is an important predictor of voluntary compliance of the law (Carlsmith, Darley & Robinson, 2002; Tyler, 1990).

Like culpability judgments, sentencing decisions were consistently predicted by the seriousness of the consequences of the protagonist’s action. Unlike culpability judgments, harsher sentences were meted out by both populations for more violent acts. And unlike culpability judgments, sentencing decisions were unrelated to the malicious intent of the protagonist. This pattern of results suggests that punishment decisions were driven by a retributive rather than rehabilitation perspective. Specifically, the importance of detrimental consequences in punishment decisions closely aligns with the retributive account, which justifies legal punishment as being proportional to the harm it has caused. Additionally, the fact that malicious intent was not related to punishment decisions runs counter to the rehabilitation perspective, wherein the lack of malicious intent should be deemed a mitigating factor by signaling a reduced likelihood of recidivism, and therefore an increased likelihood of rehabilitation. More violent criminal acts were also punished more harshly, which is consistent with current legal doctrine (for example the sentencing guidelines of Massachusetts Superior Court) that asks judges to impose sentences that are proportionate to the “gravity” of the offense. Relatedly, highly violent acts may be likely to evoke strong emotional antipathy, thus lead participants to make harsher punishments. As suggested by previous literature, moral outrage significantly predicted punitive intent, that primed anger led to harsher punishment on harmful acts (Lerner, Goldberg & Tetlock, 1998). In sum, punishment decisions seem to reflect an emphasis on retributive rather than restorative justice.

**Essentialist Thinking.** A primary novel contribution of these studies is the finding that for students from the general population, essentialist thinking predicted significant variance in both culpability judgements and sentencing decisions above and beyond the situational factors discussed above. Specifically, beliefs about the *naturalness* of crime categories predicted culpability judgments, whereas beliefs about the *cohesiveness* of crime categories predicted sentencing decisions. Although we did not predict this specific differential pattern, it clearly shows that essentialist thinking—a basic characteristic of how people represent many concepts—also can be applied to relatively abstract
categories like types of crimes, and critically, that essentialist thinking systematically influences justice-related decision-making among participants from the general population. As a side note, this result also validates Haslam and colleagues’ (2000) two-dimensional model by showing that the dimensions differentially related to decisions about culpability and punishment.

The finding that lay participants judged both culpability and punishment based on their essentialist beliefs about the crime was not entirely unreasonable. In fact, there is rationale to relate the nature of the crime with its culpability and punishability; which is indeed what lay participants did in our study. Presumably, an inherently and universally wrong act should be seen as more condemned and punishable, whereas a less inherently wrong act may deserve less blame and punishment, from a moral account. However, this conclusion has to be based off the assumption that people agree upon, and also have access to quantify the underlying moral “essence” of the crime types- which is, however, a subjective opinion that varies from one individual to another. It is beyond the scope of the current research, as well as the jury’s discretion, to decide whether certain crime types are intrinsically more blameworthy and punishable than others. The duty of the jury is to submit to the legal reality, instead of the subjective reality of moral reasoning, and to use and only use the criteria as was formulated in the current law to make legal decisions. Consideration on any of other additional factors may bring in unforeseeable and unformalizable outcomes, which may lead to the unequal distribution of justice among cases. It is from this sense that we consider the reliance on essentialist beliefs as a potential cognitive bias in legal decision-making.

Differences between Students Studying Criminal Justice and the General Student Population

A critical question of the current research is whether criminal justice students reason differently from students in the general population about crime concepts. Our results point to some similarities between the two populations. They did not differ with respect to overall culpability judgements or sentencing decisions, and were identical with respect to the situational factors that predicted such judgements. However, our results also point to some clear differences. Overall, CJ students had weaker essentialist beliefs about crimes than students from the general population. This result is consistent with other findings that expertise may lead to reduced essentialist thinking (e.g., Ahn et al., 2006). More strikingly, we found a sharp contrast between the populations with respect to the role of essentialist thinking in judicial decision-making. For students from the general population, both culpability judgments and sentencing decisions were based, in part, on intuitive essentialist beliefs about crime categories, whereas such beliefs played no role in the decisions made by CJ students’ judgements.

Previous literature suggests that expertise not only results in the addition of content knowledge (Chase & Simon, 1973), but also, more critically, shapes higher-order epistemological systems of
conceptual organization (Chi et al., 1981; Smith et al., 2013). The current research provides additional evidence demonstrating the expert effect on cognitive reasoning and further supports the malleability of essentialist thinking. Of course, our evidence precludes any causal interpretation about the effect of formal education on the degree to which students essentialize crime categories; it’s certainly possible, and indeed quite likely, that important differences preexist between students who decide to study criminal justice and those who do not, and essentialist thinking may be one of them. The difference in the role played by intuitive beliefs in culpability and sentencing decisions, however, seems less plausibly a preexisting difference between CJ students and students from the general population, and therefore more plausibly an outcome of formal education in criminal justice.

It is important to note the potential difficulty in applying the results of this study to other perceived criminal justice experts (i.e. judges, lawyers, etc.). The experts as defined by this study were current criminal justice students who received ample time to think critically when making each culpability judgment and sentencing decision. Previous literature has suggested that intuitive thinking, although inhibited by expertise, can reemerge under cognitive load, prompting even experts to fall back on intuitive beliefs when making decisions (Shtulman & Valcarcel, 2012; Kelemen, Rottman & Seston, 2013). Cognitive load may be ubiquitous in the courtroom; for instance, when making decisions about an offender’s guilt or innocence and, subsequently, the length of his or her sentence, it is all but impossible for judges to take the time to evaluate every single piece of relevant information. As such, there is a potential that judges may simply rely on their intuitive essentialist beliefs instead. Accordingly, future research might investigate the effect of cognitive load - perhaps by providing a quantity of information that cannot be fully evaluated within the time frame given - on experts’ decision making.

**Conclusion**

The current findings indicate that essentialist beliefs influence important aspects of legal decision making for a general undergraduate population, but not for a population of students undertaking formal coursework in criminal justice. By demonstrating that people spontaneously essentialize crime categories, in addition to biological and social categories, this research provides further evidence to suggest that essentialist thinking constitutes a domain-general cognitive framework. By demonstrating that formal education in criminal justice can reduce the role of essentialist thinking in legal decision making, this research also provides evidence that such intuitive cognitive construals are malleable and can be influenced by experience.

In addition, although these studies were conducted in the lab and classroom rather than the courtroom, results from the current studies have important implications in criminal justice theory and practices. It is vital to understand how people form culpability and sentencing decisions as these
judgments are central to the functioning of the criminal justice system. The fact that CJ students in our study were not affected by essentialist beliefs when making these decisions should not exempt us from concern. Given the nature of our Constitution, and the 6th Amendment in particular, juries comprised of lay-people but not legal experts, who serve as the deciders of guilt and innocence in criminal cases. Juries are instructed to decide cases based “solely on the evidence presented in the courtroom” (Massachusetts Model Jury Instructions, 34) and not to be influenced by extralegal factors, including their personal feelings, prejudices or sympathy (Maine Model Jury Instructions, Section 3.01, 60). However, findings from the current studies suggest that intuitive essence-related beliefs may in fact play an additional role, above and beyond the evidence presented in the courtroom, in predicting the decision outcome. Thus, it is crucial to further explore to what extent this decision-making process is explicit and controllable.
Running head: ESSENTIALIST BELIEFS ABOUT MENTAL DISORDERS

Paper 2

Essentialist Beliefs about Mental Disorders in U.S and China

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Abstract

Psychological essentialism is a basic cognitive framework that reflects how people represent concepts. Past studies have extensively documented essentialist thinking about natural kinds and social groups, suggesting that psychological essentialism emerges early in childhood and exists widely across an array of societies. The current paper aims to extend previous research on essentialist thinking about mental disorders, and to examine how it differs in western vs. eastern culture. We adapted an essentialism scale from previous studies to measure participants’ essentialist beliefs about a list of mental and medical disorders. In addition, participants made simple diagnosis and need for treatment judgments after viewing short vignettes describing individuals with typical depression and anxiety symptoms. Results showed that American adults gave generally higher essentialist ratings on the naturalness dimension, whereas Chinese adults gave generally higher essentialist ratings on the cohesiveness dimension. Further, need for treatment judgments were positively predicted by naturalness ratings, and negatively predicted by cohesiveness ratings on the relevant mental disorder. The current research shed light on cultural malleability of psychological essentialism, and addressed practical implications of essentialist beliefs in clinical decision-making.

Keywords: Psychological Essentialism, Mental Disorder, Culture, Clinical Decision-Making
Essentialist Beliefs about Mental Disorders in U.S and China

Introduction

Psychological essentialism has been proposed as a common cognitive construct that reflects how people form concepts and categorize the world (Dar-Nimrod & Heine, 2011). Essentialist thinking entails the belief that category membership resides deeply in an underlying essence, which gives rise to uniform category features and discrete category boundaries (Medin & Ortony, 1989; Gelman, 2003). For example, one common lay belief is that racial groups are formed based on biological or genetic features, that members from the same racial group share closely uniform personal features more than members across racial groups do. It is believed to be extremely difficult, if not entirely impossible, for individuals to cross racial boundaries: even if they manage to change superficial features such as hair or skin colors, deep inside their racial “essence” always stays the same. Such essentialist beliefs construct the subjective representation of concepts; however, they may or may not reflect the objective reality of the world.

Previous research has extensively studied essentialist thinking with respect to natural kinds and social groups, and found abundant evidence indicating that essentialist thinking emerges early from childhood (Gelman, 2003), and exists widely across an array of social environments (Dar-Nimrod & Heine, 2011; Haslam, 2017). Although with less attention being paid, researchers have argued that essentialist thinking may constitute an important aspect of lay beliefs about mental disorders, that people view mental disorders as having real underlying essence as natural kinds (Ahn et al., 2006). From a theoretical perspective, some scholarly discussions on mental disorders treated them as discrete categories bounded by unique biological dysfunctions (the “medical model”, Guze,1992; Haslam & Ernst, 2002). Likewise, the Diagnostic and Statistical Manual of Mental Disorders (DSM) was thought to endorse the assumption that the same causes of mental disorders “must present the same symptoms” (Ahn et al., 2006). These documentations were in line with an essentialist view on mental disorders that an underlying essence defines category membership and leads to necessary and uniform category features. These essentialist views are contrasted with the social constructionist view, which refutes the biochemical monocausal model of mental disorders, and argues that mental disorders disqualify the medical-pathological definition for diseases (Benning, 2016). From the social constructionist view, mental disorders are not “real” disease, instead, they are created and labelled by the social norms (e.g., Szasz, 1961; Kiesler, 1999).

In this paper, we endorse the two-dimensional model of essentialism and conceptualize essentialist thinking about mental disorders as reflected in two dimensions: naturalness and cohesiveness. Previous literature suggested that social categories are essentialized in two related yet dissociable
dimensions (Haslam et al., 2000). On the one hand, people may essentialize the category as “real”, or being discovered in the natural world, instead of being constructed by the human society (naturalness). Essentializing categories on the naturalness dimension involves assumptions about discrete and absolute category boundaries, immutable category essence and membership, as well as necessary category features. On the other hand, categories could also be essentialized in the sense of being seen as a coherent, homogenous entity (cohesiveness). Essentializing categories on the cohesiveness dimension involves assumptions about category uniformity, inherent causal reality, and informativeness of category membership. Based on previous theories, we conceptualize essentialist thinking about mental and medical disorders as reflected in the lay beliefs that the disorders are real, natural kinds categories (*naturalness*), and that disorders have uniform underlying causes as well as symptom features (*cohesiveness*).

Previous studies provided empirical evidence on how lay people and clinicians essentialize mental disorders. In Haslam and Ernst’s study (2002), a group of college students read priming materials that addressed one essentialist aspect of mental disorders (as being natural, discrete, immutable, uniform, or informative) and judged the plausibility of the materials on a five-point scale. Results showed that all of the five essentialist priming materials were rated as plausible, and successfully increased participants’ essentialist beliefs about mental disorders in the corresponding aspect. Further, it was found that manipulating participants to think about mental disorders in one essentialist way (for example, as being difficult to cure) also led them to make essentialist inferences about mental disorders on other related aspects (or example, as being biologically determined, or having necessary features). This result suggested a coherent structure of essentialist thinking underlying lay beliefs about mental disorders. In another study, Ahn and colleagues (2006) compared essentialist thinking among undergraduate students and practicing clinicians, and found that clinicians were less likely to endorse a causal essence for mental disorders than novices, even though both of them endorsed causal essence for medical disorders. Despite the decreased tendency to essentialize mental disorders, one third of clinicians still had a categorical view of most mental disorders (Ahn et al., 2006). Put together, these findings demonstrated that both lay people and, to a lesser degree, some experts hold essentialist beliefs about mental disorders.

However, past studies have not looked into whether and how essentialist thinking about mental disorders is influenced by cultural inputs. There are reasons to expect that culture shapes essentialist beliefs. Researchers have argued that culture might bring an impact on essentialist thinking via different structures of social arrangements (e.g., segregated vs. integrated environments, Deeb et al., 2011), category salience (e.g., Diesendruck et al., 2013; Smyth et al., 2017), exposure to diversity (Pauker et al., 2016; Pauker et al., 2017), use of generic language (Rhodes, Leslie & Tworek, 2012), as well as culturally specific beliefs (e.g., about genetic determinism, Dar-Nimrod & Heine, 2012). Building upon these theoretical and empirical accounts, the current paper aims to investigate cultural differences in essentialist
beliefs about disorder concepts. We will compare two culturally distinct samples: U.S and China, as typical examples of the western individualistic and eastern collectivistic cultures, respectively (Triandis, 1988; Markus & Kitayama, 2010). We argue that cultural impacts on essentialist beliefs about mental disorders would manifest in two possible ways: 1) through specific cultural beliefs about the nature of mental disorders (e.g., traditional Chinese medicine vs. western medicine theories); and 2) through the general structure of concept representation (e.g., the collectivistic/ holistic vs. individualistic/ analytic cognitive style, Nisbett et al., 2001; Nisbett & Miyamoto, 2005).

Following these two lines of hypotheses, we generated two specific predictions about cross-cultural differences in essentialist thinking about mental disorders. First, essentialist beliefs might be influenced by specific cultural theories regarding the nature of mental disorders. Compared to the Western medicine theories, Traditional Chinese Medicine (TCM) emphasizes mental and emotional disorders (e.g., mania kuang, withdrawal dian, epilepsy xian etc., Garvey & Qu, 2008) as being caused by the disturbance of balance between the five spirits (wushen), each of which was associated with a body organ (e.g., Hun associated with liver, Po associated with lung, Zhi associated with kidney, Yi associated with spleen, and Shen associated with heart; Aung et al., 2013). In this sense, Traditional Chinese Medicine essentializes mental disorders by categorizing mental disorder symptoms and mapping each of them to the dysfunction of a specific body organ. Consistent with this view, previous studies demonstrated that Chinese participants tended to somatize mental disorders to be physical, instead of psychological (Kleinman, 2004). Therefore, we predicted that Chinese participants would be more likely than American participants to essentialize mental disorders as natural kinds being caused by uniform pathological mechanisms (prediction 1a).

Second, essentialist beliefs may be influenced by the collectivistic/ holistic culture on a broader level. Specifically, traditional Confucian value put much emphasis on collective agency and group uniformity (Nisbett et al., 2001); this group level orientation inevitably leads to the consequence of ignoring individual uniqueness. In line with this view, previous evidence has shown that East Asian participants were more likely to perceive objects from a holistic perspective, even in low level visual processing (Nisbett & Miyamoto, 2005). Our studies on essentialist thinking in the social domain lent additional support to this cultural hypothesis: Chinese adults consistently perceived a range of social categories as more cohesive than American adults (Coley et al., under review). The current paper will test whether this cultural pattern extends to the domain of mental disorders. We expected Chinese participants to essentialize mental disorders on the cohesiveness dimension to a greater degree than U.S participants (prediction 1b).

In addition to investigating cultural differences in essentialist beliefs about mental disorders, the current paper also aims to examine the clinical consequences of essentialist thinking, in predicting
perceived psychological normality, diagnosis judgments and need for treatment decisions. Previous research has discussed the downstream consequences of psychological essentialism in science education (Shtulman & Schulz, 2008), creativity and problem-solving skills (Tadmor et al., 2012), social prejudice and intergroup relations (Rhodes et al., 2015; Mandalaywala, Amodio, & Rhodes, 2018), and support for boundary-enhancing policies (Roberts et al., 2017). Besides, our study on essentialist beliefs about crime concepts demonstrated that essentialist thinking systematically predicted culpability and punishment decisions in lay participants (Study 1). However, there is little empirical research that shed light on the implications of essentialist beliefs in the clinical domain. The current study will extend this line of research and explore how essentialist beliefs about mental disorders influences important clinical judgments.

Essentializing mental disorders is manifested in the belief that mental disorder is defined by a fixed, naturally assigned underlying reality (often imagined as biological signature), which leads to uniform disorder features or symptoms. It is likely that those who see mental disorders as “real” disease would be more likely to perceive individuals with mental disorder symptoms as psychologically abnormal; whereas those who see mental disorders as socially constructed labels would be more likely to perceive individuals with mental disorders symptoms as psychologically normal. Thus, we predict higher essentialist thinking to be associated with lower perceived psychological normality ratings (prediction 2). Those who essentialize mental disorders as “real” diseases are also more likely to believe in the one-on-one mapping between biochemical causes and disorder symptoms. When seeing individuals with typical mental disorder symptoms, they may be more likely to infer the existence of the underlying necessary cause/essence, thus to make positive diagnosis decisions. Therefore, we predict higher essentialist thinking to be associated with increased likelihood of positive diagnosis decisions (prediction 3). Likewise, we predict that stronger essentialist thinking would also be associated with increased need for treatment judgments (prediction 4), as those who essentialize mental disorders are more likely to attribute the presented symptoms to underlying pathological abnormality.

Method

Participants
491 Chinese undergraduate students from Wuhan, China completed the study online for compensation of 20 RMB. Among them, we have screened 68 participants who rushed the survey in less than 10 minutes, which left us with 423 data points (18% male, 82% female; M_{age}=20.4 years). 200 American undergraduate students from a private university in Boston, USA, who are native English speakers, born and brought up in the U.S (30% male, 69% female, M_{age}=18.9 years), completed the study for psychology course credits.
**Materials & Design**

*Clinical Vignettes.* We presented to participants four short vignettes depicting typical symptoms for depression and anxiety, as two main diagnostic categories for mental disorders (WHO, 2017). Each vignette presents either physical or behavioral symptoms of the disorder. These symptoms were written based on the diagnosis criteria of Major Depressive Disorder (MDD) and Generalized Anxiety Disorder (GAD) listed on the Diagnostic and Statistical Manual of Mental Disorders (DSM-V, 2013). Descriptions on these two disorders were comparable to the “Recurrent Depressive Disorder” and the “General Anxiety Disorder” outlined in the Chinese Classification of Mental Disorders (CCMD-3, 2001). Both DSM and CCMD describe mental disorders mainly by listing its symptoms, without providing an explicit causal account that explains what caused such symptoms. The diagnosis criteria in both DSM-V and CCMD-3 included both physical and behavioral symptoms (see Table 1). DSM and CCMD did require behavioral symptoms (depressive mood or excessive worry) to be the central, or necessary diagnosis symptom of MDD and GAD. Other than that, DSM and CCMD listed equal numbers of physical and behavioral symptoms as diagnosis criteria for MDD and GAD, without differentiating the weights between the two symptom types. Description on GAD in CCMD was only brief and minimum, although it included one behavioral and one physical symptom.

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Diagnosis Guidelines</th>
<th>Numbers of Physical Symptoms</th>
<th>Numbers of Behavioral Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDD</td>
<td>DSM</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CCMD</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>GAD</td>
<td>DSM</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CCMD</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

*Table 1.* Diagnosis Symptoms Listed for MDD and GAD in DSM and CCMD.

Disorder and symptoms types were both manipulated within subjects; each participant saw all of the four vignettes in a random order (see Table 2). After reading each vignette, participants were asked to make judgments on how psychologically normal the individual is on a 9-point scale and whether or not this person has depression or anxiety disorder. Additionally, participants were also asked to rate how much the person needs treatment, how likely the symptoms were caused by genetic, personality, or life situational reasons, as well as how effectively the symptoms could be cured by medicine, therapy, physical exercise, balanced life style and social network support, each on a 9-point scale.
Daisy is 20 years old. In the past six months, she has been losing weight, and has pain in her back and joints. She has lost her appetite and when she does eat, she ends up with an upset stomach. Most days she's overwhelmed with fatigue.

Mary is 20 years old. In the past six months, she has been feeling really down. She wakes up in the morning with a flat heavy feeling that sticks with her all day long. She is not enjoying things the way she normally would. In fact, nothing gives her pleasure.

Jane is 20 years old. In the past six months, she has experienced chest tightness and shortness of breath from time to time. She feels pain that moves all over her body. She has trouble falling asleep at night, and gets tired easily during the day.

Linda is 20 years old. In the past six months, she constantly worries about everything she has to do. During the day, she just can’t seem to stay still. She feels on edge all the time. She finds it difficult to concentrate on her work.

### Table 2. Clinical Vignettes for Depression and Anxiety Symptoms.

**Essentialism Scale.** We used an essentialism scale adapted from Haslam & Ernst (2002) to measure participants’ essentialist beliefs about mental and medical disorders. The scale included nine items, each tap into one proposed component of essentialist beliefs, including: naturalness, necessity, immutability, stability, discreteness, inherence, uniformity, exclusivity and informativeness (see Table 3 for a full list of scale items). Participants were asked to rate the extent to which they agree with each of the statements with regard to a range of disorders on a 9-point scale. These included four familiar mental disorders (depression, anxiety, schizophrenia, PTSD), four familiar medical disorders (pneumonia, chickenpox, asthma, arthritis, from Ahn et al. 2006), and two seemingly ambiguous disorders (Alzheimer’s and autism). Statements were presented in nine blocks of items with randomized order. Within each block, participants rated the ten disorders in random order on a single essentialism item.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Item</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naturalness</td>
<td>Naturalness</td>
<td>Some disorders exist in the natural world, they were discovered, instead of being 'invented' by a culture or decided upon by experts.</td>
</tr>
</tbody>
</table>
### Table 3. Essentialism Scale for Mental and Medical Disorders.

<table>
<thead>
<tr>
<th>Necessity</th>
<th>Some disorders have necessary causes or features, without which people would not have that disorder.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immutability</td>
<td>Some disorders cannot be readily and completely cured once you have it.</td>
</tr>
<tr>
<td>Stability</td>
<td>Some disorders are more stable than others; they have existed throughout human history and across cultures, with few changes.</td>
</tr>
<tr>
<td>Discreteness</td>
<td>Some disorders have clear and sharp boundaries, so that people either have the disorder or not.</td>
</tr>
<tr>
<td>Uniformity</td>
<td>For some disorders, people who have that same disorder share a lot of similarities (symptoms, causes and/ or other features).</td>
</tr>
<tr>
<td>Inherence</td>
<td>For some disorders, it seems that there is something deep in common that is shared by all those who have that disorder, whether or not it is identified by current scientific methods.</td>
</tr>
<tr>
<td>Exclusivity</td>
<td>Some disorders are exclusive. People who are diagnosed with that disorder cannot be diagnosed with another disorder.</td>
</tr>
<tr>
<td>Informativeness</td>
<td>Some disorders are very informative; knowing that someone has that disorder tells us a lot about the person.</td>
</tr>
</tbody>
</table>

**Demographics.** We collected participants’ demographic information, including age, major, gender, ethnicity, religion, political stance and annual household incomes. Additionally, we asked participants to list any college-level course they have taken relevant to clinical or abnormal psychology. Besides, we asked participants to report their familiarity about DSM, or CCMD, as well as their personal exposure to the ten disorders displayed in the essentialism scale.

**Translations.** The study materials were translated into Chinese by a bilingual native Chinese speaker who is fluent in English and had formal training in translation. The translated Chinese version was independently checked by another bilingual native Chinese speaker to make sure there is no major discrepancies of understanding.

**Procedure**
The study was programmed on Qualtrics software (Qualtrics, Provo, UT) and distributed to Chinese participants online. Chinese participants completed the study at a time and location of their convenience.
American participants signed up for the study on psychological research pool and completed the study in a lab room. Participants were informed that there is no right or wrong answer to the questions in the survey, researchers were only interested in people’s own thoughts. After finishing the study, participants were debriefed and told that the vignette materials were all fictional and should not be taken as real cases. On average, participants completed the study in 20-30 minutes.

**Results**

**Essentialist Ratings on Mental and Medical Disorders.** First, we tested our predictions 1a and 1b about cultural difference patterns of essentialist thinking about mental and medical disorders. We generated two essentialist indexes (naturalness and cohesiveness) per disorder and per participant, by averaging essentialist ratings on the corresponding essentialism items (naturalness, necessity, immutability, stability and discreteness for the naturalness dimension; uniformity, inherence, exclusivity and informativeness for the cohesiveness dimension). We then averaged the naturalness and cohesiveness scores across mental disorder categories (depression, anxiety, PTSD and schizophrenia) and medical disorder categories (pneumonia, chickenpox, asthma and arthritis) per participant. A 2 (disorder type: mental vs. medical) x 2 (essentialist dimension: naturalness vs. cohesiveness) x 2 (culture: U.S vs. China) Mixed ANOVA model showed a significant three-way interaction between disorder type, essentialism dimension and culture, \( F_{1,617}=22.0, p<.001, \eta^2=.034 \). There was no main effect of culture on essentialist ratings. However, culture interacted with both disorder type (\( F_{1,617}=57.8, p<.001, \eta^2=.086 \), and essentialism dimension (\( F_{1,617}=268.9, p<.001, \eta^2=.303 \). For mental disorders, American and Chinese participants did not differ in their essentialist ratings on the naturalness dimension. However, Chinese participants were significantly above the American participants on their cohesiveness ratings (\( t_{617}=11.2, p<.001, d=.95 \)) of mental disorders, see Figure 1. For medical disorders, American participants gave significantly higher ratings on naturalness (\( t_{617}=15.1, p<.001, d=1.34 \)), and significantly lower ratings on cohesiveness (\( t_{617}=4.4, p<.001, d=.39 \)) than Chinese participants, see Figure 2. Our cultural prediction 1(a) that Chinese participants would show higher naturalness ratings than American participants was only found with medical disorders, but not mental disorders. Our cultural prediction 1(b) that Chinese participants would show higher cohesiveness ratings was supported by results on both medical and mental disorders.
Results also revealed a main effect of disorder type ($F_{1,617}=258.4, p<.001, \eta^2=.295$) and a main effect of essentialism dimension ($F_{1,617}=359.7, p<.001, \eta^2=.368$), as well as a significant two-way interaction between disorder type and essentialism dimension ($F_{1,617}=752.8, p<.001, \eta^2=.550$). Across cultural groups, medical disorders were essentialized to a greater degree than mental disorders. Overall, medical disorders were more essentialized on the naturalness dimension than mental disorders, whereas mental disorders were more essentialized on the cohesiveness dimension than medical disorders, see Figure 3.
Perceived Psychological Normality. Next, we examined the rest of our predictions regarding the clinical judgments from the vignette reading. We started from looking at how perceived psychological normality varies across the vignettes. After reading each vignette describing an individual with typical physical or behavioral symptoms of depression or anxiety disorders, participants judged how psychologically normal this person was on a 9-point scale. A 2 (disorder type: depression vs. anxiety) x 2 (symptom type: physical vs. behavioral) x 2 (culture: U.S vs. China) Mixed ANOVA model revealed no main effect of culture on perceived psychological normality ratings. There was a main effect of disorder type ($F_{1,617}=167.3$, $p<.001$, $\eta^2=.213$), a main effect of symptom type ($F_{1,617}=99.4$, $p<.001$, $\eta^2=.139$), as well as a two-way interaction between the two ($F_{1,617}=52.7$, $p<.001$, $\eta^2=.079$). Individuals presented with physical symptoms were perceived as more psychologically normal than those presented with behavioral symptoms; this pattern holds up for both disorder types, although the effect size for depression vignettes ($t_{618}=13.898$, $p<.001$, $d=.67$) was bigger than that for anxiety vignettes ($t_{618}=2.230$, $p=.026$, $d=.11$), see Figure 4. Besides, individuals presented with typical anxiety symptoms were perceived as more psychologically normal than those with typical depression symptoms ($t_{618}=13.4$, $p<.001$, $d=.56$). This was mainly driven by differences in the behavioral condition.
We further examined the relationship between perceived psychological normality and essentialist beliefs about depression and anxiety disorders. We predicted that higher essentialist ratings on the corresponding disorder would be associated with lower psychological normality ratings (prediction 2). To do so, we conducted multiple regression analyses using naturalness and cohesiveness ratings as continuous predictors, culture (U.S vs. China) and symptom type (physical vs. behavioral) as categorical predictors, and perceived normality scores as the outcome variable. Separate models were run for Depression and Anxiety cases. Essentialist ratings on cohesiveness dimension in particular were found as a significant predictor of perceived normality, for both depression ($\beta=-.065$, $p=.042$, $R^2=0.102$) and anxiety cases ($\beta=-.086$, $p=.009$, $R^2=0.014$), see Table 4-5. The more homogenous participants perceived the disorder, the more psychologically abnormal they view individuals with typical symptoms. As discussed above, symptom type also predicted perceived normality: individuals presented with behavioral symptoms were perceived as less psychological normal than those with physical symptoms. These findings provide support to our prediction 2 that higher essentialist ratings would be associated with lower perceived psychological normality.

Table 4. Essentialist Ratings Negatively Predicted Perceived Psychological Normality Judgment on Depression Symptoms.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>SE</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naturalness</td>
<td>.020</td>
<td>.046</td>
<td>.012</td>
<td>.440</td>
<td>.660</td>
</tr>
</tbody>
</table>

Figure 4. Perceived Psychological Normality in Patients with Typical Depression and Anxiety Symptoms.
Cohesiveness     -.094  .046  -.065  -2.040  .042*
Symptom          -1.194 .102  -.315  -1.271 <.001***

**Depression Model:** $R^2 = .102, p < .001***$

**Table 5.** Essentialist Ratings Negatively Predicted Perceived Psychological Normality Judgment on Anxiety Symptoms.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naturalness</td>
<td>-.076</td>
<td>.051</td>
<td>-.045</td>
<td>-1.502</td>
<td>.133</td>
</tr>
<tr>
<td>Cohesiveness</td>
<td>-.131</td>
<td>.050</td>
<td>-.086</td>
<td>-2.633</td>
<td>.009**</td>
</tr>
<tr>
<td>Culture</td>
<td>.048</td>
<td>.131</td>
<td>.012</td>
<td>.371</td>
<td>.710</td>
</tr>
<tr>
<td>Symptom</td>
<td>-.216</td>
<td>.108</td>
<td>-.057</td>
<td>-2.008</td>
<td>.045*</td>
</tr>
</tbody>
</table>

**Anxiety Model:** $R^2 = .014, p = .002**

**Diagnosis Decisions.** We next examined participants’ diagnosis decisions from the four vignettes. After reading each vignette describing an individual with typical depression or anxiety symptoms, participants made simple diagnosis decisions on whether or not the individual had the corresponding disorder. Three response options were presented to the participants: Yes, No, and “Kind of.” We conducted Two-way Chi-square analyses to look at whether the distribution of diagnosis responses differ across the two cultural samples. Separate analyses were run for each of the four vignettes. Results showed that the distribution of diagnosis decisions differ between the Chinese and U.S sample in all of the four conditions. For Depression-Physical symptoms, American participants made more full positive diagnosis (18.9%) than Chinese participants (8.5%), whereas Chinese participants made more partial positive diagnosis decisions (65.0%) than American participants (51.0%), $\chi^2_{2, 619} = 17.171, p < .001$ (see Figure 5).

For Depression-Behavioral symptoms, American participants again made more full positive diagnosis (76.0%) than Chinese participants (47.5%), whereas Chinese participants made more partial diagnosis decisions (45.4%) than American participants (21.9%), $\chi^2_{2, 619} = 44.869, p < .001$ (see Figure 6).

Interestingly, for Anxiety-Physical symptoms, Chinese participants made more full positive diagnosis
decisions (35.5%) than American participants (25.0%), and American participants made more partial diagnosis (51.5%) and more null diagnosis decisions (23.5%) than Chinese participants (45.9%, 18.7%), $\chi^2_{2, 619}=6.986, p=.030$ (see Figure 7). For Anxiety-Behavioral symptoms, American participants again made more full positive diagnosis decisions (55.1%) than Chinese participants (43.3%), whereas Chinese participants made more partial diagnosis (46.3%) and more null diagnosis decisions (10.4%) than American participants (35.7%, 9.2%), $\chi^2_{2, 619}=7.708, p=.021$ (see Figure 8). Overall, American participants made more positive (“Yes”) diagnosis in three out of four vignettes, except for the Anxiety-Physical condition. Additional analyses revealed that across samples, participants made more full positive diagnosis decisions on behavioral symptoms than physical symptoms, this pattern was true for both depression (56.5% vs. 11.8%, $\chi^2_{1, 619}=275.538, p<.001$), and anxiety cases (47.0% vs. 32.1%, $\chi^2_{1, 619}=28.589, p<.001$). Despite of the previous finding suggesting that Chinese participants tend to somaticize mental disorder as physical symptoms (Kleinman, 2004), Chinese participants, like American participants, made more positive diagnosis on behavioral symptoms rather than physical symptoms. This pattern was consistent with both DSM and CCMD that requires behavioral symptom (depressive mood or excessive worry) as the necessary symptom for MDD and GAD.

![Figure 5. Distribution of Diagnosis Decisions on Depression-Physical Symptoms.](image)
Figure 6. Distribution of Diagnosis Decisions on Depression-Behavioral Symptoms.

Figure 7. Distribution of Diagnosis Decisions on Anxiety-Physical Symptoms.

Figure 8. Distribution of Diagnosis Decisions on Anxiety-Behavioral Symptoms.
We further explored the relationship between diagnosis decisions and essentialist beliefs. We predicted that stronger essentialist thinking would be associated with higher likelihood of positive diagnosis decisions (prediction 3). We recoded participants’ “Yes” responses as “1”, and other responses as “0”. In this way, we were most interested in how essentialist ratings would predict the likelihood participants made full positive diagnosis decisions. We conducted a series of binary logistic regression analyses for each vignette condition, using the naturalness and cohesiveness indexes of essentialist beliefs as continuous predictors, culture (U.S vs. China) and symptom type (physical vs. behavioral) as categorical predictors, and the binary positive diagnosis decision as the dependent variable. Separate models were run for Depression and Anxiety cases. Results showed that in the Depression Model, positive diagnosis was predicted by culture ($e^\beta=.287$, $p<.001$, $R^2=.345$) and symptom type ($e^\beta=11.257$, $p<.001$, $R^2=.345$), but not essentialist ratings, see Table 6. As discussed above, Chinese participants were less likely to make positive diagnosis decisions than American participants. Overall, participants were more likely to generate positive diagnosis for behavioral symptoms than physical symptoms. After controlling for culture and symptom type, essentialist ratings on cohesiveness significantly predicted positive diagnosis decisions on anxiety symptoms ($e^\beta=1.139$, $p=.018$, $R^2=.039$), see Table 7. The more homogenous participant consider Anxiety disorder is, the more likely they made a positive diagnosis when seeing individuals with typical Anxiety symptoms. This finding provides partial support to our prediction 3, that higher essentialist thinking would be associated with higher likelihood of making positive diagnosis decisions. We found this predicted pattern in anxiety cases, but not depression cases.

Table 6. Essentialist Ratings Did Not Predict Positive Diagnosis on Depression Symptoms.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>Exp(B)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naturalness</td>
<td>.043</td>
<td>.062</td>
<td>.465</td>
<td>1.044</td>
<td>.495</td>
</tr>
<tr>
<td>Cohesiveness</td>
<td>.091</td>
<td>.063</td>
<td>2.073</td>
<td>1.095</td>
<td>.150</td>
</tr>
<tr>
<td>Culture</td>
<td>-1.249</td>
<td>.174</td>
<td>51.591</td>
<td>.287</td>
<td>&lt;.001***</td>
</tr>
<tr>
<td>Symptom</td>
<td>2.421</td>
<td>.157</td>
<td>237.232</td>
<td>11.257</td>
<td>&lt;.001***</td>
</tr>
</tbody>
</table>

**Depression Model:** $R^2=.345$, $p<.001$***

Table 7. Essentialist Ratings Predicted Positive Diagnosis on Anxiety Symptoms.
<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>Exp(B)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naturalness</td>
<td>.018</td>
<td>.055</td>
<td>.108</td>
<td>1.018</td>
<td>.743</td>
</tr>
<tr>
<td>Cohesiveness</td>
<td>.130</td>
<td>.055</td>
<td>5.622</td>
<td>1.139</td>
<td>.018*</td>
</tr>
<tr>
<td>Culture</td>
<td>-.171</td>
<td>.143</td>
<td>1.429</td>
<td>.843</td>
<td>.232</td>
</tr>
<tr>
<td>Symptom</td>
<td>.631</td>
<td>.118</td>
<td>28.475</td>
<td>1.879</td>
<td>&lt;.001***</td>
</tr>
</tbody>
</table>

Anxiety Model: $R^2=.039, p<.001***$

**Treatment Judgment.** We examined participants’ need for treatment decisions across vignettes. After reading each vignette that describes an individual with typical depression or anxiety symptoms, participants rated the extent to which this individual need professional treatment on a 9-point scale (1=No Need for Treatment; 9=Absolutely Need Treatment). A 2 (disorder type: depression vs. anxiety) x 2 (symptom type: physical vs. behavioral) x 2 (culture: U.S vs. China) Mixed ANOVA model showed a main effect of culture ($F_{1,616}=19.763, p<.001$, $\eta^2=.031$), as well as a two-way interaction between culture and disorder type ($F_{1,616}=26.0, p<.001$, $\eta^2=.025$). Overall, American participants gave higher need for treatment judgments ($M=7.16, SD=1.00$) than Chinese participants ($M=6.72, SD=1.18$), $t_{617}=4.499$, $p<.001$, $d=.40$. This pattern was more robust with depression symptoms ($t_{617}=6.045, p<.001$, $d=.55$) than anxiety symptoms ($t_{617}=1.999, p=.046$, $d=.17$), see Figure 9. In addition to the cultural differences, results also showed a main effect of disorder type ($F_{1,616}=182.5, p<.001$, $\eta^2=.229$), a main effect of symptom type ($F_{1,616}=39.7, p<.001$, $\eta^2=.061$), as well as a significant interaction between the two ($F_{1,616}=190.6, p<.001$, $\eta^2=.169$). Overall, depression symptoms were judged as having higher need for treatment than anxiety symptoms. For anxiety cases, physical symptoms elicited higher need for treatment ratings, whereas this pattern was reversed for depression cases, see Figure 10. No three-way interaction was found in the model.
We further analyzed whether need for treatment judgment was predicted by essentialist beliefs. We predicted that higher essentialist ratings would be associated with higher need for treatment ratings (prediction 4). To test this, we conducted multiple regression analyses for each vignette, using naturalness and cohesiveness ratings as continuous predictors, culture and symptom type as categorical predictors, and need for treatment scores as the dependent variable. Separate models were run for depression and anxiety cases. In the Depression Model, culture was found the only significant predictor of need for treatment ratings ($\beta=-6.282, p<.001, R^2=.042$), see Table 8. No relationship was found between essentialist ratings and need for treatment judgment on depression symptoms. In the Anxiety Model, need for treatment ratings were significantly predicted by both naturalness ratings ($\beta=.124, p<.001, R^2=.106$).
and symptom type ($\beta=-.293, p<.001, R^2=.106$), see Table 9. The more participants view Anxiety disorder as a real, naturally formed category, the more they perceive individuals with typical anxiety symptoms as in need for medical treatment. This finding provides partial support to our prediction 4 that higher essentialist thinking would be associated with higher need for treatment judgment. We found this predicted pattern again with anxiety cases but not depression cases.

**Table 8. Essentialist Ratings Did Not Predict Need for Treatment Decision on Depression Symptoms.**

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>SE</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naturalness</td>
<td>.050</td>
<td>.039</td>
<td>.038</td>
<td>1.289</td>
<td>.198</td>
</tr>
<tr>
<td>Cohesiveness</td>
<td>.012</td>
<td>.039</td>
<td>.010</td>
<td>.300</td>
<td>.764</td>
</tr>
<tr>
<td>Culture</td>
<td>-.670</td>
<td>.107</td>
<td>-.199</td>
<td>-6.282</td>
<td>&lt;.001***</td>
</tr>
<tr>
<td>Symptom</td>
<td>.159</td>
<td>.087</td>
<td>.051</td>
<td>1.822</td>
<td>.069†</td>
</tr>
</tbody>
</table>

**Depression Model:** $R^2=.042, p<.001***$

**Table 9. Essentialist Ratings Predicted Need for Treatment Decision on Anxiety Symptoms.**

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
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<th>$\beta$</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naturalness</td>
<td>.192</td>
<td>.044</td>
<td>.124</td>
<td>4.336</td>
<td>&lt;.001***</td>
</tr>
<tr>
<td>Cohesiveness</td>
<td>.030</td>
<td>.043</td>
<td>.022</td>
<td>.702</td>
<td>.483</td>
</tr>
<tr>
<td>Culture</td>
<td>-.213</td>
<td>.114</td>
<td>-.057</td>
<td>-1.877</td>
<td>.061</td>
</tr>
<tr>
<td>Symptom</td>
<td>-1.021</td>
<td>.094</td>
<td>-.293</td>
<td>-10.871</td>
<td>&lt;.001***</td>
</tr>
</tbody>
</table>

**Anxiety Model:** $R^2=.106, p<.001***$

**Familiarity with DSM/CCMD.** We compared American and Chinese participants’ familiarity with clinical guidelines for mental disorder classifications to see whether these two cultural samples differed in their self-reported expertise. Even though participants from both the U.S and Chinese sample had taken minimum numbers of clinical or abnormal psychology courses at university ($M_{u.s}=.36, M_{china}=.59$), Chinese participants self-reported higher familiarity with clinical guidelines for mental disorders ($M=3.73, SD=1.61$) than American participants ($M=3.17, SD=2.24$), $t_{617}=3.532, p<.001, d=.29$. We then conducted multiple regression analyses to look at the relationship between familiarity with clinical
guidelines and mean essentialist ratings for mental disorders. Results indicated that familiarity with clinical guidelines significantly predicted naturalness ratings on mental disorders in the Chinese sample ($\beta=.162$, $p<.001$, $R^2=.026$) but not in the U.S sample. Familiarity with DSM/CCMD did not predict cohesiveness ratings in either sample. Note that CCMD mainly defines mental disorders by describing and listing diagnosis symptoms, without providing causal mechanisms that explain why such symptoms occur in patients. Besides, both DSM and CCMD listed comparable numbers of physical and behavioral symptoms for the main disorders that we focus in the current study, therefore did not show explicit bias towards either a physiological or psychological account on the underlying causes of mental disorders. The current findings, although drawn from a different population with different range of expertise, provided interesting evidence that contrasted with previous findings suggesting that mental health expertise decreases essentialist thinking about mental disorders (Ahn et al., 2006).

![Figure 11. Familiarity with CCMD Predicted Naturalness Ratings on Mental Disorders in Chinese Participants.](image)

**Discussion**

The current research investigated cultural differences in essentialist beliefs about mental and medical disorders, as well as its relation to subsequent clinical decision-making. Results from the current research shed light on the universal yet malleable nature of psychological essentialism. Overall, essentialist thinking was comparable between our U.S and Chinese sample. No main effect of culture was detected;
adults from the Eastern Asian society were no less likely to essentialize mental and medical disorders than American participants, suggesting that psychological essentialism is not a unique product of the Western industrialized culture. The fact that psychological essentialism exists in both societies, however, does not assume that cultural environments have no influence on the nuanced ways in which essentialist thinking exhibits with regard to specific types of disorders as well as specific dimensions of essentialism. Across all disorders, U.S participants gave higher essentialist ratings on the naturalness dimension than Chinese participants, whereas Chinese participants gave higher essentialist ratings on the cohesiveness dimensions than U.S participants. This overall pattern is consistent with evidence from cross-cultural comparisons on essentialist thinking with social categories (Coley et al., under review). The same cross-cultural pattern consistently emerged from different domains suggested that psychological essentialism is likely to be a domain general, instead of a domain-specific cognitive construct scaffolding lay beliefs about concepts.

The finding that the two cultural samples did not differ in essentialist thinking about mental disorders in particular on the naturalness dimension goes against our prediction that Chinese participants would be more likely to essentialize mental disorders as natural kinds. However, if we consider the overall cultural pattern that American participants tend to essentialize concepts on the naturalness dimension more than Chinese participants (as was shown with reasoning about social categories as well as about medical disorders in the current study), the current finding may in fact suggest the possibility that Chinese culture, especially the exposure to traditional Chinese medicine theories, does indeed increase essentialist beliefs about mental disorders from the baseline level to a comparable level with American participants, although such an effect may not be strong enough to reach a reversed cultural pattern. In other words, the common discourse about mental disorders in traditional Chinese medicine theories, as we hypothesized, may have made the domain of mental disorders a special case for Chinese participants, where we did not observe stronger essentialist thinking in American participants. Qualitative research is needed to gather further evidence on this speculative hypothesis, and to elucidate how specific content of common cultural discourse shapes essentialist understanding about mental disorders.

Results from the current study provided evidence on how presenting different types of symptoms influences clinical judgments with depression and anxiety disorders. It was shown that patients presented with typical anxiety symptoms were perceived as more psychologically normal than patients with typical depression symptoms, suggesting a stronger stigma with depression in both cultures. Besides, patients presented with physical symptoms were perceived as more psychologically normal than those presented with behavioral symptoms; this pattern was more robust in anxiety cases. Presenting physical symptoms of mental disorders also led to differences in making diagnosis decisions. For both depression and anxiety cases, participants were more likely to make a positive diagnosis decision when presented with behavioral symptoms than presented with physical symptoms. These findings suggested that behavioral symptoms
are perceived as more diagnostic symptoms of mental disorders, which is consistent with both DSM and CCMD guidelines that require behavioral symptoms (depressive mood or excessive worry) to be the central symptom of MDD and GAD. This general pattern of associating mental disorders to behavioral or mental symptoms more than physical symptoms might be rooted in the traditional dualism account that separates mind and body as two distinct systems.

The current study also explored the relationship between essentialist beliefs and clinical judgments about mental disorders. Consistent with our hypotheses, we found evidence that essentialist beliefs were negatively associated with perceived psychological normality, and positively associated with diagnosis decisions, as well as need for treatment decisions. Even though these findings were not entirely consistent across the disorders, they provided initial empirical evidence that essentialist beliefs about mental disorders may lead to important downstream consequences in both diagnosis and treatment seeking behaviors. Indeed, essentializing mental disorders may influence clinical decisions in both directions, perhaps depending on what was perceived as the underlying essence and necessary features of the disorder. Those who strongly essentialize mental disorders as caused by deep underlying realities may or may not see the specific symptoms presented in our vignettes as necessary features of the disorder, thus may or may not view the patient as a typical member of the disorder. As shown by previous studies, clearly marked causal status of mental disorder symptoms guided participants’ classification judgments (Kim & Ahn, 2002). The current study measured essentialist beliefs about mental disorders at an abstract level, without looking into the specific content of the naïve theories that participants may hold regarding depression and anxiety disorders. Future research should address this issue and provide qualitative descriptions of lay beliefs about mental disorders, and investigate how it influences diagnosis decisions.

We found an interesting positive relationship between essentialist beliefs and familiarity with clinical guidelines on the classification of mental disorders. Previous studies revealed mixed findings on the effect of expertise on essentialist thinking as an intuitive cognitive construct. Some suggested that expertise decreases essentialist thinking about mental disorders (Ahn et al., 2006) and crime concepts (Study 1). Other evidence, however, showed that essentialist thinking persists with formal scientific training (Coley et al., 2017). It is important to note that our sample was composed of lay people in general. Even though some participants in the sample were students enrolled in psychology programs and had some level of exposure to clinical psychology, they were in no way comparable to the licensed practicing clinicians in Ahn and colleagues (2006). From this perspective, the current findings supplement previous evidence and added to the literature on how initial exposure to mental disorder knowledge may increase, instead of decreasing the tendency of essentializing mental disorders as natural kinds. It may be the case that after the initial increase, further expertise in the domain would decrease essentialist beliefs in later stage. It is interesting that this pattern was only observed in the Chinese sample but not the U.S
sample. On the one hand, the limited range of expertise in our participants as well as the relatively smaller size of the U.S sample might constrain the capture of any significant relationship. On the other hand, U.S participants in general have higher naturalness ratings than Chinese participants, which might constrain the otherwise possible early expertise effect on increasing their naturalness ratings on mental disorders.

The current study bears a number of limitations. First, it covers only two mental disorders in examining the relationship between essentialist beliefs and clinical decisions. Although depression and anxiety are among the most prevalent mental disorders, the current evidence is still limited in scope, thus could not provide a complete picture of how lay people conceptualize mental disorders. Besides, we used an explicit essentialism scale to measure essentialist beliefs about mental disorders at an abstract level, without qualitatively documenting the content of lay participants’ naïve theories about mental disorders. Future research should apply qualitative methods to more closely examine the nature of essentialist understanding about mental disorders and its relations to subsequent clinical decisions. Even though we have touched upon how initial exposure to clinical guidelines influences essentialist beliefs about mental disorders, the current sample is still very much limited in its variability on clinical expertise. This constrained us to present a full story of how increasing level of expertise shapes essentialist beliefs in different stages. Last, the vignettes we used in the current study were all presented from a third-person perspective, therefore the responses might be different from the scenarios when participants experience the symptoms (as patients) themselves, or from the diagnosis decisions made by clinicians in real practices. Future research could address this issue by combining experimental findings with results from field studies based on direct interactions with patients and clinicians, to ensure the external validity.

**Conclusion**

The current study investigated lay people’s essentialist beliefs about mental and medical disorders in U.S and China, and how it is related to subsequent clinical decisions. We found that mental disorders were less essentialized as natural kinds as compared to medical disorders, yet more likely to be essentialized as homogenous, coherent disorder. Besides, American participants essentialized mental disorders more on the naturalness dimensions than Chinese participants, whereas Chinese participants essentialized mental disorders more on the cohesiveness dimension. Importantly, we found evidence that essentialist beliefs predicted perceived psychological normality, diagnosis decision, as well as need for treatment judgments. The current findings shed light on the universal and malleable nature of psychological essentialism, suggesting that psychological essentialism is a domain-general cognitive construct systematically shaped by cultural and experiential inputs.
Paper 3

Not Guaranteed: How Multicultural Experience Shapes Essentialist Beliefs about National Groups in American and Chinese College Students

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Abstract

Nationality constitutes an important part of social categorization and contains powerful personal and social meanings. However, little empirical research has examined how people form nationality concepts and the extent to which it is shaped by cultural input as well as personal experience. The current study aims to investigate how experience of studying abroad may influence essentialist beliefs about national groups, or the degree to which people view national groups as having underlying fixed essence, and uniform group members. We compared American and Chinese college students studying domestically and internationally (N= 290), and measured their essentialist beliefs about nationality by using the switched-at-birth task and social essentialism scale. We found a main cultural difference that overall American participants were more likely to essentialize national groups as real, naturally formed categories; whereas Chinese participants were more likely to essentialize national groups as homogenous groups. Additionally, our results showed that the effect of multicultural experience on essentialist beliefs unfolds differently in the two cultural samples. American international students showed decreased essentialist thinking compared to American domestic students, whereas Chinese international students showed increased essentialist thinking compared to Chinese domestic students. Regression analysis revealed a positive relationship between the length of arrival time and explicit essentialist ratings by Chinese international students on both their ingroup (Chinese) and outgroup (Americans). The current findings shed light on the malleability of essentialist thinking on national groups, addressing the importance of examining the effect of intergroup processes under different social and cultural contexts.

Keywords: Social Essentialism, Multicultural Experience, Nationality, Culture
Introduction

Despite a century of efforts to establish a cooperative global community, the current world is bombarded with regional and national conflicts. For example, the recent escalation of international trade wars as well as the securing of border walls have witnessed the increasing intensification of national boundaries. Setting aside ideological and political struggles, does the rise of nationalism reflect a commonly shared psychological mechanism that people are inclined to endorse? How do people form concepts about national groups and based on what information do people make national identification judgments? Are concepts about nationality fixed, or open to revision? Are they culturally universal, or are they contingent on social inputs?

Previous research suggests that perception of nationality plays a critical role in everyday social life. By distinguishing whether an individual belongs to “us” or “them”, national identification constitutes an important part of social categorization, guiding people to subsequent social decisions. Previous studies have shown that understanding about the content of nationality has important implications in policy orientation. For example, an ethnic account of nationality was associated with higher levels of xenophobia, support of dominant language, and more restrictive attitudes towards immigrants (Hjerm, 1998; Shulman, 2004; Kunovich, 2009).

Indeed, the relationship between national identification and orientation towards outgroups depends on how national groups and national identities are construed by individuals (Reicher & Hopkins, 2001; Pehrson, Brown, & Zagefka, 2009). Despite the central role nationality plays in personal meaning and social life (Hussak & Cimpian, 2019), there is no universally endorsed definition of what constitutes a nation. Some suggested that nation is a stable community of people sharing common territory, language, cultural traditions and economic life (Guiberneau, 1996; Llobera, 1996), while others argue that none of the aforementioned elements constitutes a sufficient or necessary component of nationhood (Reicher & Hopkins, 2001). As such, nationhood seems to be an imagined community (Anderson, 1991), the concept of which is largely shaped by common subjective experience.

Despite the lack of a unifying definition for nationhood, national groups are essentialized and treated as if they entailed immutable, quasi-biological connections among group members (Connor, 1994). Researchers argue that national identity is a particular case of psychological essentialism (Pehrson, Brown, & Zagefka, 2009), which is considered as a basic cognitive framework that structures biological species, social groups as well as other collective concepts as naturally formed on the basis of shared underlying realities (essence or essence placeholders, Medin & Ortony, 1989; Gelman, 2003). An
essentialist account has consequences for the nature and structure of the conceptualization of groups, such as discrete and absolute group boundaries, immutable group membership, uniform group features, and rich inductive potential of group identity (Diesendruck & Gelman, 1999; Shtulman & Schulz, 2008; Gelman & Wellman, 1991; Barrett, 2001). From an essentialist point of view, essentializing nationality entails naive beliefs that: 1) nationality is determined by birth; 2) nationality is fixed, and cannot change; 3) one should either be a member or a non-member of a national group, but not a partial member; 4) members from the same national group share uniform features; 5) even when a child did not exhibit commonly endorsed group features when they were born, eventually they will grow into those; and 6) knowing that someone belongs to a certain national group tells much about this person.

Recent studies have shed light on how national groups are essentialized by U.S participants. Using both forced-choice and open-ended measures, Hussak and Cimpian (2019) have found evidence showing that both U.S children and adults see national group membership as stable and inductively meaningful. When contrasted with salient social categories such as gender and race, participants across age groups relied on nationality membership to make inferences about personal preferences. This finding highlighted the powerful social meaning of national identity in guiding predictions about novel individuals. Results from their study also demonstrated a developmental change pattern. In a task where participants were asked to identify the differences in nationality, younger children were more likely to respond that nationality could be detected by looking at people’s blood, bones and brains. This belief in an underlying biological basis of nationality was found to decrease with age (Hussak & Cimpian, 2019).

The above finding speaks to an important question about whether or not essentialist beliefs are malleable. Previous literature has discussed the origin of psychological essentialism (Haslam, 2017), and the extent to which it is influenced by the use of generic language (Rhodes, Leslie, & Tworek, 2014; Gelman et al., 2014), cultural discourses on the content of essence placeholder (Dar-Nimrod & Heine, 2011; Sousa et al., 2002; Gil-White, 2001), and particular social arrangements such as social diversity (Pauker et al., 2016), or social conflict and segregation (Smyth et al., 2017; Deeb et al., 2011). These studies suggest that psychological essentialism is a cognitively flexible construct that could be shaped by social and developmental experience. However, past research has mainly focused on static cultural or societal influence on essentialist thinking overall. Less research has considered individuals as fluid entities that could possibly move from one social environment to another. In other words, there is little evidence on how fluid, dynamic personal experience shapes essentialist beliefs.

To address this issue, the current paper aims to examine how the personal experience of studying abroad shapes essentialist beliefs about nationality. Previous studies have indicated a number of ways how multicultural experience shapes social and cognitive skills, e.g., in improving creativity and problem-solving performances (Tadmor et al., 2009; Leung & Chiu, 2010; Lee, Therriault, & Linderholm, 2012;
Maddux, Adam, & Galinsky, 2010), increasing self-concept clarity (Adam et al., 2018), as well as reducing intergroup biases (Tadmor et al., 2012). Based on previous evidence, we hypothesized that studying abroad would decrease essentialist beliefs about national groups. First, because it involves immersion in a different culture, study abroad exposes individuals to greater outgroup variability, and provides opportunities for individuals to engage in direct interactions with outgroup members. Such social interactions would allow individuals to observe: 1) within group heterogeneity, and 2) between group similarities, both of which would undermine essentialist perceptions about national groups.

Furthermore, psychological essentialism was shown to be associated with fixed mindsets (Atkins et al., 2018). By definition, essentialist thinking imposes categorical views on group concepts, and entails beliefs that category essence is fixed and impossible to change. It denies within group variability, and consider category members as uniform. Therefore, since multicultural experience was demonstrated to increase cognitive flexibility, we hypothesize that it would also decrease essentialist thinking.

Pauker and colleagues (2018) have examined how exposure to racial diversity led to change in racial essentialism. They tracked a group of American students moving from the continental U.S to Hawaii to attend college, where multiracial population is the highest in the country. They used the Racial Conceptions Scale (Williams & Eberhardt, 2008) to measure the extent to which participants view race as being biologically determined. Results showed that racial essentialism decreased after the first year of college, and that this change was associated with increase in diverse exposure to acquaintances (Pauker et al., 2018). This recent finding provided important evidence that immersive experience in racially diverse society decreases racial essentialism. However, this study only included white participants, and examined diversity immersive experience within the same country. Based on the previous research, the current study aims to: 1) expand the target sample to both white and non-white populations; 2) investigate essentialist beliefs about nationality concepts instead of racial concepts; and 3) theorize the impact of moving internationally instead of domestically on reducing essentialist beliefs. Does exposure to other national groups bring a similar effect of reducing essentialist thinking in reasoning about nationality as it was shown with reasoning about race? To explore this question, we compared a group of U.S and Chinese college students studying either domestically or abroad in U.S and China. We predicted a negative relationship between studying abroad experience and essentialist beliefs about nationality within both the U.S and Chinese sample.

Method

Participants. We recruited four samples of university students from China and the U.S (N=290). This includes: domestic Chinese students studying in Shanghai, China (n=122); overseas Chinese students
studying in Boston, U.S (n=61); domestic American students studying in Boston, U.S (n=74); and overseas American students studying in Shanghai, China (n=33). The domestic American students were recruited from the Psychology participant pool at Northeastern University for course credit. The rest of participants were recruited by word of mouth, and were rewarded 10 RMB for completion of the online survey. The majority of participants recruited from both sites were first- and second-year college students (m_year=1.4 for the U.S sample and m_year=1.7 for the Chinese sample). The current data were collected in Fall, 2017.

Materials. All participants completed an online survey programmed on Qualtrics (Qualtrics, Provo, UT). The survey included two essentialism measures (the switched-at-birth task and social essentialism scale from Haslam and colleagues, 2000). In addition, participants rated their self-identity and the length of time they have spent in the new country.

Switched-at-Birth Task. We adapted the classic switched-at-birth task from previous studies (Gelman & Wellman, 1991; Solomon et al., 1996; Eidson & Coley, 2014) to test the extent to which participants perceive nationality as heritable from birth. We presented participants two vignettes, one describing a child that was born to a Chinese family in China, and adopted by an American family in the U.S; and the other a child that was born to an American family in the U.S, and adopted by a Chinese family in China. Although the term “Chinese” could convey both ethnicity and nationality meanings especially in the U.S context, the term “American” conveys only nationality meanings. By reading the vignettes, participants did not receive information on the ethnicity of the American parents, but only their nationality. In this way, we hope to refrain participants from making ethnicity-based judgments. After viewing each vignette, participants were asked to judge whether the child would exhibit the same personal traits as birth parents or adoptive parents. These personal traits included physical, ability, preference, personality and belief (see Appendix). Higher frequency of choosing birth parents over adoptive parents would suggest that participants believe individual properties were determined by birth, thus indicating higher tendency of essentialist thinking. Participants were also asked to judge whether the child is American or Chinese on two separate scales (0-100). Therefore, judgments of nationality were not mutually exclusive by the design of the task. Instead, participants were granted the discretion to treat the membership to the two nationality groups as either mutually exclusive or overlapping. Higher ratings on nationality consistent with birth parents indicate beliefs in a biological basis of nationality. Again, by contrasting the terms of “American” and “Chinese”, we hope to constrain participants’ reasoning to nationality concepts instead of ethnicity concepts.
Social Essentialism Scale. We used a shortened version of the social essentialism scale (Haslam et al., 2000) that is commonly used for essentialist thinking about social categories. The original scale included 9 items that were clustered on two dimensions: naturalness and cohesiveness. For logistic purpose, we chose three items with the highest factorial loading from each of the two dimensions. Previous work has validated this shortened six-item social essentialism scale with Chinese adult participants (Coley et al., under review), replicating with high fidelity the same two-dimensional construct model from the original study. These six items were: naturalness, necessity, immutability, uniformity, inherence and informativeness (see Appendix). Participants were presented with three focal nationality categories: Chinese, American and French (as a control category). In addition, participants also rated a list of filler social categories such as male, female, police, lesbian/gay, Muslims and black. Participants rated each social category on six essentialism items, each on a 9-point scale. Higher ratings reflect higher tendency of essentializing social categories as being naturally formed and homogenous. Statements were presented in blocks of essentialism items in a random order. Within each item block, the order of social categories was randomized.

Self-identity Rating. We asked participants to rate the extent to which they perceive themselves as being a typical American or Chinese (based on their origin) on a 9-point scale (1=Not at all, 9=Totally). This measure is included to test whether participants’ self-perception predicts their nationality concept.

Open-ended Questions. The survey included an open-ended section where we asked participants to write down five adjectives that best describe a typical American and Chinese person. We also asked participants to describe the way that American and Chinese people were portrayed in the media, with examples and details. Data from the open-ended questions are not discussed in this paper.

Demographics. Participants reported basic demographic information, including gender, school year, ethnicity, major, sexual orientation, religious belief, political affiliation, household annual incomes, and previous international travelling experience. The Chinese international students sample reported the length of arrival time (in number of months) in the U.S. The American international students were recruited from the same cohorts (first and second year) coming to study in China at the same time, therefore did not have enough variability with respect to the length of arrival time.

Translation. The original survey was translated from English to Chinese by a bilingual speaker with professional training in translation. The translated materials were checked by another bilingual speaker to make sure there was no major discrepancy of understanding.
Procedure. American domestic participants recruited from the psychology participant pool in Boston completed the study in a private lab room. The other three samples completed the survey online at a time and place of their own choosing. Participants completed the switched-at-birth task first, followed by the social essentialism scale, self-identity rating, open-ended questions and demographic reports. It took about 20 minutes to finish the study.

Results

Switched-at-Birth Task

Heritability of Personal Traits. In this task, participants were presented two vignettes describing a child that is born to a Chinese family and raised by an American family (Vignette 1), and vice versa (Vignette 2). Participants made judgments on whether the child after growing up would share the same personal traits with birth parents or adoptive parents. We used 2 (Participants Culture) x 2 (International Experience) between-subject ANOVA to test whether culture origin and international experience would have an effect on the number of times participants chose birth parents, or the essentialist tendency to view personal traits as being determined at birth. Models run on the two vignettes revealed an identical pattern: results showed a significant interaction between participants’ culture origin and international experience, both in Vignette 1 ($F_{1, 286}= 5.804, p=.017, \eta^2=.020$) and in Vignette 2 ($F_{1, 286}= 20.215, p<.001, \eta^2=.066$), see Figure 1a & 1b. In both cases, American students studying abroad were less likely to choose birth parents as sharing the same traits with the child, thus showing higher essentialist thinking compared to American students studying domestically. On the contrary, Chinese students studying abroad were more likely to choose birth parents, thus showing weaker essentialist thinking than Chinese students studying domestically.

![Figure 1a & 1b](image)

Figure 1a & 1b. Different Patterns between Domestic and International Students in the U.S and Chinese Sample on Perceived Heritability of Individual Traits (Switched-at-Birth Task Vignette 1 & 2).
Perceiving Nationality as Granted by Birth. After viewing each vignette, participants also judged the nationality of the child on a percentage scale of 0-100% both for being American and being Chinese. We conducted 2 (Participants Culture) x 2 (International Experience) between-subject ANOVA models on perceiving nationality as being tied to birth for each vignette. In Vignette 1, we conducted the ANOVA model on ratings for Chinese nationality (as consistent with the protagonist’s birth parents). Results showed a main effect of culture origin ($F_{1, 286} = 55.693$, $p < .001$, $\eta^2 = .163$), yet no effect of international experience. Overall, U.S participants were more likely to perceive a child born to a Chinese family as having Chinese nationality ($m=57.8\%$, $sd=37.8\%$), than Chinese participants ($m=28.2\%$, $sd=23.2\%$), $t_{288} = 8.37$, $p < .001$, $d = .96$, see Figure 2. In Vignette 2, we conducted the ANOVA model on ratings for American nationality (as consistent with the protagonist’s birth parents). Results showed a significant interaction between culture origin and international experience ($F_{1, 286} = 4.982$, $p = .026$, $\eta^2 = .017$), as well as a main effect of culture origin ($F_{1, 286} = 2.776$, $p < .001$, $\eta^2 = .087$), see Figure 3. As shown in Vignette 1, American participants overall were more likely to perceive American nationality as being granted by birth ($m=52.4\%$, $sd=35.2\%$), than Chinese participants ($m=30.1\%$, $sd=23.4\%$), $t_{288} = 6.467$, $p < .001$, $d = .75$. In particular, American international students were less likely to perceive American nationality as being granted by birth ($m=42.5\%$, $sd=33.9\%$), thus showing lower level of essentialist thinking, than American domestic students ($m=56.8\%$, $sd=35.1\%$), $t_{105} = 1.970$, $p = .050$, $d = .42$. No such difference was observed in the Chinese sample.

Figures 2. Main Cultural Difference on Perceiving Chinese Nationality as being Granted by Birth (Switched-at-Birth Task Vignette 1: China-born Target).
Across vignettes, Chinese participants, both domestic and international, were reluctant to recognize the adopted child’s nationality as being granted by birth, with their mean nationality ratings below 30%, compared to mean ratings of 50%-60% by U.S participants. As compared to U.S domestic students, U.S international students showed a decreased appreciation of birth origin in attributing nationality. This difference was found statistically significant in Vignette 2. It might be due to the lack of power that this difference did not reach statistical significance in Vignette 1 (where the protagonist’s birth origin was China; \( p > .1, \ d = .15 \)). This finding suggested a possible influence of international experience on U.S participants but not on Chinese participants.

Perceiving Nationality as Acquired through Experience. Next, we conducted the same 2 x 2 ANOVA models on ratings of nationality consistent with adoptive parents (American nationality in Vignette 1 and Chinese nationality in Vignette 2). Results revealed no significant interactions and no main effect of participant’s origin culture or international status. We noticed that ratings on nationality as acquired through experience was higher in Vignette 1 (m=72.2%, sd=25.6%) than in Vignette 2 (m=68.3%, sd=25.7%), \( t_{290}=3.650, p<.001, d=.15 \). Participants across the board considered it as more difficult to acquire Chinese nationality than to acquire American nationality through experience. In this sense, Chinese nationality is essentialized to a greater degree than American nationality, by both Chinese and U.S participants. Overall, Chinese and U.S adults did not differ in the extent to which they view nationality as being acquired through life experience after birth. The relatively high ratings suggested that a flexible account of nationality is acceptable by participants from both cultures.

Figure 3. Decreased Tendency to View American Nationality as being Granted by Birth in American International Students as Compared to American Domestic Students. No Difference between Chinese Domestic and International Students. (Switched-at-Birth Task Vignette 2: U.S-born Target).
**Perceptions on Dual Nationality.** The above analyses revealed an intriguing difference between Chinese and U.S participants on accepting birth origins as determining one’s nationality. Compared to the Chinese participants, U.S participants seem to be more at ease to consider nationality as being granted by birth, without additional requirements on living experience or value assimilation. Nevertheless, Chinese participants were just as ready as U.S participants to see nationality as being acquired through extensive living experience in the host country. We suspect that the difference regarding the birth origin in particular was due to Chinese participants’ lack of tolerance on dual nationality. To test this assumption, we computed a sum score for the two nationality ratings (as being Chinese and being American) from each vignette, and generated an average nationality sum score for each participant. If participants view nationality as mutually exclusive, the sum score should be constrained to 100%. Otherwise, if participants could tolerate dual nationality, it is likely for the sum ratings to be above 100%. Independent-sample t-test results showed that U.S participants generated significantly higher nationality sum scores (m=127.3%, sd=40.0%) than Chinese participants (m=98.2%, sd=14.6%), t\textsubscript{288}=8.858, p<.001, d=.96. It is interesting to note that Chinese participants’ mean nationality sum scores were perfectly close to 100%, suggesting that they perceive individual nationality as one single construct. One-sample t-tests further confirmed that Chinese participants’ mean nationality sum scores were not different from 100%, whereas U.S participants’ mean nationality sum scores were significantly above 100% (ps<.001). This finding indicates that U.S participants have higher tolerance with dual nationality, that they might see different national identity (e.g., being American and being Chinese) as separate constructs, whereas Chinese participants might see one’s nationality as on a single spectrum, that acquiring one nationality necessarily erases the degree of possessing another nationality.

**Social Essentialism Scale**

**Essentialist Ratings of National Groups.** We computed a composite score for participants’ essentialist ratings on naturalness and cohesiveness dimensions respectively, by averaging their scores on corresponding essentialist items (naturalness, immutability and discreteness for naturalness; uniformity, inherence and informativeness for cohesiveness). For each participant, naturalness and cohesiveness scores were averaged across ratings on American and Chinese groups. We conducted a 2 (Essentialism Dimension: Naturalness vs. Cohesiveness) x 2 (Participants Culture) x 2 (International Experience) Mixed-Measures ANOVA on mean essentialist scores. Results revealed a main effect of essentialism dimension (F\textsubscript{1,283}= 5.091, p=.025, η\textsuperscript{2}=.018), as well as an interaction between dimension and participants origin (F\textsubscript{1,283}= 36.447, p<.001, η\textsuperscript{2}=.114). Overall, mean essentialist ratings on the naturalness dimension were higher than essentialist ratings on the cohesiveness dimension. However, U.S participants gave
higher naturalness ratings (m=5.87, sd=1.36) than Chinese participants (m=4.89, sd=1.30), t_{285}=6.057, p<.001, d=.74, regardless of their international status. On the other hand, Chinese participants gave higher cohesiveness ratings (m=5.11, sd=1.21) than U.S participants (m=4.79, sd=1.31), t_{285}=2.142, p=.033, d=.26, see Figure 4. This cultural effect replicated previous evidence on Chinese and American adults’ essentialist ratings on a variety of social categories (including race, gender, occupation, social status etc.; Coley et al., under review). No main effect of international experience was observed in the model. However, further independent-sample t-test revealed that Chinese international students had higher cohesiveness ratings (m=5.38, sd=1.19) than Chinese domestic students (m=4.99, sd=1.21), t_{178}=2.015, p=.045, d=.32, see Figure 5b. No difference was found between American international and domestic students on either dimension of essentialism.

Figure 4. General Cultural Patterns on Essentialist Ratings on National Groups.

Figure 5a & 5b. Comparisons on Mean Essentialist Ratings between Domestic and Abroad American/Chinese Students.
Cohesiveness Ratings Predicted by Arrival Time and Self-Identification. The above finding on the difference between Chinese international and domestic students suggested a possible effect of international experience on increasing essentialist thinking in the Chinese sample. However, given that we are comparing two separate samples of participants, an alternative explanation is that the difference we have observed was not brought by international experience, but other differences between these two samples from the beginning. To address this question, we looked at whether essentialist thinking about nationality groups was predicted by the length of arrival time (in number of months living in the U.S). Regression analyses indicated that arrival time length consistently predicted cohesiveness ratings on relevant national groups (Chinese and American) but not the control group (French). The longer time Chinese international students spent in the U.S, the more cohesive they perceived both their origin nation ($\beta=.307, p=.03, R^2=.094$) and their host nation ($\beta=.275, p=.053, R^2=.076$), see Figure 6 and 7. In addition, we also found that cohesiveness ratings were also predicted by participants’ self-identification score across the board ($\beta=.255, p<.001, R^2=.065$). The more strongly that participants identify themselves with their own nation, the higher cohesiveness ratings they gave on national groups (see Figure 8).

![Figure 6. Chinese International Students’ Arrival Time Length Significantly Predicted Perceived Ingroup Cohesiveness (Chinese).](image-url)
Figure 7. Chinese International Students’ Arrival Time Length Significantly Predicted Perceived Outgroup Cohesiveness (American).

Figure 8. Self Nationality Identification Significantly Predicted Overall Perceived Cohesiveness on National Groups.

*Essentialist Ratings Predicted Nationality Judgments.* We tested whether participants’ responses from the explicit essentialism scale predicted their nationality judgments based on birth from the Switched-at-Birth Task. We ran two separate multiple regression models for the two vignettes to test whether nationality judgements by birth would be predicted by explicit essentialist ratings. Model 1 regressed Chinese nationality judgments (as birth consistent nationality in Vignette 1 from the Switched-at-Birth task) on mean naturalness and cohesiveness ratings on the Chinese category from the explicit essentialism scale.
Results showed that naturalness, but not cohesiveness ratings on Chinese category significantly predicted Chinese nationality judgments in Vignette 1 ($\beta=.260, p<.001, R^2=.064$). Likewise, Model 2 regressed American nationality judgments (as birth consistent nationality in Vignette 2 from the Switched-at-Birth task) on mean naturalness and cohesiveness ratings on the American category from the explicit essentialism scale. Results showed that naturalness, but not cohesiveness ratings on the American category significantly predicted American nationality judgments in Vignette 2 ($\beta=.170, p=.005, R^2=.029$). Across the two vignettes, the more participants view Chinese or American nationality as naturally formed instead of socially constructed concept, the more likely they associate nationality with birth. This result demonstrated the consistency between explicit, abstract reasoning about nationality concepts and perceived nationality for individual cases.

**Table 1.** Naturalness Ratings Predicted Birth-Based Nationality Judgment in Vignette 1 (China-Born Target).

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>SE</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naturalness</td>
<td>.051</td>
<td>.012</td>
<td>.260</td>
<td>4.407</td>
<td>&lt;.001***</td>
</tr>
<tr>
<td>Cohesiveness</td>
<td>-.017</td>
<td>.014</td>
<td>-.075</td>
<td>-1.271</td>
<td>.205</td>
</tr>
</tbody>
</table>

**Model 1:** $R^2=.064, p<.001***

**Table 2.** Naturalness Ratings Predicted Birth-Based Nationality Judgment in Vignette 2 (U.S-Born Target).

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>SE</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naturalness</td>
<td>.033</td>
<td>.012</td>
<td>.170</td>
<td>2.844</td>
<td>.005**</td>
</tr>
<tr>
<td>Cohesiveness</td>
<td>-.014</td>
<td>.013</td>
<td>-.063</td>
<td>-1.062</td>
<td>.289</td>
</tr>
</tbody>
</table>

**Model 2:** $R^2=.029, p=.016$

**Discussion**

The current research investigated how multicultural living experience shapes essentialist beliefs about nationality concepts. We recruited American and Chinese college students with and without study abroad experience, and compared how differently they reason about national identity. We found that the effect of study abroad experience on essentialist beliefs unfolds differently in the two cultural samples. As predicted, American international students showed weaker essentialist thinking in the switched-at-birth task compared to American domestic students. This finding is consistent with previous evidence that exposure to diverse environments attenuates essentialist thinking (e.g., Deeb et al., 2012; Pauker et al.,...
2018), possibly by exposing individuals to greater within group variability as well as between group similarity. However, Chinese international students, surprisingly, showed stronger essentialist thinking than Chinese domestic students, both in the Switched-at-Birth task, and in their explicit essentialist ratings on American and Chinese categories. This result from the Chinese sample goes against our hypothesis and is inconsistent with previous evidence. Overall, the current findings indicated that mere exposure to multicultural environments does not guarantee reduced essentialist thinking about nationality.

Our results showed that international experience interacts with culture in shaping the perception on nationality as being granted by birth. Overall, American participants were more likely to link nationality to birth origin than Chinese participants. This cultural effect is consistent with evidence from other studies showing that American adults were more likely to essentialize social groups as being naturally formed than Chinese adults (Coley et al., under review). This tendency to view nationality as being granted by birth was weaker in American students with international experience (at least in the case of U.S born child) than those without. No effect of international experience was found in the Chinese sample. Previous studies have demonstrated that American and Indian adults hold similar lay beliefs about nationality, that they see it both as inheritable from birth, and at the same time acquirable through personal experience (Rad & Ginges, 2018). They suggested that this combined account on nationality reflects, on the one hand, the general essentialist tendency to view social groups as having common underlying essence; whereas on the other hand, culturally adaptive responses to changing social contexts, which are evolutionarily beneficial for group expansion and assimilation (Rad & Ginges, 2018). Results from the current study expanded these findings to a typical east Asian population, showing that both the inheritable and acquired account on nationality were acceptable (although to different degrees) by both American and Chinese adults. Compared to previous research, a unique design of the current study is that we asked participants to evaluate whether the adopted child possesses the nationality of the birth parents and of the adoptive parents concurrently, on separate scales. This allows participants to report the protagonist, for example, as having 100% nationality of their birth parents, and simultaneously 100% nationality of their adoptive parents. Instead of using the forced choice paradigm, the current design leaves the discretion to participants whether or not belonging to one national group excludes the possibility of belonging to another. Results from the current study demonstrated that, Chinese participants saw national group membership as being exclusive, whereas American participants overall endorsed dual nationality. Note that this difference pattern is also consistent with the different legal policies in the two countries: while the U.S nationality law allows dual citizenship, the Chinese nationality law only recognize single citizenship. It is likely that lay beliefs about nationality is shaped by social reality.

In addition to the switched-at-birth task, the social essentialism scale measures essentialist thinking more explicitly and comprehensively. Again, American participants demonstrated higher
naturalness ratings, and lower cohesiveness ratings than Chinese participants. This main cultural effect is consistent with evidence from other studies that tested Chinese and American adults’ essentialist belief with a wide range of social categories (Coley et al., under review). No difference was found between American international and domestic students in their essentialist ratings on national groups. Chinese international students, however, showed heightened essentialist ratings on the cohesiveness dimension, compared to Chinese domestic students. Further analyses demonstrated a positive relationship between the length of arrival time and cohesiveness ratings among the Chinese international sample: the longer time they have spent in the U.S, the more likely they perceive both their ingroup (Chinese) and outgroup (American) to be homogenous. Together with the results from the Switched-at-Birth task, the current findings suggested that studying abroad experience may increase, instead of decrease, essentialist thinking in Chinese international students.

Results from the current study speak to the importance of using multiple measures of essentialism and to treat it as a multidimensional construct. Previous literature suggested that social essentialism is composed of two related but dissociable dimensions (Haslam et al., 2000): the extent to which a social category is viewed as naturally formed (naturalness), and the extent to which a social category is viewed as homogeneous and meaningful (cohesiveness or entitativity). Past studies have shown that social categories could be essentialized to different degrees on these two spectrums (Haslam et al., 2000; Prentice & Miller, 2007). Therefore, it is important to measure both dimensions of psychological essentialism and not to rely on one single measure. The Switched-at-Birth task, for example, captures the naturalness aspect of essentialism; and the social essentialism scale captures different components of essentialism comprehensively. Compared to the explicit ratings, the Switched-at-Birth task is more implicit in the sense that it does not directly ask participants about their views on the nationality concept. The two measures revealed somewhat different patterns between the American and Chinese sample. The Switched-at-Birth task was more sensitive in detecting the multicultural effect on essentialist thinking particularly with the American sample, given that the explicit scale did not reveal any difference between American domestic and international students. In contrast, Chinese international students showed increased essentialist thinking in both the Switched-at-Birth task and the explicit essentialism scale; their responses were less sensitive to the nature of the task. This lack of sensitivity may be due to Chinese participants’ lack of experience with psychological studies, and less emphasized ideology of political correctness.

The current study bears a number of limitations. Although we intended to measure participants’ essentialist beliefs about nationality, it is possible that participants interpreted the terms of “Chinese” and “American” as racial concepts instead of nationality concepts. We assume that the term “American” could only convey nationality meanings, but not ethnicity meanings, given the relatively high racial diversity in
the U.S. However, it is likely that when seeing the term “American”, participants may be thinking about a typical white American person, and therefore made their judgements based on their essentialist beliefs about racial instead of national identity. We cannot rule out this possibility within the current design of the Switched-at-Birth task. However, in the social essentialism scale task, we included a control category—“French”, which is a different nationality category from the “American” group, but might share the same typical racial image of white. Results from the scale ratings indicated that the length of arrival time in the Chinese international students only predicted change of essentialist ratings on Chinese and American groups, but not on French. This important differentiation indicated that Chinese students were sensitive about the difference between American and French people. Likewise, American participants essentialist ratings on American and French group differed significantly, showing that they also treated American and French group differently. These findings suggested that participants were indeed treating the “American” categories in the sense of nationality, instead of its representative ethnicity, at least in the essentialism scale ratings task. Future research should explicitly instruct participants to reason about nationality meaning instead of ethnicity meaning in each task.

The cross-sectional comparison between domestic and international college students might contain sample bias, that those who are enrolled in study abroad programs may have major differences from those who study domestically. However, we found no effect of gender, ethnicity, sexuality, school year and household annual incomes on participants’ essentialist responses. The positive relationship found between Chinese international students’ arrival time and essentialist ratings provided stronger evidence that the change of essentialist thinking was predicted by the length of living experience in the foreign environment, instead of differences in the demographic background. Ideally, longitudinal studies would be helpful in tracking individual changes over the course of multicultural experience.

Additional contextual factors potentially moderate the multicultural effect on essentialist thinking, but were not captured in the current research. First, the depth of contact with out-group members, including the number of out-group friends and the frequency of contact (Pauker et al., 2018), as well as proficiency level of foreign language skills, may all influence the quality and perception of multicultural experience. Second, the relative status of the interacting groups might change the acculturation dynamics for the immigrants (Amir, 1969). For example, the American international students in China are likely to be perceived as having higher socioeconomic status than local students in general, and in many cases treated as privileged. Therefore, even as a minority social group in China, American international students would feel less threat from the local majority groups and may have a more positive attitude to interact with the local community. In contrast, Chinese international students are more marginalized group in the U.S, with lower status in general, thus are more likely to perceive threat from the local majority groups. In this context, Chinese international students might have stronger
psychological demands to stay more cohesive within their own group, in order to better survive in a threatened environment. As demonstrated in a previous study (Yang et al., 2015), stronger cultural anxiety experienced by the minority group may lead them to adopt essentialism to defend group identity. Besides, it is possible that American international students and Chinese international students in our sample differ in their levels of motivation to study abroad. Whereas American students may have more genuine and stronger willingness to explore the foreign culture, Chinese international students are more likely to be driven by the goal of seeking for better higher education resources or better career opportunities. These factors are beyond the scope of the current study, and should be addressed in future research to elucidate under what conditions does multicultural experience increase or decrease essentialist thinking. Future studies could also investigate what characteristics of the origin and host country, as well as the cultural and social distance between the two might influence the multicultural experience.

**Conclusion**

The current study examined how students with multicultural experience differ from those without such experience with respect to essentialist thinking about nationality concepts by comparing American and Chinese students with and without intensive international experience. We found that multicultural experience interacts with origin culture in predicting essentialist beliefs about nationality, such that American international students showed lower level of essentialist beliefs in the Switched-at-Birth task compared to the American domestic students, whereas Chinese international students showed higher level of essentialist beliefs than Chinese domestic students. We further found that Chinese international students’ arrival time in the U.S significantly predicted their cohesiveness ratings on both ingroup (Chinese) and outgroup (American), suggesting an influence brought by living abroad experience. Our findings shed light on how essentialist thinking may be shaped by dynamic personal experience, addressing the importance to examine the acculturation processes in different cultural and social contexts.
General Discussion

Mental representation of categories structures our organization of knowledge about the world, and guides our perceptions and predictions about novel individuals. Psychological essentialism, as a pervasive cognitive framework, provides a theoretical perspective of understanding how people form concepts. Across three studies, I investigated how culture and personal experience predicts differences in essentialist beliefs in three domains of concepts. Study 1 examined how psychological essentialism applies to crime concepts, and compared essentialist thinking between criminal justice major and non-major college students. Results showed an effect of expertise in predicting lower level of essentialist thinking in those with formal training in criminal justice. Stronger essentialist thinking was found to predict higher culpability and sentencing judgments in lay participants but not criminal justice students. Study 2 examined how psychological essentialism applies to mental and medical disorders, with a particular focus on how culture plays a role in forming lay essentialist beliefs. Results showed a general cultural pattern that American participants were more likely to essentialize disorders as real, naturally formed categories, whereas Chinese participants were more likely to essentialize disorders as coherent, homogenous entities. In both groups, higher essentialist ratings were found to predict lower perceived psychological normality, higher likelihood of diagnosis decisions and higher perceived need for treatment. Study 3 examined how psychological essentialism applies to nationality concepts, with a particular focus on how the experience of studying abroad influences essentialist beliefs about national groups. Results showed that the effect of multicultural living experience on essentialist thinking about nationality unfolds differently in the two cultural samples: American international students showed lower level of essentialist thinking compared to American domestic students, whereas Chinese international students showed higher level of essentialist thinking compared to Chinese domestic students. Further regression analyses revealed that the length of arrival time in the U.S significantly predicted the change of essentialist beliefs on the cohesiveness dimension, within the Chinese international sample. Together, these findings demonstrated how culture and personal experience predicted individual differences in essentialist thinking, providing new evidence on both the universal and malleable nature of psychological essentialism. The current research also suggests that essentialist thinking may lead to important downstream consequences in legal and clinical contexts.

Cultural Differences in Psychological Essentialism

Results from the current studies shed light on cultural variations in essentialist beliefs. First, I found evidence demonstrating overall cultural effects on the general cognitive structure of essentialist thinking with lay concepts of disorders (Study 2) and national groups (Study 3). As compared to American adults,
Chinese adults in our sample were less likely to essentialize concepts as natural kinds, but more likely to essentialize concepts as homogeneous and coherent entities. This cultural pattern echoes evidence from our other studies on Chinese and American participants’ essentialist beliefs about social categories (such as race, gender, sexual orientation, occupation, etc.) in general (Coley et al., under review). The finding that Chinese participants were systematically higher on cohesiveness scales than American participants is consistent with previous evidence that participants from collectivistic cultures were more likely to engage in holistic reasoning styles (e.g., Ji et al., 2000; Nisbett et al., 2001; Nisbett & Miyamoto, 2005).

Compared to Western participants, East Asian participants were more likely to attend to the broad context and perceive entities as a group. This group-level focus may lead participants to perceive group members as homogenous entities, without acknowledging individual-level differences. On the other hand, the finding that Chinese participants were systematically lower on the naturalness scales than American participants may be due to the strong cultural emphasis on the socialization of personal achievement, which favors a more fluid concept of self-identity (Heine et al., 2001). The emphasis on education and self-development requires the assumption that individual abilities could be acquired through hard work. Such a fluid concept of self-identity opposes to a fixed account that sees individual identity as being determined at birth and not open to later change. Therefore, it is likely that the cultural orientation on gaining self-development leads to a weaker tendency to essentialize categories as being determined by an underlying biological essence.

It is important to note that results from the current research presented not only cultural variations but also cultural similarities in essentializing categories. For example, results from Study 2 showed that both American and Chinese participants essentialized medical disorders as “real” categories more than mental disorders. This pattern is consistent with previous findings that American lay and experts held stronger essentialist beliefs about medical disorders than mental disorders (Ahn et al., 2006). The similarities of essentialist reasoning patterns across cultural samples added evidence on the pervasive and universal nature of psychological essentialism. Besides, the consistency between cultural patterns that we have observed across content domains (e.g., American participants were higher on naturalness and Chinese participants were higher on cohesiveness in Study 2 & 3) suggested a common underlying mechanism in lay people’s understanding of concepts. Results from the current research indicated that cultural effects on psychological essentialism could occur at a higher, broad level of the mental representation structure, which may systematically influence the ways in which we organize concepts across different domains. Together, the current findings shed light on the domain-general nature of psychological essentialism, as a basic cognitive framework that people intuitively apply to understand the world.
Experience-Based Differences in Psychological Essentialism
The current research shed light on how psychological essentialism could be predicted by personal experience. First, results from Study 1 demonstrated that formal training in criminal justice was associated with decreased essentialist thinking about crime concepts. Participants major or minor in criminal justice were less likely to conceptualize crimes as naturally existing categories, and with coherent, uniform instantiations. Importantly, although essentialist beliefs predicted both culpability and sentencing decisions in lay participants, criminal justice students were immune to the essentialist effect in making such decisions. This finding is consistent with previous findings on how expertise changes fundamentally the way how people organize the mental representation of concepts (e.g., Shafto & Coley, 2013; Smith et al., 2013). It is likely that a deeper level understanding of the content field may: 1) help people to realize that the concepts that they study are possibly created as social constructs by humans, instead of being naturally discovered as an absolute existence, which may undergo changes over the years and across societies; and 2) expose people to considerable variability among individual instances, thus helps them to notice the lack of consistency within the same concept category. The effect of expertise is also shown in previous studies that practicing clinicians were less likely than novices to essentialize mental disorders as natural kinds (Ahn et al., 2006).

Results from Study 2 seem to contradict with these theoretical assumptions and empirical evidence on the expert effect, by showing that essentialist thinking of mental disorders as natural kinds increased, rather than decreased, with the level of familiarity to clinical guidelines of mental disorder classifications. However, I argue that, given the low expertise level of the participants, findings from Study 2 demonstrated how initial exposure to a content field may increase the tendency to essentialize mental disorders, whereas further training may decrease essentialist thinking at a later stage. Besides, it is also important to note that concepts may vary in the extent to which the possibility of an underlying coherent causal mechanism agrees or contradicts with current scientific understanding or consensus in the content area. For example, crimes may be more likely to be considered as socially constructed concepts than mental disorders, as there is still much controversy over the cause of mental disorders, whether it is neurological, genetic, or situational. These differences in expert understanding of concepts may lead to different patterns of expertise effects on essentialist thinking with concepts in different content domains.

The current research also shed light on how personal experience of studying abroad shapes essentialist beliefs. Results from Study 3 indicated that, multicultural living experience interacts with cultural background in predicting essentialist understanding about national groups. Critically, I found that experience living internationally does not guarantee decreased essentialist thinking. Rather, it is important to observe the hypothesized effect under specific social and cultural contexts that participants were situated in. Contrary to the American students sample where international studying experience seems to
decrease essentialist thinking about national groups, the Chinese students samples showed the opposite effect: those with studying abroad experience were more likely to essentialize both their ingroup and outgroup as homogenous compared to those without studying abroad experience; and the increase of essentialist thinking within the Chinese international group was predicted by the length of time they lived in the U.S. Studying abroad experience did predict essentialist thinking, although the direction of the effect is likely to interact with additional contextual factors such as relative group status, as well as motivation, depth and quality of intergroup contacts.

Results from the current research provided new evidence on how personal experience in formal training or international migration predicts individual indifferences in essentialist thinking. Expertise-based differences suggest that experience may decrease essentialist beliefs, although this effect may depend on the stage of training, as well as the current scientific consensus on the nature of the concept. Essentialist thinking may also be attenuated by multicultural living experience under certain circumstances, although this effect may go to the opposite direction based on contextual moderators. Again, results from the current research not only presented differences but also similarities in essentialist thinking between the groups. For example, although criminal justice major/ minor students showed significantly lower level of essentialist thinking than lay students, there was still evidence that they essentialized some crime types, such as murder, as naturally defined; or embezzlement, as coherent concept. Likewise, American and Chinese students both with and without international studying experience all showed some level of essentialist thinking about national groups, the differences were relative. Thus, I do not argue that formal training or multicultural experience erases essentialist reasoning. Instead, it is likely to adjust the level of essentialist thinking to a certain degree. Together, the current findings speak to both the universal and malleable nature of psychological essentialism.

**Psychological Essentialism as a Multi-Faceted Construct**

The current research addresses the importance of using two-dimensional models as well as using multiple measures to examine individual differences in psychological essentialism. The two-dimensional model of psychological essentialism proposed that categories could be essentialized along two conceptually related but dissociable dimensions: naturalness and cohesiveness (Haslam et al., 2000). However, the majority of past research on studying psychological essentialism heavily relied on single measures, and treated it as a single dimension construct (e.g., Roberts et al., 2017; Pauker et al., 2018; Yang et al., 2015). Findings from the current studies across the board demonstrated that culture or experience-based difference patterns in essentialist thinking exhibited differently on its two sub-dimensions. For example, we found different cultural patterns of essentializing disorders on the naturalness and cohesiveness dimension. Compared to U.S participants, Chinese participants were lower on the naturalness scale but higher on the
cohesiveness scale. Likewise, familiarity with clinical guidelines on mental disorders significantly predicted naturalness, but not cohesiveness ratings in Chinese participants. Treating essentialist thinking as a single-dimension construct or using single measures may fail to capture the nuanced ways in which culture or experience predicts essentialist beliefs.

Future research should explore more implicit measures of psychological essentialism as an important supplement to current paradigms. Although often related, explicit measures and implicit measures of essentialism may yield different result patterns. For example, results from Study 3 showed that American international students were less essentialist than American domestic students on the implicit measure (Switched-at-Birth), whereas such difference was not detected in the explicit essentialism scale ratings. Given the awareness of political correctness in American participants, it is possible that the explicit essentialism scale was not capturing the true perceptions of the American participants, thus was less sensible of detecting the hypothesized effect. It is important for future studies to continue exploring implicit measures of psychological essentialism to ensure test validity.

**Downstream Consequences of Psychological Essentialism**

The current research explores the consequences of essentialist thinking in criminal justice and clinical decision-making. Results from Study 1 indicated that essentialist thinking systematically predicted culpability and sentencing decisions in lay people: stronger tendency to essentialize crime concepts might lead to heightened perception of guilt and stronger willingness to punish. Even though this pattern was not observed in the criminal justice major sample, given that the jury of criminal court is comprised of lay people without formal legal training, this finding suggested significant legal implications of essentialist thinking in criminal justice. Likewise, results from Study 2 provided initial evidence that essentialist beliefs about mental disorders may influence perceived psychological normality, positive diagnosis decisions, as well as need for treatment judgments, at least in some cases. These findings suggested that lay essentialist beliefs about mental disorders may have significant implications in clinical diagnosis and patients’ treatment seeking behaviors. Although we did not directly test real life consequences of essentialist thinking about nationality in Study 3, previous literature suggested that social essentialism may be a strong predictor of stereotype endorsement and dehumanization (Bastien & Haslam, 2006; Haslam et al., 2005). Perceiving nationality as a natural and coherent concept may lead to different attitudes and approaches for international students to engage in the host culture, and may influence the quality and outcome of their cultural adaptation. Together, results from the current research added to the literature that essentialist thinking not only scaffolds the basic cognitive structure of mental representation, but also influences important judgment and decision-making in real life.
Limitations and Future Directions

The current research investigated how cultural and personal experience predicts differences in essentialist thinking in three different domains. Across three studies, I have demonstrated cultural and experience-based difference patterns in essentialist thinking, in the domain of crime, disorder and nationality concepts. Nevertheless, it is important to note that the nature of the current studies, including the cross-sectional comparisons between cultural samples and expert-lay groups, is correlational instead of causal. The current studies are to a large extent exploratory in looking for individual difference patterns in essentialist thinking. Based on the current findings, it is important for future research to experimentally test causal hypothesis on the underlying mechanisms of such effects. For example, future studies could prime participants to engage in holistic/collectivistic and individualistic thinking styles, and observe whether it would lead to different levels of essentialist thinking as a consequence. Future studies should also use longitudinal designs to track how formal training or multicultural living experience shapes essentialist thinking in individuals over time.

Given the limited scope of the current research, I was not able to systematically examine how culture interacts with personal experience in predicting essentialist thinking in each of the three domains simultaneously. Rather, each of the three studies provided some evidence on how essentialist thinking may be influenced by cultural or experiential inputs in the corresponding domain. It would be ideal if each of the three studies could include cross-cultural samples of participants with and without expertise training. This would allow us to conduct parallel analyses across domains to simultaneously examine the effect of culture and expertise on essentialist thinking, and to compare whether such effects vary as a function of content domains.

Another limitation of the current research is that the samples I included were limited in both the range of cultural variances and the range of expertise. Although I recruited participants from both western and east Asian societies, most of them were living in urban environments among the most economically developed regions. It would be ideal to reach out to more diverse cultural samples to represent populations that may share fundamentally different historical background, cultural or religious beliefs, economic and social life styles etc., from the traditional western samples. Likewise, it would also be important to expand the range of expertise of participants in the target area, so as to provide a more comprehensive understanding about how early and continuous exposure to formal training affects essentialist thinking along the way.

Future research should address the importance of combining qualitative with quantitative methods to document how specific cultural beliefs and discourses may influence the fundamental ways in which people form category concepts, and the extent to which such cultural influences are open to change. It is also important for future research to take a developmental approach to look into how and
when does cultural influence on essentialist thinking take place in children, and to identify whether some sources of external inputs (e.g., parental, school, district, or society level) are more influential than others.

Conclusions

Across three studies, the current research examined how culture and personal experience shapes essentialist thinking. I found that: 1) culture may systematically influence the broad cognitive structure of how people essentialize concepts; 2) expertise was associated with lower level of essentialist beliefs about crime concepts which are likely to be viewed as social constructs; 3) initial exposure to mental disorder knowledge was associated with higher level of essentialist beliefs about mental disorders, the cause of which remains unclear to contemporary science; and 4) experience of studying abroad predicted differences in essentialist beliefs about national groups, the effect of which went in opposite directions in the two cultural samples, likely to be moderated by relative group power status, motivation, depth and/or quality of intergroup contacts. The current results provide new empirical evidence on essentialist thinking about crime, mental disorder, and nationality concepts, and expand previous literature on psychological essentialism to the Chinese population. Findings from the current research shed light on the universal and malleable nature of essentialist thinking, suggesting that it is likely to be a domain-general cognitive construct that people intuitively apply to scaffold their understanding about the world. The current research addresses the important real-life consequences of essentialist thinking in culpability and sentencing judgments, as well as mental disorder diagnosis and need for treatment decisions.
References


Massachusetts Criminal Model Jury Instructions (March 2017).
Maine Pattern Criminal Jury Instructions (2017 Revisions).


### Appendix A. The Complete List of Crime Vignettes with Mean Intent, Violence, and Consequence Ratings.

<table>
<thead>
<tr>
<th>Crime Type</th>
<th>Version</th>
<th>Vignette</th>
<th>Intent Rating</th>
<th>Violence Rating</th>
<th>Consequence Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rape</td>
<td>1</td>
<td>A man waits at night in a parking garage for a woman to leave work. He sneaks up from behind her and grabs her. He rapes her and uses repeated acts of violence while the woman resists.</td>
<td>10.0</td>
<td>10.0</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>A man waits at night in a parking garage for a woman to leave work. He plans to sneak up from behind, grab her, and rape her, but runs off when security staff notices him.</td>
<td>10.0</td>
<td>3.6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>A man is at a party with fraternity brothers; he is talking and drinking socially with a girl from a sorority. Very late at night, the two began to get physically close. Soon after they begin to have sex, he realizes that she is actually unconscious. She may wake up briefly and mumble “stop”, but he continues to have sex with her.</td>
<td>4.2</td>
<td>8.0</td>
<td>9.2</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>A man is at a party with fraternity brothers. He is talking and drinking socially with a girl from a sorority. Very late at night, they begin to get physically close. He tries to have sex with the girl but realizes that she is actually unconscious. He tries to continue but cannot because of her resistance.</td>
<td>5.0</td>
<td>7.8</td>
<td>3.0</td>
</tr>
<tr>
<td>Arson</td>
<td>1</td>
<td>A man brings a fuel can and a lighter to an apartment building where he used to live. He waits until 3am and then lights the building on fire. No one is killed but two of the residents have severe injuries and many more were hospitalized for smoke inhalation. This event causes $1.2 million in private property damage.</td>
<td>9.6</td>
<td>7.2</td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>A man brings a fuel can and lighter to an apartment building where he used to live. He contemplates lighting the building on fire and waits until 3am, but decides to run away when a tenant happens to see him.</td>
<td>8.8</td>
<td>1.2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>A man is camping alone and creates a fire to sit around. He isn’t careful and doesn’t take appropriate precautions. He isn’t paying attention and the fire starts to spread very quickly. Within a few minutes, an area of</td>
<td>0.5</td>
<td>2.5</td>
<td>8.0</td>
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</tbody>
</table>
several square feet is fully engulfed, and
within a short time a full-blown forest fire.
Several homes are destroyed.

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<tbody>
<tr>
<td>4</td>
<td>A man is camping alone and is preparing dinner with a portable stove. While preparing dinner, he accidentally bumps into one of the legs that hold the stove up. This sends the stove to the ground with the flame still burning. The fire burns for half an hour until firefighters come. The fire causes loss of $500.</td>
<td>0</td>
<td>1.0</td>
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</table>

**Murder**

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</thead>
<tbody>
<tr>
<td>1</td>
<td>A man walks into a random home, pulls out a handgun, and shoots the homeowner at point-blank range in the back of the head. The victim dies instantly.</td>
<td>10.0</td>
<td>9.4</td>
</tr>
<tr>
<td>2</td>
<td>A man walks into a random home wielding a handgun. He aims it at the homeowner and pulls the trigger. However, the gun malfunctions and no bullet is released. The man then flees the scene and the homeowner survives.</td>
<td>10.0</td>
<td>7.8</td>
</tr>
<tr>
<td>3</td>
<td>A man is driving home from movie late at night. He is sending a text message when the car hits someone crossing the road. He is so scared that he drives away. The injured man dies the next day because of excessive loss of blood.</td>
<td>3.0</td>
<td>8.2</td>
</tr>
<tr>
<td>4</td>
<td>Two men engage in a fistfight outside a bar. During the fight, one man inadvertently knocks the other unconscious. The unconscious man is rushed to the hospital. He is treated by doctors for a concussion before being released.</td>
<td>5.6</td>
<td>7.2</td>
</tr>
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</table>

**Theft**

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<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>A man follows a girl on the street and steals her purse (with $1000 cash inside) while she is not paying attention.</td>
<td>9.6</td>
<td>1.2</td>
</tr>
<tr>
<td>2</td>
<td>A man follows a girl in the street and tries to steal her purse. As he is taking the purse out of her pocket, a police car drives by and he drops the purse on the ground. He flees the scene without taking anything.</td>
<td>9.6</td>
<td>2.0</td>
</tr>
<tr>
<td>3</td>
<td>A man is having lunch in a restaurant when he sees a woman left her purse at the next table. Since nobody is around, he takes the purse. It contains approximately $1000.</td>
<td>4.6</td>
<td>.2</td>
</tr>
<tr>
<td>4</td>
<td>A man buying groceries notices that the customer ahead of him left his wallet at the checkout counter. The man is unable to find</td>
<td>1.8</td>
<td>.2</td>
</tr>
</tbody>
</table>
the customer so he takes it home. There is a $20 bill inside.

<table>
<thead>
<tr>
<th>Robbery</th>
<th>Scenario</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A man follows a girl in the street and threatens her with a knife. He robs $500 cash, bank cards, an iPhone 6, and a handbag from her.</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.6</td>
</tr>
<tr>
<td>2</td>
<td>A man rushes into an Apple store and threatens the sales girl to give him the most valuable products. In the rush he mistakenly takes a display model that is actually valued at $20 and runs away.</td>
<td>9.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.6</td>
</tr>
<tr>
<td>3</td>
<td>A man goes shopping in Best Buy. He stares at the newest Surface Pro 3 and can’t help but want to take it home. He tries to borrow money from friends but nobody will lend him any. When wandering in the store, he notices that there is only one female staff member on duty. He grabs the Surface Pro. The girl starts to cry. He warns her not to move and runs away.</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.4</td>
</tr>
<tr>
<td>4</td>
<td>A man is wandering in the street. He passes by a convenience store and sees the staff member counting cash by herself. He rushes in and grabs the cash, but is caught on the spot.</td>
<td>4.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.8</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Burglary</th>
<th>Scenario</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A man breaks into a house in a late night with a baseball bat. He takes cash and other assets with a total value of $5000.</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9.0</td>
</tr>
<tr>
<td>2</td>
<td>A man breaks into a house with a gun late at night. A couple sleeping in the bedroom hear the noise and wake up. They dial 911. The man hears the police car and flees without taking anything.</td>
<td>8.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>3</td>
<td>A man is wandering in the street at night. He passes by a house and sees the window left open. He climbs into the room and finds an Apple watch and some jewelry with a total value of $5000. Right then, the girl who lives in the house comes back and is shocked by the scene. He pushes her down on the floor and runs away.</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.6</td>
</tr>
<tr>
<td>4</td>
<td>A man is wandering in the street at night. He passes by a house and sees the door left open. He enters the house and sees some cash on the table. He tries to take the cash but the guy who lives in the house comes back right in time. The man gives up the cash and runs away.</td>
<td>5.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>Embezzlement</td>
<td>Description</td>
<td>Score 1</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td>----------</td>
</tr>
<tr>
<td>1</td>
<td>A businessman acquires possession of funds for clients. He diverts 1% of the funds to a private fund in his name in an offshore account ($10000).</td>
<td>10.0</td>
</tr>
<tr>
<td>2</td>
<td>A businessman acquires possession of funds for clients. He begins setting up offshore accounts to divert 1% of the funds in his name ($10000), but he is fired from the fund before he actually gets anything.</td>
<td>10.0</td>
</tr>
<tr>
<td>3</td>
<td>A businessman acquires possession of funds for clients. He usually charges 0.5% of the transaction as commission fee. One day, the system encounters a technical problem which mistakenly transfers 5% of a big transaction to his own commission account ($10000). He chooses not to report to the client.</td>
<td>2.4</td>
</tr>
<tr>
<td>4</td>
<td>A businessman acquires possession of funds for clients. He usually charges 0.5% of the transaction as commission fee. One day, the system encounters a technical problem, which mistakenly transfers 5% of a small transaction to his own commission account ($100). He chooses not to report to the client.</td>
<td>2.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drug Violations</th>
<th>Description</th>
<th>Score 1</th>
<th>Score 2</th>
<th>Score 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A man sets up a meeting with his drug dealer, goes to the meeting spot, acquires cocaine, pays cash, and leaves.</td>
<td>10.0</td>
<td>0</td>
<td>8.0</td>
</tr>
<tr>
<td>2</td>
<td>A woman sets up a meeting with her drug dealer to buy cocaine and goes to the meeting spot. There’s a parade happening and they can’t meet up.</td>
<td>10.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>A college student goes to a party. The police break up the party and in the chaos someone slips a bag of cocaine in their pocket.</td>
<td>1.0</td>
<td>.4</td>
<td>4.2</td>
</tr>
<tr>
<td>4</td>
<td>A college student goes to a party and sees a bong on the table. He is about to take a hit but the police break up the party, and he leaves.</td>
<td>4.4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Appendix B. Switched-at-Birth Task Materials.

Vignette 1 (China-Born Target).
A child was born to a Chinese family (Mr. and Mrs. Wang) in China, but adopted by an American family (Mr. and Mrs. Green). The child was brought to the U.S at six months old. The child grew up happy and well loved.

Please use the information below to make your best guess about what characteristics this child would have at your age. Remember, the child was born to a Chinese family (Mr. and Mrs. Wang) in China but raised by an American family (Mr. and Mrs. Green) in the U.S.

1) Mr. and Mrs. Wang like cats more than dogs. Mr. and Mrs. Green like dogs more than cats. Which will the child prefer?

2) Mr. and Mrs. Wang are short. Mr. and Mrs. Green are tall. Which will the child be?

3) Mr. and Mrs. Wang are calm. Mr. and Mrs. Green are anxious. Which will the child be?

4) Mr. and Mrs. Wang believe that eating meat is healthy. Mr. and Mrs. Green believe that eating meat is unhealthy. Which will the child believe?

5) Mr. and Mrs. Wang are better at soccer than swimming. Mr. and Mrs. Green are better at swimming than soccer. Which will the child be better at?

Vignette 2 (U.S-Born Target).
A child was born to an American family (Mr. and Mrs. Louis) in the U.S, but adopted by a Chinese family (Mr. and Mrs. Li). The child was brought to China at six months old. The child grew up happy and well loved.

Please use the information below to make your best guess about what characteristics this child would have at your age.

Remember, the child was born to an American family (Mr. and Mrs. Louis) in the U.S but raised by a Chinese family (Mr. and Mrs. Li) in China.
1) Mr. and Mrs. Louis like potato chips more than candy. Mr. and Mrs. Li like candy more than potato chips. Which will the child prefer?

2) Mr. and Mrs. Louis are overweight. Mr. and Mrs. Li are slim.

Which will the child be?

3) Mr. and Mrs. Louis are outgoing. Mr. and Mrs. Li are shy.

Which will the child be?

4) Mr. and Mrs. Louis believe there is an afterlife. Mr. and Mrs. Li believe there is no afterlife.

What will the child believe?

5) Mr. and Mrs. Louis are better at music than the computer. Mr. and Mrs. Li are better at the computer than music.

Which will the child be better at?