

CULTURE WITHIN: AN EXPLORATION OF THE EFFECTS OF SOCIAL CLASS  
AND REGION ON THE SELF AND COGNITIVE HABITS

by

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## Abstract

Culture's psychological impact stretches from some of the most basic perceptual processes to higher order reasoning. Yet much less is known about the impact of group differences within cultures due to factors such as social class, geographic region, or religion. Exploring within-culture differences not only provides insight into the psychological consequences of these factors, but can also inform our understanding of the mechanisms by which cultural differences operate and are maintained.

In Chapter 2, I explore the effects of culture and social class on cognitive habits (attribution, patterns of visual attention, and reasoning about change) and symbolic representation of the self. Russians demonstrated more holistic cognitive patterns and less symbolic self-inflation than Americans; people from working-class backgrounds demonstrated more holistic cognitive patterns and less symbolic self-inflation than those from middle-class backgrounds. Furthermore, for both group comparisons, cognitive differences were partially mediated by differences in self-inflation, suggesting a common mechanism may underlie both group differences.

In Chapter 3, I examined whether social class differences in causal inference might be due to relatively automatic or controlled processes. Previous research has found that cultural differences in causal inference appear to be due to differences in early-stage processing of personality-relevant information. Using an ERP paradigm, we found results for social class that were largely parallel to the previously observed cross-cultural

difference, suggesting that differences in attribution related to culture and to social class both likely arise from automatic inference processes.

In Chapter 4, I tested the voluntary settlement hypothesis by exploring regional variation in naming practices both within the US and Canada and comparing countries recently settled by Europeans with European countries. The voluntary settlement hypothesis (Kitayama, et al., 2010) holds that areas that were more recently frontiers both select for individuals who are more independent and promote independent values and behaviors. I found that popular names were less prevalent in US states and Canadian provinces that were more recently frontiers. The same pattern was observed comparing countries recently settled by Europeans with European countries, suggesting that the settling of frontiers has led to parallel differences both across and within countries.

## Chapter 1:

### Introduction

Over the past 20 years social psychologists have found a renewed interest in culture. Cross-cultural comparisons have revealed that cultures differ in a host of domains including, emotional experiences (Kitayama, Mesquita, & Karasawa, 2006; Tsai, 2007), emotional inference (Masuda, Ellsworth, Mesquita, Leu, Tanida, & Van de Veerdonk, 2008), well-being (Diener, Diener, & Diener, 1994), rumination (Grossmann & Kross, 2011), conformity (Bond & Smith, 1996), perspective taking (Cohen, Hoshino-Browne, & Leung, 2007), and social support seeking (Kim, Sherman, & Taylor, 2008). In fact some of the most well studied social psychological phenomena have been found to be influenced by culture. For example, while both Westerners and East Asians experience cognitive dissonance, they do so in response to different types of choices and in different contexts. Westerners experience cognitive dissonance when making choices for the self, but not for close others, whereas East Asians show the opposite pattern (Hoshino-Browne, Zanna, Zanna, & Kitayama, 2005). Additionally, Westerners display dissonance when making choices in private, but not when the presence of social others is primed, here again East Asians show the opposite pattern (Imada & Kitayama, 2010).

Even the Fundamental Attribution Error, does not seem to be universal. Several studies have shown that East Asians are less prone to dispositional bias than Americans (Choi & Nisbett, 1998; Kitayama, Ishii, Imada, Takemura, & Ramaswamy, 2006; Masuda & Kitayama, 2004). Grossmann and Varnum (2011) recently found parallel differences

when comparing Russians and Americans. Given these findings that even classic social psychological phenomena are culturally influenced (and in some cases culturally bound) psychologists must take into account the potential role of culture or run the risk of creating ethnographies rather than broader accounts of human thought and behavior. Although cultural psychology has explored the effect of culture on a variety of psychological processes, two of the most studied and arguably most important areas have been how the self is viewed and cognitive habits.

### Social Orientation

Cultures differ in how they view the self, with independent social orientation being more prevalent in some societies (such as the US, Canada, and the UK), and interdependent social orientation being more prevalent in others (such as Japan, China, and Russia). Generally speaking, cultures can be thought of as placing greater emphasis on the individual or on relationships (see Table 1.1). According to Varnum and colleagues (2010):

Cultures that endorse and afford independent social orientation tend to emphasize self-direction, autonomy, and self-expression. Cultures that endorse and afford interdependent social orientation tend to emphasize harmony, relatedness, and connection. Independently oriented cultures tend to view the self as bounded and separate from social others, whereas interdependently oriented cultures tend to view the self as interconnected and as encompassing important relationships (e.g., Markus & Kitayama, 1991; Triandis, 1989). In independently oriented cultural contexts, happiness is most often experienced as a socially disengaging emotion (i.e., pride), whereas in interdependently oriented cultural contexts, happiness is most often experienced as a socially engaging emotion (i.e., sense of closeness to others; Kitayama, Mesquita, & Karasawa, 2006). Finally, in cultures that have an independent social orientation, people are more motivated to symbolically enhance the self at the expense of others; this tendency is not as common in interdependently oriented cultures (Kitayama, Ishii, Imada, Takemura, & Ramaswamy, 2006; Kitayama, Mesquita, et al., 2006).

What unites different aspects of an independent social orientation is a focus on the self as autonomous, and a desire to express uniqueness and personal agency. In contrast,

interdependent social orientation is characterized by a strong emphasis on close relationships and a desire to promote and affirm these ties.

### Analytic vs. Holistic Cognitive Habits

Another major dimension of cultural difference, is the tendency to think analytically or holistically (see Table 1.2). Western societies tend to be characterized by more analytic cognitive patterns, while East Asian and Eastern European societies tend to be characterized by more holistic cognitive patterns. According to Varnum and colleagues (2010):

Analytic cognition is characterized by taxonomic and rule-based categorization of objects, a narrow focus in visual attention, dispositional bias in causal attribution, and the use of formal logic in reasoning. In contrast, holistic cognition is characterized by thematic and family-resemblance based categorization of objects, a focus on contextual information and relationships in visual attention, an emphasis on situational causes in attribution, and dialecticism (Nisbett, Peng, Choi, & Norenzayan, 2001). What unites the elements of the analytic style is a tendency to focus on a single dimension or aspect—whether in categorizing objects or evaluating arguments—and a tendency to disentangle phenomena from the contexts in which they are embedded—for example, focusing on the individual as a causal agent or attending to focal objects in visual scenes. What unites the elements of the holistic style is a broad attention to context and relationships in visual attention, categorizing objects, and explaining social behavior.

These different cognitive habits are evident not only in reasoning about the social world, for example in inferring whether internal traits or contextual factors caused another person's behavior (i.e. Kitayama et al., 2006), but also in non-social cognition such as the ability to replicate the exact length of a line or the proportion of a line to a frame (Kitayama, Duffy, Kawamura, & Larsen, 2003).

### The Social Orientation Hypothesis

Theorists since at least the time of Tönnies (1887/2002) have suggested that the way we view the self has consequences for other types of reasoning. Further, cultural differences in the self have been proposed as an explanation for differences in a variety of

cognitive habits, including narrow vs. contextual visual attention, situational vs. dispositional inferences about the cause of others' behavior, different lay theories of causality, categorizing objects according to formal rules or thematic relations and overall resemblance, taking 1<sup>st</sup> vs. 3<sup>rd</sup> person perspectives when recalling events, and analytic vs. dialectical reasoning about contradiction, to name a few (see Markus & Kitayama, 1991; Nisbett, 2003; Norenzayan et al., 2007).

Two major lines of research have provided evidence in support of the social orientation hypothesis. First, social orientation and cognitive habits tend to co-vary, such that if Group A is more independent than Group B, Group A is also more analytic (for a review see Varnum et al., 2010). Second, priming different social orientations leads to corresponding shifts in cognition; those primed with independence demonstrate more analytic cognitive patterns, whereas those primed with interdependence show more holistic cognition. A recent meta-analysis found these effects across a variety of different primes and dependent variables, and for both European-American and Asian-American participants (Oyserman & Lee, 2008).

#### Models of Between- and Within- Culture Differences

In this view, contemporary psychological differences between cultural groups arose due to a combination of distal factors including environmental conditions, self-selection, population density, and social and economic organization (see Figure 1; see also Nisbett, 2003). These differences are maintained through institutions and social norms (Markus & Kitayama, 1991; Gelfand et al., in press) and are passed on through socialization practices (Bornstein et al., 1990; Markus & Kitayama, 1991). More proximally, the types of situations that are common in different cultural milieus and the

affordances and constraints they provide (Kitayama, Markus, Matusmoto, & Norasakkunkit, 1997) in addition to chronic priming of different types of social orientation (Oyserman & Lee, 2008; Oyserman, Sorensen, Reber, & Chen, 2009) maintain cultural differences in social orientation and cognitive habits, and may lead to functional neural differences (for a review see also Kitayama & Uskul, 2010).

More recently, evidence has emerged to suggest that the distribution of genotypes related to neurotransmitters like serotonin, specifically 5HTTLPR may also play a role in the origin and maintenance of cultural differences in social orientation (Chiao & Blizinsky, 2010). Specifically, national S-allele prevalence was associated with higher levels of country-level collectivism. Other work has suggested that polymorphisms of 5HTR1A (another gene linked to serotonin reception) may act differently in American and Korean populations, such that those with the homozygous G genotype (which is related to decreased response to changes in reinforcement) report more culturally typical patterns of cognition (analytic vs. holistic) compared with those who are carriers for the C genotype (Kim et al., 2010). The emerging field of cultural neuroscience has also shown that functional neural differences are associated with differences in independence vs. interdependence (e.g., Chiao et al., 2009; 2010; Zhu, Zhang, Fan, & Han, 2007). In the present model, these neural differences are viewed as likely influenced by genes and socialization (see Figure 1.1).

This model may or may not provide a good description of how within-culture differences are created and maintained. In the case of regional variation, this model may provide a plausible description of the creation and maintenance of differences in psychological tendencies. In the case of social class differences and differences between



age cohorts this model may not be as useful. In the case of social class, it is less likely that there are differences in genotype between groups and differences in the conditions of work environments likely play a larger role than they do in the case of cultural differences. In the case of differences between religious communities, the tenants of belief and the practices of religious observance are likely to be key. For example, compared to Catholics, Protestants tend to be less relationally attuned in work settings, which likely reflects the Protestant Work Ethic (Sanchez-Burks, 2002). Religious ideology has also been shown to influence patterns of visual attention (Clozato, et al., 2010) with Calvinists (whose religious ideology emphasizes the individual) showing more global patterns of attention than Jews and Catholics (whose religious ideology is more focused on the community). Cohen and colleagues (2011) report similar findings, with Protestants showing greater dispositional bias than Atheists, a finding that was mediated by belief in the soul. Finally, in the case of age cohorts, cohort specific events (such as the Great Depression and Second World War), changes in residential and occupational mobility, and perhaps the aging process itself are likely to be more relevant than more distal factors or genetic variation.

#### Limitations of Cross-Cultural Approaches

The current literature documenting cross-cultural differences has provided a strong challenge to universalist accounts of human psychology and has caused social and cognitive psychologists to begin to take culture into account. While studies comparing cultures within these regions have shed a great deal of light on how culture influences the way we think from the emotions we experience to what parts of the physical world we attend to it, this line of research has not been without limitations. One major limitation of

the cross-cultural approach has been that it has primarily compared two cultural regions, North American and East Asia which differ in a number of important variables. For example North American and East Asian societies differ in terms of, 1) political systems (and the length of time in which democratic institutions have been in place), 2) economic systems and policies, 3) ethnic homogeneity, 4) religion and religiosity, 5) philosophical systems which have been culturally influential, 6) population density, 7) languages and linguistic structure, 8) the prevalence of different dopaminergic and serotonergic genotypes. This list is by no means exhaustive, yet given these differences it is difficult to isolate the key ingredient that may lead to say, the difference between Americans and Chinese in patterns of visual attention.

Similarly, this approach limits the ability of researchers to isolate causal relationships among variables of interest (such as social orientation and analytic vs. holistic cognitive habits), which tend to co-vary when comparing North Americans and East Asians. The fact that views of the self and cognitive habits tend to co-vary when comparing other cultural groups provides stronger evidence for the social orientation hypothesis, however it is the fact that this covariation occurs when comparing groups that make the hypothesis far more plausible (Varnum et al., 2010).

The approach of comparing North American and East Asian societies is also limiting, in that there are cultural differences in psychological processes which are not captured by this comparison, including differences in color perception (Roberson, Davies, & Davidoff, 2000), susceptibility to the Müller-Lyer illusion (Segall, Campbell, & Herskovitz, 1966), fairness and cooperation (Henrich et al., 2006; 2010), and punishment (Henrich et al., 2006; 2010; Marlowe, et al., 2008), to name a just few. On these

dimensions the more, it is more revealing to contrast small and large scale societies (Henrich, Heine, & Norenzayan, 2010). Similarly, differences in aggressive response to insults, also known as “Culture of Honor,” tends to differ among Northerners and Southerners in the US (Cohen et al., 1996) and likely also varies when comparing cultures that are less mobile and where institutions are more developed and law enforcement reliable with cultures where this is not the case (such as nomadic and herding societies). These findings suggest that focusing solely on these two cultural regions (North American and East Asia) may lead psychologists to overlook how culture affects a number of psychological processes.

Finally, another major limitation of the cross-cultural approach, and specifically the body of work comparing North Americans and East Asians, is that it assumes greater psychological homogeneity within cultures than may actually be present. Typically, cross-cultural studies have neither statistically controlled for, nor systematically designed research that explores the role of within-culture variables such as social class, age, religious affiliation, or region on the variables of interest.

#### Within-Culture Approaches

Given the limitations of cross-cultural approaches, cultural psychologists have begun to explore the impact of within-culture variables. There are several advantages to utilizing within-culture designs and designs that combine both within and between cultural comparisons, but I will focus on four. 1) Such studies provide insight into the impact of major social and demographic variables which have been understudied, e.g. social class, on psychological tendencies such as social orientation and cognitive habits, 2) these designs allow the researcher to better rule out third variables in exploring the

relationship among psychological tendencies that co-vary across cultural groups, 3) such approaches allow one to test whether the same within-culture variables have similar effects in different societies (or whether their effects are opposite, or confined to a single culture), 4) such approaches can allow for a test of the generalizability of previous cross-cultural findings within the broader populations of the societies in which these differences have been documented (for example, it may be that US-China differences in visual attention are confined to participants from middle-class backgrounds, or they may be present regardless of social class).

Recently cultural psychologists have begun to explore some of these within-culture differences, yielding several interesting findings. For example, Krauss and colleagues (2009) have shown that people from working-class backgrounds are less prone to the fundamental attribution error than those from middle-class backgrounds. In addition working-class people are quicker to engage in social mimicry (Krauss, Côté, & Keltner, 2010) suggesting that they are more socially attuned than middle-class participants. Working-class people show less preference for uniqueness when making choices (Stephens, et al., 2007) and show less cognitive dissonance when making choices for the self (Snibbe & Markus, 2005).

Another line of research has explored how the differences in the basis of local economic activity (hunting vs. cooperative fishing and farming) in neighboring Turkish villages has consequences for people's cognitive habits (Uskul, Kitayama, & Nisbett, 2008). Hunters, tend think more analytically than fisherman and farmers, categorizing objects more taxonomically, and showing more narrow patterns of visual attention (Uskul et al., 2008). Knight and Nisbett (2007) have also shown within-culture differences in

categorization, finding that Northern Italians categorize objects more taxonomically than Southern Italians. These studies and others suggest that within-culture factors like social class and whether economic activity is independent or cooperative may have similar effects to culture in terms of social orientation and analytic vs. holistic cognition. Taken together such studies also suggest that social orientation and cognitive habits tend to covary even when comparing groups that are similar in terms of language, genotype, and other factors which differ cross-culturally (for a review see Varnum, Grossmann, Kitayama, & Nisbett, 2010).

### Overview of the Present Work

Below, I will outline my attempt to explore how between- and within- culture differences have an impact on views of the self (and the behavioral consequences of those views) and on cognitive habits. I am using the format of a three-paper dissertation, in which each chapter consists of an article which has been published or is being prepared for publication.

The three papers that make up this dissertation all examine some aspect of social orientation, analytic vs. holistic cognition, or both. All three chapters focus on the psychological consequences of a within-culture variable. Chapters 1 and 2 examine social class; Chapter 3 explores regional variation in settlement history. The studies reported in chapters 1 and 3 also employ a mixture of within- and between-culture designs.

The goals of the present line of research are to 1) determine whether the within-culture factors being studied have an impact on social orientation and cognitive habits, and 2) to determine what the relationship is between these within-culture factors and between-culture differences in these domains and whether they operate through similar

mechanisms. The studies presented in Chapter 2 sought to assess whether a social class had a similar effect in an independent society and an interdependent society; they also sought to test whether the same mechanism might account for both within- and between-culture differences. The study presented in Chapter 3 sought to test whether social class differences in attribution were due differences in automatic inferences using an ERP paradigm. The studies presented in Chapter 4 explored whether differences in settlement history could account for both within- and between- culture differences in a behavioral expression of social orientation tendencies.

Chapter 2, which is a paper co-authored with Igor Grossmann presents two studies which explore the effect of social class and culture (American vs. Russian) on attribution, patterns of visual attention, and reasoning about change. Previous research has suggested that Russians are more interdependent than Americans (Matsumoto, et al., 1999), and that they have more contextual patterns of visual attention (Kühnen, et al., 2001). There is also some reason to believe that working-class people are more interdependent than middle-class people (Kraus, Côte, & Keltner, 2010; Na et al., 2010; Snibbe & Markus, 2005; Stephens, Markus, & Townsend, 2007) and more holistic (Krauss, Piff, & Keltner, 2009). The present paper extends those findings by using multiple dependent variables, and by simultaneously examining the effects of culture and class.

The first study attempted to replicate Kraus' (2009) finding that working-class people have more situational attribution tendencies, and extends that work by testing whether this relationship is true in both the US and Russia. The second study examined the effect of social class and culture on visual attention, reasoning about change and

symbolic self-inflation. In this study we also tested the social orientation hypothesis (Kitayama & Markus, 1991; Nisbett et al., 2001), which holds that group differences in analytic vs. holistic cognition are the result of group differences in independent vs. interdependent views of the self. In this study we explored the role of symbolic self-inflation as a mediator for both the cultural and social class effects which are observed.

In Chapter 3, a paper co-authored with Jinkyung Na and Shinobu Kitayama, we explored whether social class differences were present in spontaneous trait inference using Event Related Potentials (ERPs). A major goal of this study was to determine whether previously documented social class differences in attribution (Grossmann & Varnum, 2011; Kraus, Piff, & Keltner, 2009) might be due to differences in automatic processes. Recently, evidence has emerged to suggest that differences in attribution between European-Americans and Asians (and Asian-Americans) are likely due to differences in automatic inference processes rather than a later-stage motivated attempt to correct for initial dispositional bias (Na & Kitayama, in press). In this study we sought to address whether social class differences in attribution might also be due to automatic as opposed to controlled processes. This study also provides some insight into the “depth” of social class based differences in holistic vs. analytic cognitive habits.

Chapter 4, which is a paper co-authored with Shinobu Kitayama, examines the legacy of frontier settlement for contemporary regional differences. Previous research has found that residents of Hokkaido, which was more recently settled by ethnic Japanese than the other Japanese islands, are more independent than residents of the rest of Japan (Kitayama et al., 2006). These differences have been interpreted as supporting the voluntary settlement hypothesis (Kitayama et al., 2010), which holds that areas that were

more recently frontiers both select for and continue to reward and perpetuate more independent values, such as uniqueness and self-reliance. Recent evidence (Park et al., 2009) suggests that similar differences in values exist between the more recently settled parts of the US and regions with a longer history of settlement (such as New England).

In this paper, we explored the effect of voluntary settlement history on a behavioral measure of independent values – the choice of a relatively popular or unique name for one’s children. Studies 1 and 2 explored this relationship by comparing states the US that were more recently settled with older states, and making a similar comparison of Canadian provinces. Study 3, looks at the effect of settlement history on naming cross-nationally, comparing countries that were more recently frontiers (such as the US and Australia) with European countries. In Study 3, we also explored whether country-level independence, as measured by Hofstede and colleagues’ (2010) Individualism index, was correlated with naming practices.

Finally, Chapter 5 provides a summary of main findings of Chapters 2, 3, and 4, and attempts to integrate them. I then discuss some of the implications of this research for cultural psychology and psychology in general. I also explore some of the more practical implications of these findings for educational settings, advertising, and public service appeals. The chapter concludes with a discussion of future research directions that build upon the present work.



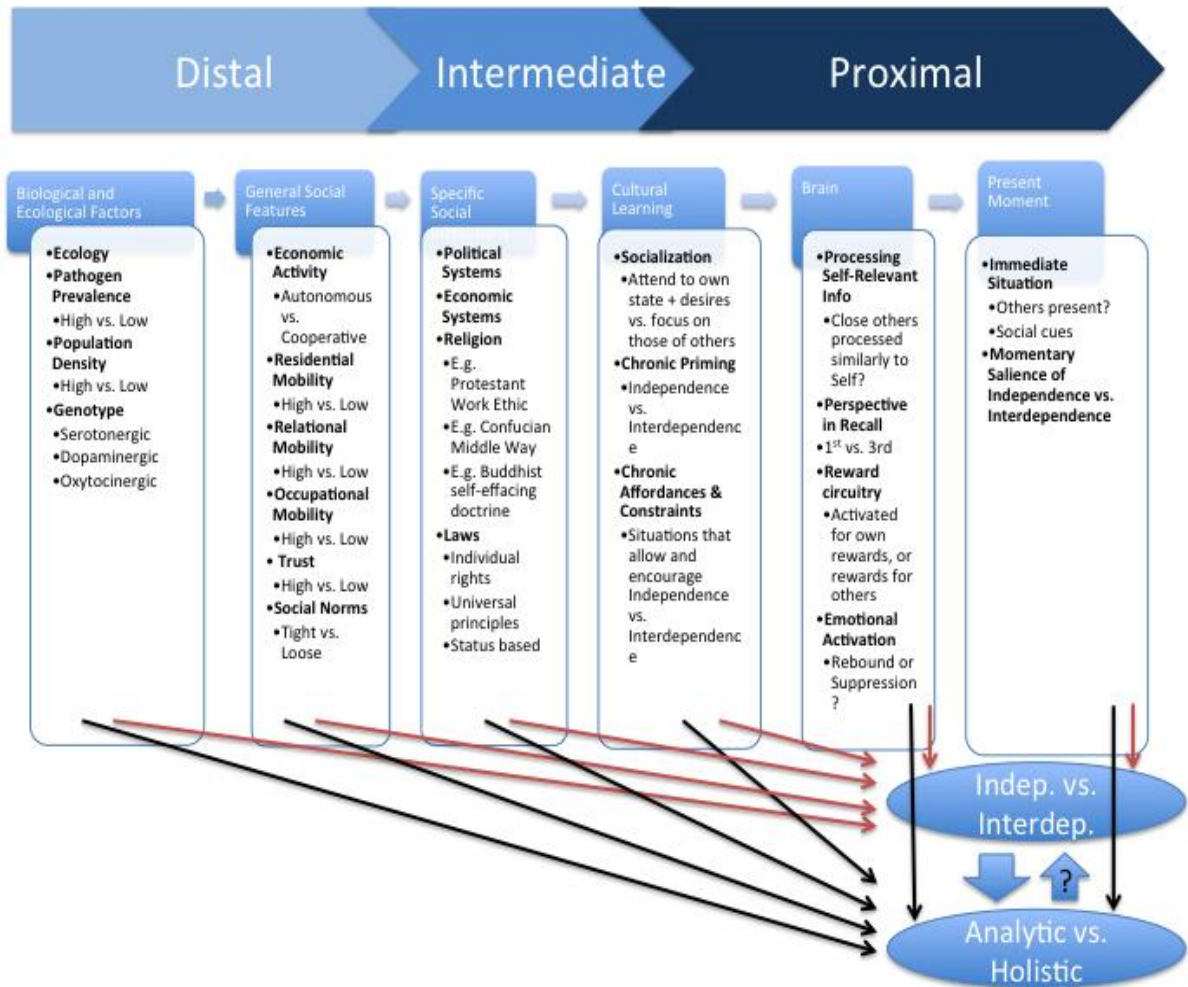
Table 1.1. Components of Social Orientation, adapted from Varnum et al., 2010

	<b>Independent Social Orientation</b>	<b>Interdependent Social Orientation</b>
<i>Values &amp; Beliefs</i>	Individualism Autonomy	Collectivism Harmony
<i>Self</i>	Independent Self-Construal Personal social identity Self as bounded Personality is constant across situations	Interdependent Self-Construal Relational social identity Self as overlapping with close others Personality varies across situations
<i>Emotions</i>	Higher propensity of socially disengaging emotions Happiness as a disengaging emotion	Higher propensity of socially engaging emotions Happiness as an engaging emotion
<i>Motivation</i>	Individual Achievement Self-enhancement Ego-inflation	Achievement for in-group Self-criticism Self-other interconnection

Table 1.2. Components of Analytic vs. Holistic Cognition, adapted from Varnum et al., 2010

	<b>Analytic Cognition</b>	<b>Holistic Cognition</b>
<i>Attention</i>	Field Independent Narrow Focus on salient objects with intent to manipulate them	Field Dependent Broad Focus on relationship of elements, background
<i>Categorization</i>	Taxonomic, focus on a single dimension or shared property	Thematic, focus on functional relationship or overall similarity
<i>Attribution</i>	Dispositional Traits and attributes of individuals determine events	Situational External forces, context, & situations determine events
<i>Reasoning</i>	Analytic Use of formal logic Trends continue	Dialectical Middle way philosophy Trend reversals are likely

Figure 1.1. Model of Origin and Maintenance of Cultural Differences



## References

- Bond, R., & Smith, P. B. (1996). Culture and conformity: A meta-analysis of studies using Asch's (1952b, 1956) line judgment task. *Psychological Bulletin*, *119*, 111-137.
- Bornstein, M.H., Toda, S., Azuma, H., Tamis-LaMonda, C., & Ogino, M. (1990). Mother and infant activity and interaction in Japan and in the United States: II. A comparative microanalysis of naturalistic exchanges focused on the organization of infant attention. *International Journal of Behavioral Development*, *13*, 289-308.
- Chao, J.Y., & Blizinsky, K.D. (2010). Culture-gene coevolution of individualism-collectivism and the serotonin transporter gene. *Proceedings of The Royal Society, B: Biological Sciences*, *22*, 529-537.
- Chiao, J. Y., Harada, T., Komeda, H., Li, Z., Mano, Y., Saito, D. N., Parrish, T. B., Sadato, N. & Iidaka, T. (2009). Neural basis of individualistic and collectivistic views of self. *Human Brain*, *30*, 2813–2820.
- Chiao, J. Y., Harada, T., Komeda, H., Li, Z., Mano, Y., Saito, D. N., Parrish, T. B., Sadato, N. & Iidaka, T. (2010) Dynamic cultural influences on neural representations of the self. *Journal of Cognitive Neuroscience*, *22*, 1–11.
- Choi, I., & Nisbett, R. E. (1998). Situational salience and cultural differences in the correspondence bias and actor-observer bias. *Personality and Social Psychology Bulletin*, *24*, 949-960.
- Colzato, L.S., van Beest, I., van den Wildenberg, W.P.M., Scorolli, C., Dorchin, S., Meiran, N., Borghi, A.M., & Hommel, B. (2010). God: Do I have your attention? *Cognition*, *117*, 87-94.
- Cohen, A.B., Li, J.Y., & Johnson, K.A. (2011). Fundamental(ist) attribution error: Protestants are dispositionally focused. Paper presented at the 12<sup>th</sup> annual meeting of the Society for Personality and Social Psychology. San Antonio, TX.
- Cohen, D., Hoshino-Browne, E., Leung, A.k-y. (2007). Culture and the structure of personal experience: Insider and outsider phenomenologies of the self. *Advances in Experimental Psychology*, *39*, 1-67.
- Cohen D., Nisbett R.E., Bowdle, B.F., Schwarz, N. (1996). Insult, aggression, and the Southern culture of honor: An “experimental ethnography.” *Journal of Personality and Social Psychology*, *70*, 945–60.
- Diener, E., Diener, M., Diener, C. (1995). Factors predicting the subjective well-being of nations, *Journal of Personality and Social Psychology* *69*, 851–864.
- Grossmann, I., & Kross, E. (2010). The impact of culture on adaptive vs. maladaptive self-reflection. *Psychological Science*, *21*, 1150-1157.
- Grossmann, I., & Varnum, M.E.W. (2011). Social class, culture, and cognition. *Social Psychological and Personality Science*, 81-89.
- Han, S., Northoff, G. (2009). Understanding the self: A cultural neuroscience approach. *Progress in Brain Research*, *178*, 203-212.
- Henrich, J., Ensimger, J., McElreath, R., Barr, A., Barrett, C., Bolyanatz, A., Cardenas, J. C., Gurven, M., Gwako, E., Henrich, N., Lesorogol, C., Marlowe, F., Tracer, D., Ziker, J. (2010). Markets, religion, community size, and the evolution of fairness and punishment. *Science*, *327*, 1480-1484.

- Henrich, J., Heine, S. & Norenzayan, A. (2010) The Weirdest People in the World? *Behavioral and Brain Sciences*, 33, 61-135.
- Henrich, J., McElreath, R., Barr, A., Ensminger, J., Barrett, C., Bolyanatz, A., Cardenas, J.C., Gurven, M., Gwako, E., Henrich, N., Lesorogol, C., Marlowe, F., Tracer, D., Ziker, J. (2006). Costly punishment across human societies. *Science*, 312: 1767- 1770
- Hoshino-Browne, E., Zanna, A. S., Spencer, S. J., Zanna, M. P., Kitayama, S., & Lackenbauer, S. (2005). On the cultural guises of cognitive dissonance: The case of Easterners and Westerners. *Journal of Personality and Social Psychology*, 89, 294-310.
- Hofstede, G., Hofstede, J.H., & Minkov, M. (2010). *Cultures and organizations: Software of the mind* (3rd ed.). New York, NY: McGraw-Hill.
- Imada, T., & Kitayama, S. (2010). Social eyes and choice justification: Culture and dissonance revisited. *Social Cognition*, 28, 589-608.
- Kim, H.S., Sherman, D.K., & Taylor, S.E. (2008). Culture and social support. *American Psychologist*, 63, 518-526.
- Kim, H.S., Sherman, D.K., Taylor, S.E., Sasaki, J.Y., Chu, T.Q., Ryu, C., Suh, E.M., & Xu, J. (2010). Culture serotonin receptor polymorphism and locus of attention. *Social Cognitive and Affective Neuroscience*, 5, 212-218.
- Kitayama, S., Conway, J. G., Pietromonaco, P.B., Park, H., & Plaut, V.C. (2010). Ethos of independence across regions of the United States: The production-adoption model of cultural change. *American Psychologist*, 65, 559-574.
- Kitayama, S., Ishii, K., Imada, T., Takemura, K., & Ramaswamy, J. (2006). Voluntary settlement and the spirit of independence: Evidence from Japan's "Northern frontier." *Journal of Personality and Social Psychology*, 91, 369-384.
- Kitayama, S., Markus, H. R., Matsumoto, H., Norasakkunkit, V. (1997). Individual and collective processes in the construction of the self: Self-enhancement in the United States and self-criticism in Japan. *Journal of Personality and Social Psychology*, 72, 1245-1267.
- Kitayama, S., Mesquita, B., & Karasawa, M. (2006). Cultural affordances and emotional experience: Socially engaging and disengaging emotions in Japan and the United States. *Journal of Personality and Social Psychology*, 91, 890-903.
- Kitayama, S., & Uskul, A.K. (2010). Culture, mind, and the brain: Current evidence and future directions. *Annual Review of Psychology*, 62, 419-449.
- Knight, K.N., & Nisbett, R.E. (2007). Culture, class, and cognition: Evidence from Italy. *Journal of Cognition and Culture*, 7, 283-291.
- Kühnen, U., Hannover, B., Roeder, U. R., Shah, A. A., Schubert, B., Upmeyer, A., & Zakaria, S. (2001). Cross-cultural variations in identifying embedded figures: Comparisons from the United States, Germany, Russia, and Malaysia. *Journal of Cross-Cultural Psychology*, 32, 365-371.
- Kraus, M.W., Côté, S., & Keltner, D. (2010). Social class, contextualism, and empathic accuracy. *Psychological Science*, 21, 1716-1723.
- Kraus, M.W., Piff, P. K., & Keltner, D. (2009). Social class, sense of control, and social explanation. *Journal of Personality and Social Psychology*, 97, 992-1004
- Marlowe, F.W., Berbesque, J. C., Barr, A., Barrett, C., Bolyanatz, A., Cardenas, J.C., Ensminger, J., Gurven, M., Gwako, E., Henrich, J., Henrich, N., Lesorogol, C.,

- McElreath, R., Tracer, D. (2008) More 'altruistic' punishment in larger societies. *Proceedings of the Royal Academy*, 275, 587-590
- Markus, H.R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224–253.
- Masuda, T., Ellsworth, P., Mesquita, B., Leu, J., Tanida, S., & Van de Veerdonk, E. (2008). Placing the face in context: Cultural differences in the perception of facial emotion. *Journal of Personality and Social Psychology*, 94, 365-381.
- Masuda, T., & Kitayama, S. (2004). Perceiver-induced constraint and attitude attribution in Japan and the US: A case for culture-dependence of correspondence bias. *Journal of Experimental Social Psychology*, 40, 409-416.
- Na, J., Grossmann, I., Varnum, M.E.W., Kitayama, S., Gonzalez, R., & Nisbett, R.E. (2010). Cultural differences are not always reducible to individual differences. *Proceedings of the National Academy of Sciences of the USA*, 107, 6192-6197.
- Na, J., & Kitayama, S. (in press). Spontaneous trait inference is culture specific: Behavioral and neural evidence. *Psychological Science*.
- Nisbett, R.E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: Holistic vs. analytic cognition. *Psychological Review*, 108, 291–310.
- Nisbett, R. E. (2003). *The geography of thought: How Asians and Westerners think differently... and why*. New York: The Free Press.
- Oishi, S., Lun, J., & Sherman, G.D. (2007). Residential mobility, self-concept, and positive affect in social interactions. *Journal of Personality and Social Psychology*, 93, 831–844.
- Oyserman, D., & Lee, S. (2008). Does culture influence what and how we think? Effects of priming individualism and collectivism. *Psychological Bulletin*, 134, 311–342.
- Oyserman, D., Sorenson, N., Reber, R., & Chen, S.X. (2009). Connecting and separating mind-sets: Culture as situated cognition. *Journal of Personality and Social Psychology*, 97, 217-235.
- Park, H., Conway, L.G., Pietromonaco, P.R., Plaut, V.C., & Kitayama, S. (2009). *A paradox of American individualism: Regions vary in explicit, but not implicit, independence*. Unpublished manuscript, Hokkaido University, Hokkaido, Japan.
- Roberson, D., Davies, I., & Davidoff, J. (2000). Color categories are not universal: Replications and new evidence from a stone-age culture. *Journal of Experimental Psychology: General*, 129, 369–398.
- Sanchez-Burks, J. (2002) Protestant Relational Ideology and (in) attention to relational cues in work settings. *Journal of Personality and Social Psychology*, 83, 919-929.
- Segall, M., Campbell, D., & Herskovits, M. J. (1966). *The influence of culture on visual perception*. New York: Bobbs-Merrill.
- Snibbe, A. C., & Markus, H. R. (2005). You can't always get what you want: Educational attainment, agency, and choice. *Journal of Personality and Social Psychology*, 88, 703-720.
- Stephens, N. M., Markus, H. R., & Townsend, S. S. (2007). Choice as an act of meaning: The case of social class. *Journal of Personality and Social Psychology*, 93, 814-830.
- Tönnies, F. (2002). *Community and Society* (C.P. Loomis, Trans.). New York: Dover. (Original work published 1887).

- Tsai, J.L. (2007). Ideal affect: Cultural causes and behavioral consequences. *Perspectives on Psychological Science*, 2, 242-259.
- Uskul, A.K., Kitayama, S., & Nisbett, R.E. (2008). Ecocultural basis of cognition: Farmers and fishermen are more holistic than herders. *Proceedings of the National Academy of Sciences of the USA*, 105, 8552–8556.
- Varnum, M.E.W., Grossmann, I., Kitayama, S., & Nisbett, R.E. (2010). The origin of cultural differences in cognition: The social orientation hypothesis. *Current Directions in Psychological Science*, 19, 9-13.
- Zhu, Y., Zhang, Li., Fan, J., Han, S. (2007). Neural basis of cultural influence on self representation. *Neuroimage*, 34, 1310-1317.

## Chapter 2:

### Social Class, Culture, and Cognition

Social class has been present in nearly every society and has been a central topic in the social sciences for centuries (e.g., Durkheim, 1893/1933; Marx, 1956). It has been associated with a broad range of consequences, including differences in aesthetic preferences (Bourdieu, 1984; Snibbe & Markus, 2005), child-rearing practices (Kohn & Schooler, 1969), health (Gallo, Monteros, & Shivpuri, 2009), and subjective well-being (Diener, Oishi, & Lucas, 2003). And yet only recently have psychologists begun to explore whether and how social class influences the ways in which people perceive and construe their world (Argyle, 1994).

Many social scientists hold that people of higher social class status dictate and exemplify the cultural practices of a society as a whole (Bourdieu & Passeron, 1977; Gramsci & Rosengarten, 1994). Thus, one would also suspect that the cognitive tendencies of people of higher social class status would be more culturally typical.<sup>1</sup> This interactive hypothesis of cultural transmission implies that the relationship between social class and cognitive tendencies will differ in societies that vary in their overall endorsement of those tendencies. An alternative additive hypothesis suggests that social-class-related environments promote differences in practices and values (Kohn & Schooler, 1983), which in turn may foster different cognitive tendencies. According to this hypothesis, social class will have the same effect on cognitive tendencies regardless of cultural differences in the overall endorsement of those tendencies. In the studies



reported here, we examined whether social class is differentially associated with holistic versus analytic cognition in independently oriented and interdependently oriented cultures. In addition, we explored a common psychological mechanism underlying sociocultural differences in cognition.

### Cultural Hegemony Versus Self-Direction

Philosophers, political scientists, and sociologists have suggested that people with higher social class status dictate the normative way of being and thinking in a given culture. For instance, the influential theory of cultural hegemony proposed by Gramsci suggests that the ideas and practices of the middle-class are seen by the working-class as general cultural norms, thus maintaining the existing social order (Gramsci & Rosengarten, 1994). A similar argument has been made by Bourdieu in *La Reproduction* (Bourdieu, 1984; Bourdieu & Passeron, 1977), where he suggests that cultural institutions such as education are used by the upper classes as a means of affirming and transmitting their practices, beliefs, and cognitive tendencies as those of the dominant culture. Ethnographic reports also suggest that some working-class children engage in countercultural behaviors to oppose the behaviors and norms associated with the middle-class (Willis, 1981), despite the high value of conformity among working-class adults (Kohn, 1969). These observations suggest an interactive hypothesis regarding social class and cognition: The cognitive tendencies of higher class people exemplify those of a society more so than the cognitive tendencies of lower class people.

An alternative additive hypothesis can be derived from the Marxist idea that control over the means of production and associated environmental affordances (e.g., working conditions) promote social class differences in cognitive style. Among others,

Kohn, Schooler, and colleagues (e.g., Kohn & Schooler, 1983; Schooler, Samuel, & Oates, 2004) proposed that differences in people's occupations are the cause of social class differences in beliefs and practices (e.g., child-rearing practices) associated with self-direction. In a series of studies, those researchers found that higher class jobs facilitate occupational self-direction and promote a self-directed orientation (Kohn & Schooler, 1983). More importantly, researchers have replicated the effect of social class on values observed in the United States in a series of surveys in Japan, Ukraine, Poland, and Russia (Kohn et al., 1997; Kohn, Naoi, Schoenbach, Schooler, & Slomczynski, 1990; Tudge, Hogan, Snezhkova, Kulakova, & Etz, 2000), suggesting that the effects of social class on cognitive tendencies may also be universal across different societies.

#### Cultures and Analytic Versus Holistic Cognition

A revival in cultural psychological research has occurred in the past two decades (Heine, 2008). During this period, a heavy emphasis has been placed on two constructs: cognitive style and views of the self. Some countries, such as the United States, are characterized by analytic cognition: detaching a focal object from the perceptual field, predicting linear development of events, and ascribing causality to focal actors or objects. In contrast, other countries including China, Japan, and Korea are holistic, emphasizing paying attention to the entire perceptual field, especially relations among objects and events, predicting nonlinear development of events, and attributing causality to context (Nisbett, Peng, Choi, & Norenzayan, 2001). The ecological validity of these differences has been supported by cross-cultural analyses of cultural products such as newspapers, art, and advertisements (Masuda, Gonzalez, Kwan, & Nisbett, 2008).

Similarly, countries also differ in terms of their emphasis on self-direction as well as in their tendencies to endorse different views of the self. Some countries value independence: emphasizing uniqueness, possessing relatively low sensitivity to social cues, and encouraging self-directed behaviors that affirm autonomy. Other countries value interdependence, emphasizing harmonious relations with others, promoting sensitivity to social cues, and encouraging behaviors that affirm relatedness to others (Kitayama, Duffy, & Uchida, 2007). These cultural differences in views of the self have also been linked to differences in cognitive styles. A large body of evidence shows that interdependently oriented societies such as Japan, China, or Russia are more holistic in terms of cognitive style, whereas independently oriented societies such as Germany and the United States are more analytic (Markus & Kitayama, 1991; Nisbett et al., 2001; also see Varnum, Grossmann, Kitayama, & Nisbett, 2010, for a review).

It is worth noting that a self-directed orientation is part of the conceptualization of independent versus interdependent notions of the self (e.g., Markus & Kitayama, 1991). Consistent with research on social class effects on self-direction, psychologists have found that among North Americans higher social class status is associated with a preference for resisting influence and expressing uniqueness (Stephens, Markus, & Townsend, 2007) and lower levels of social mimicry (Kraus & Keltner, 2009)—all indications that higher social class is positively linked to independence. These findings, combined with the observation that self-views are associated with cognitive style (Varnum et al., 2010), suggest that working-class people are likely to be more holistic than middle-class people. In support of this claim, Kraus and colleagues found that

working-class Americans favor contextual explanations for social events (Kraus, Piff, & Keltner, 2009).

Building on previous research on social class and culture, in the present research we tested interactive versus additive accounts of the relationship between social class and cognitive style. According to the interactive hypothesis, one would expect the middle-class to be more analytic than the working-class in predominantly analytic cultural contexts and more holistic than the working-class in cultural contexts where holistic thinking is more predominant. Alternatively, the additive hypothesis suggests that the middle-class is more analytic than the working-class above and beyond the effect of country because of social structural differences in environmental affordances linked to independent versus interdependent views of the self.

#### Overview of the Present Research

We examined analytic or holistic cognition with a sample in which both country and social class varied simultaneously. We selected the United States as it is a Western, independently oriented society where analytic thinking is predominant (Nisbett et al., 2001). We selected Russia as it is an interdependently oriented society where holistic thinking is predominant (Grossmann & Kross, 2010; Kühnen et al., 2001).<sup>2</sup> Also, both Russian and American societies have been the focus of previous research on the relationship between social class and self-direction (e.g., Tudge et al., 2000). In Study 1, we examined class and country effects on dispositional bias. In Study 2, we addressed whether social class effects exist in other cognitive domains (visual attention and linear vs. nonlinear reasoning about change). In addition, we wanted to examine differences in

self-views as a mechanism that mediates country and social class effects on cognition (Study 2).

### Study 1

Study 1 sought to provide an initial test of the interactive and additive hypotheses, examining the effects of social class on cognition in the domain of social inference. This study was both a conceptual replication of previous work on social class and dispositional attribution (Kraus et al., 2009) and an extension of this work as it simultaneously examined cross-country differences in the same domain. Based on previous findings that Russians are more holistic than Westerners (Grossmann & Kross, 2010; Kuhnen et al., 2001), we hypothesized that Russians would make less dispositional attributions for others' behavior. The interactive hypothesis predicted that country would moderate social class effects on attribution, whereas the additive hypothesis predicted that social class effects would be independent of the effect of country such that lower social class would be associated with less dispositional bias.

### Methods

Participants. In exchange for course credit, 62 American students from the University of Michigan (34 females;  $M$  age 18.71 years,  $SD$  age 0.86; all European Americans) and 60 Moscow State Regional University students (43 females;  $M$  age 19.02,  $SD$  age 1.35; 95% Russian, 5% other ethnicities) participated in the study. Moscow State Regional University is one of the top 20 Russian universities with students coming from the larger Moscow region.

Procedure and materials. Participants completed the study on their own, guided by written instructions that informed them that the purpose of the study was to explore

“personality differences in personal perception.”<sup>3</sup> Participants read two vignettes, which described a protagonist who performed either a desirable or an undesirable action (Kitayama, Ishii, Imada, Takemura, & Ramaswamy, 2006, Study 3; see Appendix A for an example). After reading each vignette, participants answered two questions indicating (a) the extent to which “features of the protagonist such as his/her character, attitude, or temperament influenced his/her behavior” (dispositional attribution score) and (b) the extent to which “features of the environment that surround the protagonist such as the atmosphere, social norms, or other contextual factors influenced his/her behavior” (situational attribution score; 1 = strongly disagree, 7 = strongly agree).

Social class. Educational attainment has been proposed as the key factor that distinguishes different classes (e.g., Ehrenreich, 1989; Lareau, 2003; Willis, 1981).<sup>4</sup> Therefore, at the end of the study, participants indicated their parents’ educational attainment (1 = high school, 2 = some college, 3 = completed college, 4 = postgraduate). The higher score in the family was used as an indicator of social class (Russia:  $M = 2.13$ ,  $SD = 0.89$ ; United States:  $M = 2.48$ ,  $SD = 0.65$ ).

## Results

Preliminary analyses indicated that the groups in each country were matched on age,  $t(120) = 1.51$ , ns, and gender ( $\chi^2 = 3.32$ , ns). Neither age nor gender interacted with social class, age  $F(1, 120) = 1.09$ , ns; gender  $F(1, 120) = 0.01$ , ns, and controlling for these variables did not influence any of the results. Thus, they are not discussed further.

We performed a general linear model on the attribution scores (dispositional vs. situational) with country (Russia =  $-0.5$  vs. the United States =  $0.5$ ) and social class as between-subject factors and story type (negative vs. positive) as a within-subject factor.

There were no main effects of country or story type ( $F_s < 1$ ; see Table 2.1 for descriptives and zero-order correlations). We observed a significant country (Russia vs. the United States) X attribution score (dispositional vs. situational) interaction,  $F(1, 119) = 7.24, p < .01$ , with Russians showing less dispositional bias than Americans. Subsequent analyses conducted separately for dispositional and situational scores indicated that the interaction was driven by a significant effect of country on dispositional scores,  $F(1, 119) = 12.64, p = .001$ , with Russians making less dispositional attributions than Americans. The effect of country on situational attribution scores was not significant ( $F < 1$ ).

In the next step, we examined the effects of social class. The social class X attribution score (dispositional vs. situational) interaction was significant,  $F(1, 119) = 3.79, p = .05$ , (see Figures 2.1 and 2.2), with lower social class being associated with lower dispositional and higher situational scores than higher social class above and beyond the effect of country. Neither the country social class interaction nor any other interaction was significant (all  $F_s < 1$ ).

## Study 2

Study 1 provided initial support for the additive hypothesis. In Study 2, we examined whether and how social class affects other aspects of holistic thinking. We sought to address this question by examining holistic versus analytic tendencies in visual attention and reasoning about change.

Another question we addressed in Study 2 concerns the psychological mechanisms that mediate cultural and social class differences in cognitive style. Specifically, in line with previous cultural psychological theories about the social origin of cognitive styles (e.g., Markus & Kitayama, 1991; Varnum et al., 2010), we

hypothesized that independent versus interdependent self-views drive differences in analytic versus holistic cognition. Members of societies in which independent self-views are more common should be motivated to symbolically inflate representations of their personal self at the expense of others. Indeed, self-inflation is more common in more independent countries (e.g., the United States) than in more interdependent countries (e.g., Japan; Duffy, Uchida, & Kitayama, 2008; Kitayama, Park, Sevincer, Karasawa, & Uskul, 2009). The second goal of Study 2 was to provide a formal test of this mediation hypothesis by simultaneously assessing cultural and social class differences in independent versus interdependent self-views and how these self-views relate to differences in cognition.

#### Method

Participants. In return for \$12 (Michigan) or 350 rubles (Moscow, approximately \$11), 53 University of Michigan students (36 female;  $M_{age} = 19.54$ ,  $SD = 1.33$ ; 92.0% European Americans, 2.0% African Americans, 6.0% other ethnicities) and 61 Moscow City University of Education and Psychology students (46 female;  $M_{age} = 20.05$ ,  $SD = 2.94$ ; 93.2% Russians, 6.8% other ethnicities) participated in the study.

Procedure. Participants completed the study on their own, guided by written instructions, which informed them that this study explored social relationships and cognition and invited them to participate in the attention task.

#### Dependent Variables

Visual attention. Following Masuda and Nisbett (2006), participants watched three pairs of 20-s animated scenes (e.g., a construction site and an airport, each of them presented four times) on a technically identical 15 in. monitor, which included three to four focal



objects (moving or fixed in the foreground or middle-range area; e.g., aircraft) and several background objects (e.g., ground, sky, buildings). Each scene pair consisted of two similar but slightly different vignettes, and the participants' job was to detect the differences between them. Participants recorded changes between the first and second version. Two hypothesis-blind Russian–English bilinguals coded each sentence for reference to one of the two categories of change (focal vs. context). Inter-rater reliability was high (93% agreement, with disagreements decided by the first author). The number of changes to focal objects and to the context that participants noticed was counted and averaged across the four sets of scenes. Following Masuda and Nisbett (2006), focal change scores were subtracted from context change scores ( $r$  [difference scores] = .29) and collapsed to form a single index.

Prediction of change. Participants were presented with eight graphs, each showing a trend (e.g., economic growth; for materials, see Ji, Nisbett, & Su, 2001), and indicated the next two points on each graph. We measured the vertical distance (number of cells on the grid) between the baseline in “2004” and the prediction in “2008.” These scores were multiplied by “-1” and averaged to form a single index of nonlinear reasoning ( $r > .42$ ).

Symbolic representation of self and friends (self-inflation). Self-inflation has been previously conceptualized as a “habitual, automatic, and thus implicit” tendency associated with independent and interdependent views of the self (Kitayama et al., 2009, p. 242). In our study, participants drew diagrams of their social networks (for verbatim instructions, see Duffy et al., 2008) using ovals to represent people. Two hypothesis-blind coders measured the diameter of each oval at its largest point ( $r = .95$ ; coders' scores were averaged). A self-representation ratio was obtained by dividing the size of the

average friend- circle by the size of the self-circle. Previous research indicates that people in independent countries (e.g., the United States) count more people as part of their social network than people in interdependent countries (e.g., Japan; Fiori, Antonucci, & Akiyama, 2008). Because the space in which to draw the diagram is limited, including more friends may by necessity reduce the size of the “friend-circles.” To control for this potential artifact, we adjusted the self-inflation scores for the number of friends in the network. Another potential artifact is that individuals may differ in the size of the circles they draw in general. To control for this, we opted to calculate self-inflation as a ratio rather than a difference score. We took this adjusted score as an indicator of how interdependent a participant’s self-views were, with higher scores indicating greater importance placed on close others relative to the self.

Social class. Social class was measured using the procedure from Study 1 (Russia:  $M = 2.89$ ,  $SD = 0.55$ ; United States:  $M = 3.36$ ,  $SD = 0.90$ ).

## Results

Cultural groups were matched on age,  $t(112) = 1.52$ , ns, and gender ( $\chi^2 = 0.86$ , ns). Neither age nor gender interacted with social class, age  $F(1, 112) = 0.15$ , ns; gender  $F(1, 112) = 0.01$ , ns, and controlling for these variables did not influence any of the results. Thus, they are not discussed further.

For each of the three dependent variables, we ran a regression with country (Russia =  $-0.5$  vs. the United States =  $0.5$ ) and social class as predictors (see Table 2 for descriptive statistics and zero-order correlations). Country had a significant effect on each of the cognitive variables in the predicted direction (attention:  $\beta = .49$ ,  $p < .001$ ; prediction of change:  $\beta = .47$ ,  $p < .001$ ). As shown in Table 2.2, Russians paid more

attention to context and made more nonlinear predictions about change. Consistent with previous cross-cultural research on independent versus interdependent views of the self in Russia (e.g., Realo & Allik, 1999), Russians also showed less self-inflation than Americans, as indicated by the ratio of the size of friend-circles to the self-circle on their social network diagrams ( $\beta = .48, p < .001$ ).

We next examined the effects of social class on these variables. Consistent with the results of Study 1, lower social class was positively associated with contextual attention and non-linear change prediction indicating more holistic cognitive tendencies ( $\beta = .20, p = .03$  and  $\beta = -.17, p = .06$ , respectively). In addition, lower social class was positively associated with larger friend-to-self ratios ( $\beta = .32, p < .001$ ), suggesting a more interdependent self-view. The country X class interaction did not have a significant effect on any of the dependent variables (all  $\beta$ s  $< .10$ , ns).

We subsequently examined whether self-inflation mediates the relationship between social class and each of the cognitive variables assessed in this study by performing a series of multiple regression analyses. As Figure 2.3 illustrates, in each case the conditions for establishing mediation according to Shrout and Bolger (2002) were met. Specifically, social class was related to self-inflation, and each of these variables was related to each of the outcome variables assessed in this study. Importantly, the results of a bootstrapping test, the technique of choice for assessing mediation in small samples (Preacher & Hayes, 2004; Shrout & Bolger, 2002), indicated that controlling for self-inflation significantly attenuated the relationship between social class and attention as well as the relationship between social class and prediction of change. Moreover, a mediation analysis with country (Russia vs. the United States) as a predictor

also indicated that controlling for self-inflation significantly attenuated the relationship between country and each of the cognitive variables (see Figures 2.3 and 2.4 for 95% confidence intervals generated by the bootstrapping test for each mediation analysis). Sobel tests confirmed the bootstrapping test results, indicating that social class effects were mediated by self-inflation (attention: Sobel = 1.71,  $p = .08$ ; nonlinear reasoning: Sobel = 3.33,  $p < .001$ ) as were country effects (attention: Sobel = 3.65,  $p < .001$ ; nonlinear reasoning: Sobel = 2.96,  $p = .003$ ).

Using structural equation modeling, we compared how well the model in which self-inflation mediates the social class–cognition (attention and nonlinear reasoning) link (Model 1) fit the data against a model in which cognitive tendencies mediate the social class–self-inflation link (Model 2). The results indicated that Model 1 fit the data well (comparative fit index [CFI]  $\geq 1$ , root mean square error of approximation [RMSEA]  $\leq .001$ ,  $\chi^2 \leq .83$ ,  $p \leq .36$ ), whereas Model 2 fit the data poorly (CFI  $\leq .98$ , RMSEA  $\leq .09$ ,  $\chi^2 \leq 8.91$ ,  $p \leq .003$ ).

### General Discussion

In two studies, we found evidence that social class and country have independent effects on cognition. We found that people from lower social class backgrounds were more holistic than those from higher social class backgrounds, and we found that Russians were more holistic than Americans with regard to contextual versus dispositional attribution, holistic processing of visual information, and prediction of nonlinear versus linear development of events. We also found that people from lower social class backgrounds and Russians endorse more interdependent self-views than do people from higher social class backgrounds and Americans. Furthermore, these

differences in self-views partially mediated the group differences in cognition that we observed.

Our research extends previous findings on the influence social class has on how people construe the world in three ways. First, the present results show that the effects of social class are not limited to social inference but can also be observed in nonsocial domains such as visual perception and prediction of change. Second, the effects of social class have been replicated in a non-Western interdependent society. These findings suggest that the interactive view of social class and culture needs to be seriously reconsidered. It appears that, at least with regard to cognitive style, people from higher social class backgrounds do not dictate and exemplify the cognitive tendencies of society as a whole. Instead, and consistent with previous theories that social class differences in environmental affordances lead to differences in self-direction (e.g., Schooler, 2007), the present research supports an additive account of social class and cultural differences in cognition.

Finally, we were able to identify a common mechanism that accounted for both social class and cross-national differences in cognition. These insights about the relationship among sociocultural environments, self-views, and cognition have both practical and theoretical implications. For instance, recent studies suggest that taking a broader, more holistic perspective can be adaptive when reflecting on negative events (Grossmann & Kross, 2010). Taken together with our current findings, this suggests that social classes may also differ in their patterns of emotion regulation. Future research should explore the relationship between class differences in cognitive style and emotion

regulation as well as its impact on health- and mood-related vulnerabilities (Adler et al., 1994).

Several caveats are in order. The meditation analyses reported in this article are based on cross-sectional, correlational data, thus limiting causal inference. Longitudinal and experimental research is thus needed to more closely examine the causal nature of the relationships suggested by the mediation analyses reported in Study 2. In addition, it is worth noting that we used self-inflation as a measure of independent versus interdependent self-views in our research. At this point, it is an empirical question whether other measures of independence–interdependence also mediate the effect of culture and social class on cognitive tendencies. Previous work on social class suggests that it shapes many aspects of our social lives and experiences. The present research adds to this literature by showing that even basic nonsocial perception is colored by social class and that these class-related differences in cognitive style are linked to viewing the self as interdependent. Understanding that social class affects how people perceive and reason about the social and nonsocial world may have implications for fields such as marketing and politics as well as educational and therapeutic settings involving people of differing socioeconomic status. For example, people from lower social class backgrounds may be at a disadvantage in academic settings that reward analytical reasoning and perception. School curricula might be modified or interventions could be designed to address this disparity. Therapists may also benefit from the knowledge that working-class clients may be more likely to locate causality in the situation rather than the individual and that this pattern may reflect differences in sociocultural norms as opposed to maladaptive cognitions

## Footnotes

1. In line with theory in cultural psychology and cognitive development (e.g., Markus & Kitayama, 1991; Nisbett, Peng, Choi, & Norenzayan, 2001; Saxe, 1999), we use Vygotsky's (1978) theoretical framework proposing tight links between cultural practices and cognition.
2. Previous cross-cultural behavioral and survey research has consistently documented that Russians are more interdependent than people in the Western societies. For instance, Naumov (1996) showed that Russians have higher scores on Hofstede's value dimensions related to interdependence than Germans. Similarly, Matsumoto, Takeuchi, Andayani, Kouznetsova, and Krupp (1998) conducted a multicountry comparison of individualistic versus collectivistic beliefs and behavioral tendencies, which indicated that Russians had significantly higher collectivism scores than Americans. Finally, Realo and Allik (1999) used the Twenty Statement Test to examine the relational versus independent self-descriptions among Russian, Estonian, and American college students. Their results indicated a significantly larger percentage of relational self-descriptions among Russians than among Estonians, or Americans.
3. All materials in this article were back translated from English into Russian (Brislin, 1970) and presented in Russian to the Russian samples.

4. Consistent with sociological theory, education has been found to explain twice as much variance in occupational prestige as income and to be more closely related to other socioeconomic indicators (Oakes & Rossi, 2003). Therefore, and in line with theory and empirical work on social stratification (Ehrenreich, 1989; Gilbert, 2008), we sought to capture class differences on a continuum: working-class (high school)–lower middle-class (some college)– upper middle-class (completed college)–intelligentsia class (post-graduates). Preliminary analyses yielded comparable results in both studies whether analyzing social class as a continuous or as an ordinal-level variable.



Table 2.1. Descriptive Statistics and Zero-Order Correlations in Study 1

Variables	<i>M (SD)</i>		1.	2.	3.	4.
	Russia (n=60)	US (n=62)				
<b>Undesirable action</b>						
1. Dispositional attribution	4.33 (1.53)	5.63 (1.29)	--	-.38 <sup>***</sup>	.23 <sup>**</sup>	.13
2. Situational attribution	5.25 (1.42)	4.66 (1.49)		--	.18 <sup>*</sup>	.09
<b>Desirable action</b>						
3. Dispositional attribution	4.38 (1.81)	5.10 (1.65)			--	-.46 <sup>***</sup>
4. Situational attribution	5.18 (1.46)	5.16 (1.69)				--

Notes. †  $p \leq .1$ . \*  $p \leq .05$ . \*\*  $p \leq .01$ . \*\*\*  $p \leq .001$ .

Table 2.2. Descriptive Statistics and Correlations in Study 2.

Variables	<i>M (SD)</i>		Correlations		
	Russia (n=61)	US (n=50)	1.	2.	3.
1. Visual Attention	.28 (.68)	-.31 (.71)	-.24*	.18 <sup>†</sup>	.29**
2. Prediction of change	.43 (.84)	-.51 (.96)		-.17 <sup>†</sup>	.48***
3. Self-views	.49 (.75)	-.45 (.96)			-.35***

*Notes.* Zero-order correlations appear above the diagonal. *Partial Correlations* with social class appear on the diagonal. Higher numbers on all variables indicate relatively more holistic cognition and an interdependent view of the self. <sup>†</sup> $p \leq .1$ . \*  $p \leq .05$ . \*\*  $p \leq .01$ . \*\*\*  $p \leq .001$ .

Figure 2.1. Effects of social class (+1 SD of the mean) for dispositional and situational attributions in Study 1 for Russia (Panel A) and the United States (Panel B).

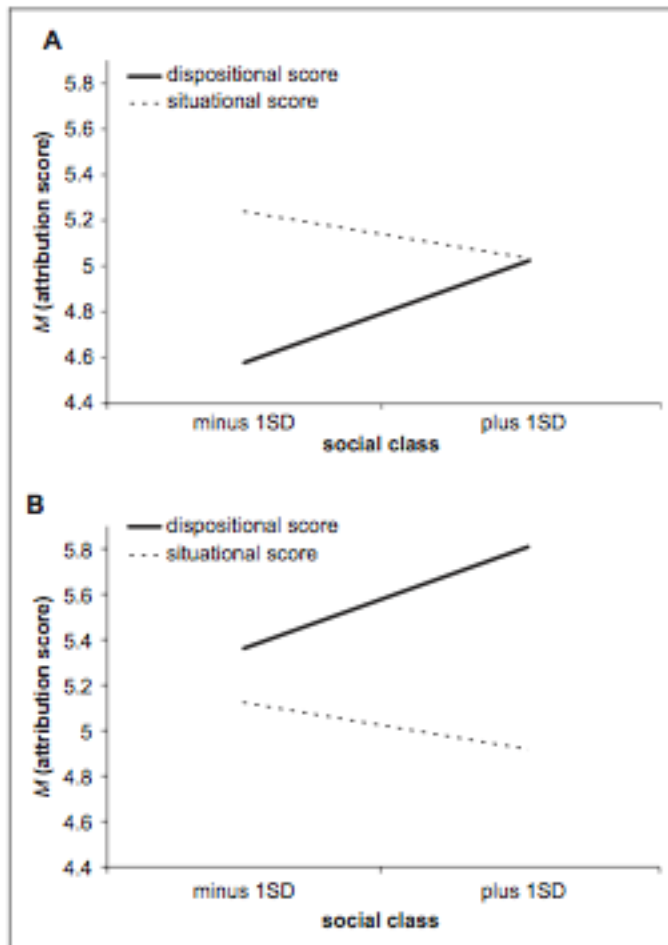


Figure 2.2. Attribution difference scores by country and social class.

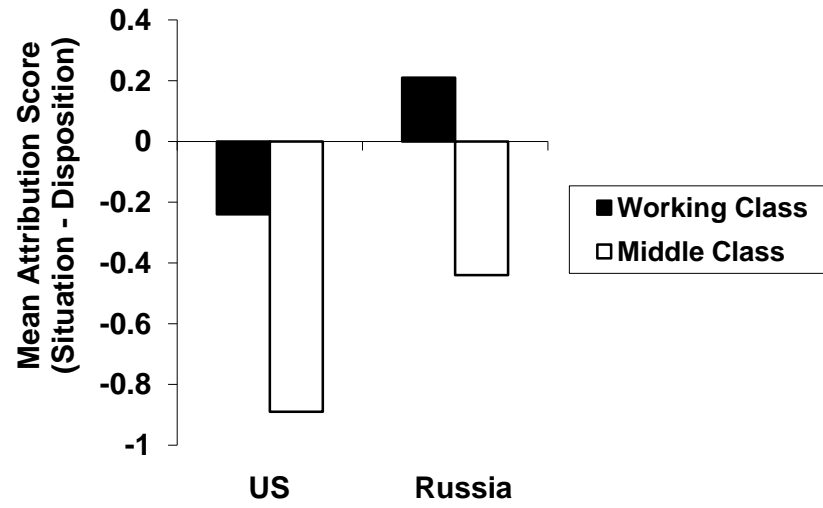
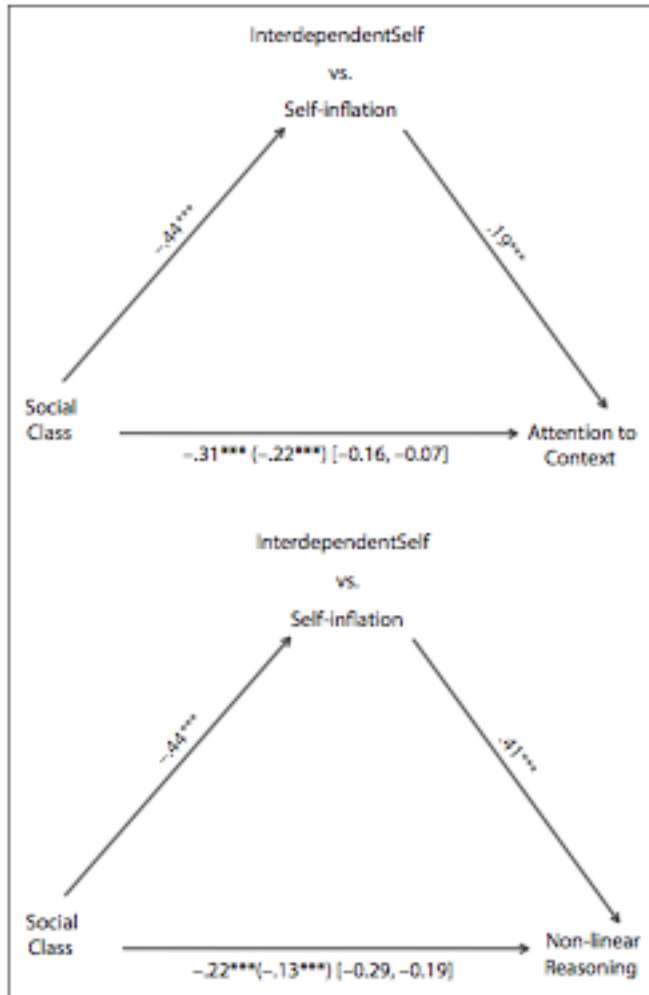


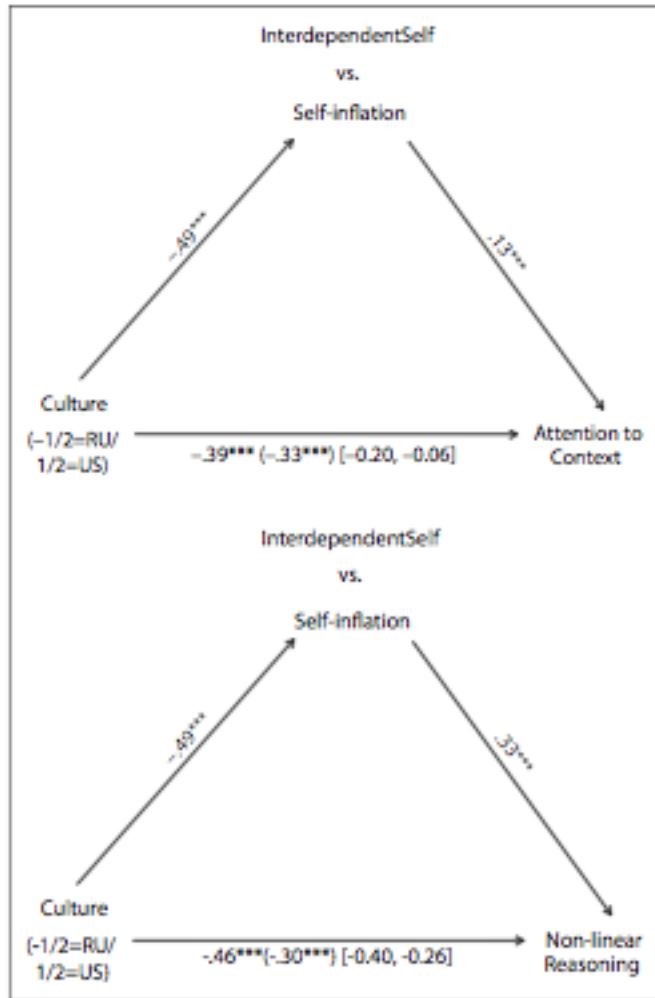
Figure 2.3. Standardized betas from a path analysis examining the role that self-inflation plays in mediating the effect of social class on (a) attention to context versus focal objects (Panel A) and (b) nonlinear versus linear reasoning (Panel B).



Note: Higher scores on the self-inflation measure indicate greater importance placed on close others relative to the self. The standardized coefficients in parentheses show the relationship between social class and the dependent variables after controlling for social orientation. In square brackets are 95% confidence intervals from a bootstrap test; the mediation is significant if the confidence interval does not include zero.

\* $p \leq .05$ . \*\* $p \leq .01$ . \*\*\* $p \leq .001$ .

Figure 2.4. Standardized betas from a path analysis examining the role that self-inflation plays in mediating the effect of culture on (a) attention to context versus focal objects (Panel A) and (b) nonlinear versus linear reasoning (Panel B).



Note: Higher scores on the self-inflation measure indicate greater importance placed on close others relative to the self. The standardized coefficients in parentheses show the relationship between culture and the dependent variables after controlling for social orientation. In square brackets are 95% confidence intervals from a bootstrap test; the mediation is significant if the confidence interval does not include zero.

\* $p \leq .05$ . \*\* $p \leq .01$ . \*\*\* $p \leq .001$ .

## Appendix A:

### Survey K

In the following questionnaire we would like to find out more about the effects of social perceptions of different people. You will be presented with several situations. Each of them will describe a person involved in a certain activity. You will be asked to think about different reasons for this person's behavior, as well as to evaluate this person's behavior.

Please, carefully read and answer the following questions.

#### Situation One

*Emma Peterson is a banker at a large bank in Cincinnati, IN. The current financial difficulties of the bank may have a negative effect on the share-income of the bank's shareholders. In the last couple of months, the bank lost a large amount of money on the stock market. However, Emma Peterson did not reveal the loss to the company's shareholders in order to avoid causing panic. Instead, Emma Peterson reported a sizeable profit at the annual meeting of the shareholders, hoping that the annual balance of the company would still be positive in comparison to the last year.*

Please, carefully read the following statements and indicate your level of agreement with each of them.

1. Emma Peterson's personality primarily influenced her behavior.

Strongly		Somewhat		Somewhat		Strongly
Disagree	Disagree	Disagree	Neither	Agree	Agree	Agree
1	2	3	4	5	6	7

2. Particular circumstances primarily influenced Emma Peterson's behavior.

Strongly		Somewhat		Somewhat		Strongly
Disagree	Disagree	Disagree	Neither	Agree	Agree	Agree
1	2	3	4	5	6	7



## References

- Adler, N. E., Boyce, T., Chesney, M. A., Cohen, S., Folkman, S., Kahn, R. L., et al. (1994). Socioeconomic status and health: The challenge of the gradient. *American Psychologist, 49*, 15-24.
- Argyle, M. (1994). *The Psychology of Social Class* New York: Routledge.
- Bourdieu, P. (1984). *Distinction : a social critique of the judgement of taste*. Cambridge, Mass.: Harvard University Press.
- Bourdieu, P., & Passeron, J. C. (1977). *Reproduction in education, society and culture*. London ; Beverly Hills: Sage Publications.
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology, 1*, 185-216.
- Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture, and subjective well-being: emotional and cognitive evaluations of life. *Annual Review in Psychology, 54*, 403-425. doi: 10.1146/annurev.psych.54.101601.145056  
101601.145056 [pii]
- Duffy, S., Uchida, Y., & Kitayama, S. (2008). Symbolic self-inflation: A cross-cultural comparison. University College - Camden: Rutgers, The State University of New Jersey.
- Durkheim, E. (1893/1933). *The division of labour in society* (G. Simpson, Trans.). New York: Free Press.
- Ehrenreich, B. (1989). *Fear of falling : the inner life of the middle-class* (1st ed.). New York: Pantheon Books.
- Fiori, K. L., Antonucci, T. C., & Akiyama, H. (2008). Profiles of social relations among older adults: a cross-cultural approach. *Ageing & Society, 28*, 29. doi: 10.1017/S0144686X07006472
- Gallo, L. C., Monteros, K. E. d. l., & Shivpuri, S. (2009). Socioeconomic Status and Health: What Is the Role of Reserve Capacity? *Current Directions in Psychological Science, 18*(5), 269-274.
- Gilbert, D. L. (2008). *The American class structure in an age of growing inequality* (7th ed.). Los Angeles: Pine Forge Press.
- Gramsci, A., & Rosengarten, F. (1994). *Letters from prison*. New York: Columbia University Press.
- Grossmann, I., & Kross, E. (in press). The impact of culture on adaptive vs. maladaptive self-reflection. *Psychological Science*.
- Heine, S. J. (2008). *Cultural psychology* (1st ed.). New York: W.W. Norton.
- Ji, L. J., Nisbett, R. E., & Su, Y. (2001). Culture, change, and prediction. *Psychological Science, 12*, 450-456.
- Kitayama, S., Duffy, S., & Uchida, Y. (2007). Self as cultural mode of being. In S. Kitayama & D. Cohen (Eds.), *Handbook of cultural psychology*: Guilford.
- Kitayama, S., Ishii, K., Imada, T., Takemura, K., & Ramaswamy, J. (2006). Voluntary settlement and the spirit of independence: evidence from Japan's "Northern

- frontier". *Journal of Personality and Social Psychology*, 91(3), 369-384. doi: 2006-10940-001 [pii]  
10.1037/0022-3514.91.3.369
- Kitayama, S., Park, H., Sevincer, A. T., Karasawa, M., & Uskul, A. K. (2009). A cultural task analysis of implicit independence: comparing North America, Western Europe, and East Asia. *Journal of Personality and Social Psychology*, 97(2), 236-255. doi: 2009-10712-003 [pii]10.1037/a0015999
- Kohn, M. L. (1969). *Class and conformity: A study in values*. Homewood, IL: The Dorsey Press.
- Kohn, M. L., Naoi, A., Schoenbach, C., Schooler, C., & Slomczynski, K. M. (1990). Position in the class structure and psychological functioning in the United States, Japan, and Poland. *The American Journal of Sociology*, 95(4), 964.
- Kohn, M. L., & Schooler, C. (1969). Class, occupation, and orientation. *American Sociological Review*, 34, 657-678.
- Kohn, M. L., & Schooler, C. (1983). Work and personality : an inquiry into the impact of social stratification. *Modern sociology*.
- Kohn, M. L., Slomczynski, K. M., Janicka, K., Khmelko, V., Mach, B. W., Paniotto, V., et al. (1997). Social structure and personality under conditions of radical social change: A comparative analysis of Poland and Ukraine. *American Sociological Review*, 62(4), 614.
- Kraus, M. W., & Keltner, D. (2009). Signs of socioeconomic status: a thin-slicing approach. *Psychological Science*, 20(1), 99-106. doi: PSCI2251 [pii]  
10.1111/j.1467-9280.2008.02251.x
- Kraus, M. W., Piff, P. K., & Keltner, D. (2009). Social class, sense of control, and social explanation. *Journal of Personality and Social Psychology*, 97(6), 992-1004. doi: 2009-22579-014 [pii]  
10.1037/a0016357
- Kühnen, U., Hannover, B., Röder, U., Schubert, B., Shah, A. A., & Zakaria, S. (2000). Cross-cultural variations in identifying embedded figures: Comparisons from the US, Germany, Russia and Malaysia. *Journal of Cross-Cultural Psychology*, 32, 365-371.
- Kühnen, U., Hannover, B., Roeder, U. R., Shah, A. A., Schubert, B., Upmeyer, A., et al. (2001). Cross-cultural variations in identifying embedded figures: Comparisons from the United States, Germany, Russia, and Malaysia. *Journal of Cross-Cultural Psychology*, 32, 365-371.
- Lareau, A. (2003). *Unequal childhoods*. Berkeley: University of Berkeley Press.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224-253.
- Marx, K. (1956). *Selected writings in sociology and social philosophy* (T. B. Bottimore, Trans.). New York: McGraw Hill.
- Masuda, T., Gonzalez, R., Kwan, L., & Nisbett, R. E. (2008). Culture and aesthetic preference: comparing the attention to context of East Asians and Americans. *Personality and Social Psychology Bulletin*, 34(9), 1260-1275. doi: 34/9/1260 [pii]  
10.1177/0146167208320555

- Masuda, T., & Nisbett, R. E. (2006). Culture and change blindness. *Cognitive Science*, 30, 381-399.
- Matsumoto, D., Takeuchi, S., Andayani, S., Kouznetsova, N., & Krupp, D. (1998). The contribution of individualism vs. collectivism to cross-national differences in display rules. *Asian Journal of Social Psychology*, 1(2), 147.
- Naumov, A. (1996). "Hofstede's measurement of Russia: the influence of national culture on business management". *Journal of Health Organization and Management*, 1(3), 70.
- Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psychological Review*, 108(2), 291-310.
- Oakes, J. M., & Rossi, P. H. (2003). The measurement of SES in health research: current practice and steps toward a new approach. *Social Science & Medicine*, 56(4), 769-784. doi: S0277953602000734 [pii]
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36(4), 717-731.
- Realo, A., & Allik, J. (1999). A cross-cultural study of collectivism: A comparison of American, Estonian, and Russian students. *The Journal of Social Psychology*, 139(2), 133.
- Saxe, G. B. (1999). Cognition, development, and cultural practices. In E. Turiel (Ed.), *Culture and Development. New Directions in Child Psychology*. SF: Josser-Bass.
- Schooler, C. (2007). Culture and social structure: The relevance of social structure to cultural psychology. In S. Kitayama & D. Cohen (Eds.), *Handbook of cultural psychology*: Guilford.
- Schooler, C., Samuel, M., & Oates, G. (2004). Occupational self-direction, intellectual functioning, and self-directed orientation in older workers: Findings and implications for individuals and societies. *American Journal of Sociology*, 110, 161-197.
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: new procedures and recommendations. *Psychological Methods*, 7(4), 422-445.
- Snibbe, A. C., & Markus, H. R. (2005). You can't always get what you want: educational attainment, agency, and choice. *Journal of Personality and Social Psychology*, 88(4), 703-720. doi: 2005-02948-008 [pii]  
10.1037/0022-3514.88.4.703
- Stephens, N. M., Markus, H. R., & Townsend, S. S. (2007). Choice as an act of meaning: the case of social class. *Journal of Personality and Social Psychology*, 93(5), 814-830. doi: 2007-15390-008 [pii]  
10.1037/0022-3514.93.5.814
- Tudge, J. R. H., Hogan, D. M., Snezhkova, I. A., Kulakova, N. N., & Etz, K. E. (2000). Parents' child-rearing values and beliefs in the United States and Russia: the impact of culture and social class. *Infant and Child Development*, 9(2), 105-121.
- Varnum, M. E., Grossmann, I., Kitayama, S., & Nisbett, R. E. (2010). The Origin of Cultural Differences in Cognition: Evidence for the Social Orientation

Hypothesis. *Current Directions in Psychological Science*, 19(1), 9-13. doi:  
10.1177/0963721409359301

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge: Harvard University Press.

Willis, P. E. (1981). *Learning to labor : how working-class kids get working-class jobs*. New York: Columbia University Press.

## Chapter 3:

### Social Class Differences in N400 indicate differences in Spontaneous Trait Inference

Since at least the time of Marx (1845/1970) social scientists have hypothesized that social class has cognitive consequences. Yet only recently have psychologists begun to systematically explore the effect of social class on cognitive habits. An emerging literature suggests that people from working-class backgrounds tend to have more holistic cognitive habits than those from middle-class backgrounds. For example, compared to middle-class Americans, working-class Americans tend to have more contextual patterns of visual attention (Na, et al., 2010; Grossmann & Varnum, 2011), and tend to reason more dialectically about the development of trends (Grossmann & Varnum, 2011).

People from working-class backgrounds also seem to be less prone to fundamental attribution error (FAE) than those from middle-class backgrounds. FAE has been defined as a tendency to give undue weight to internal factors (such as personality traits, desires, and intentions) and to under-weight situational pressures and constraints when explaining the behavior of others (Ross, 1977). Krauss and colleagues (2009) have found that working-class people are more likely to believe that situational factors play a causal role in societal patterns, individual outcomes, and emotions. Similarly, Grossmann and Varnum (2011) have found that people from working-class backgrounds

show less dispositional bias than do people from middle-class backgrounds when asked to explain the behaviors of others.

These class-based differences in causal inference have been interpreted as reflecting differential awareness of the structural and situational constraints on individual action that come with different positions in the class structure (Kraus, Piff, & Keltner, 2009). People from working-class backgrounds are likely to have a greater number of experiences where choices and actions are constrained due to financial pressure. Working-class parents also tend to emphasize obedience whereas middle-class parents try to foster self-direction (Kohn, 1969; Kohn & Schooler, 1983). Such experiences might make situational constraints more salient for people from working-class backgrounds when reasoning about causality.

While it has been established that social class differences in causal inference exist, when and how such differences emerge is still an open question. Gilbert and Malone's (1995) 2-stage model of person perception holds that people automatically infer traits from behavior, but that they may engage in a second, more deliberate stage of processing where they weigh the impact of situational factors. Thus, the final outcome in attribution is always a joint product of an initial trait inference and a later situational adjustment.. It is not obvious though at which stage social class differences emerge.

On the one hand, it may be that class-based differences in causal inference are due to a correction for automatic dispositional bias. In fact, working-class people are more interdependent than middle-class people (Grossmann & Varnum, 2011; Kraus, Côté, & Keltner, 2010; Na et al., 2010) and thus may be more motivated to attempt to maintain social harmony by taking context into account when explaining others' behavior. Or it

may simply be that because working-class people pay more attention to context than for middle-class people (Grossmann & Varnum, 2011; Na et al., 2010;), the former may be able to recognize more situational constraints than the latter and thus more likely to adjust for situational influences when making causal inferences... In any case, according to this view, social class differences in causal inferences are largely driven by the second stage in Gilbert and Malone's (1995) model. If this is the case, then one would not expect social class differences to emerge in initial trait inference, but rather that the differences are due to differences in a later stage, more deliberate process.

However, on the other hand, it may be that social class differences in attribution reflect differences in the initial automatic processing of trait relevant information. Situational constraints on behavior are likely to be more chronically salient for working-class people than they are for middle-class people due to life experiences and socialization. If this is the case, then one might expect that working-class people may engage in dispositional inferences much less than their middle-class counterparts and consequently, trait-inference may be at least less automatic among working-class people than among middle-class people.

The major question that the present study seeks to address is whether social classes differ in spontaneous initial trait inference. A recently developed ERP paradigm allows us to address this issue. In their original study, Na and Kitayama (in press) had participants remember pairings of a face and a trait-implying behavior. Note that since they were just asked to remember the pairings, any trait inferences made during this phase can be considered spontaneous and automatic. To measure whether participants had engaged in spontaneous trait inference (STI) during the memorization phase, participants

were asked to complete a subsequent lexical decision task. In this task, the previously learned faces served as a fixation point and the target stimuli were either a trait word that was implied by information learned about the individual, in the first phase, the antonym of the implied trait, or letter strings. The logic behind this design was that if participants made spontaneous trait inferences, then they would feel inconsistency when a face was paired with the antonym of the previously implied trait. In other words, semantic inconsistency induced by the antonym served as an index of spontaneous trait inference. This type of semantic incongruence is known to be captured by a specific ERP component called as N400, a negative peak occurring approximately 400 ms post-stimulus presentation (Kutas & Hillyard, 1980). Using this paradigm, Na and Kitayama (in press) demonstrated that European-Americans spontaneously engage in automatic trait inference, but Asian-Americans do not.

In the present study, using the ERP paradigm developed by Na and Kitayama (in press), we sought to test whether social class differences in attribution within the US might also be due to differences in automatic person perception. We predicted that Americans from middle-class backgrounds would engage in spontaneous trait inference and thus feel inconsistency when exposed to faces followed by a trait word that is incongruent with information previously learned about the behavior of those individuals, which would result in a distinctive N400 response to these antonyms. However, we predicted that this effect would be much weaker or even absent among those from working-class backgrounds. Furthermore, we argue that differences in STI occur because people from working-class backgrounds are more aware than those from middle-class backgrounds of situational and contextual influences on behavior. If this is the case, there



should be corresponding social class differences in lay theory of social behavior, such that those from working-class backgrounds endorse situational models of causality and those from middle-class background endorse models that give greater weight to dispositional factors. To test this premise, we also measured participants' lay theories of causation, and we investigated the relationship between lay causal theories and spontaneous trait inference as indexed by N400.

## Methods

### *Participants*

Twenty undergraduates with middle-class backgrounds (12 females) and 22 undergraduates with working-class backgrounds (12 females) at the University of Michigan participated in return for monetary compensation (\$20)<sup>1</sup>.

Parental education was used as the indicator of social class. Participants with at least one parent who received a bachelor's or more advanced degree were defined as middle-class; those who did not have a parent who had completed college were defined as working-class (as in Stephens, Markus, & Townsend, 2007).

### *Procedures*

Participants were told that the study was an investigation of how people remember social information. Then, they were further instructed to read and remember all the information presented on a computer screen. The stimuli consisted of sixty pairings of faces and sentences describing behavior were then presented in a random order. The face was first presented for 2 s. The behavior was then presented along with the face, and stayed on the screen for 7 s. There were 30 faces (15 males & 15 females) and 60 behaviors. Each face was paired with two different behaviors that implied the same trait (e.g. "His neighbor trusts him to watch her three year old son" and "If he had to, he

would stay up until 3 am to make sure the project got done” implying the target is reliable).

After the memorization phase of the study, participants were asked to complete a lexical decision task was framed as a filler task. In fact, the task was designed to assess the magnitude of face-trait associations. As illustrated in Figure 3.1, each trial consisted of a face prime presented for 1500 ms as a fixation, immediately followed by presentation of a target stimulus for 200 ms. Participants were given up to 5000 ms to make a lexical decision regarding the target. 1400 ms after the decision period, the next trial started. To examine brain reaction in response to semantic incongruity, traits implied by the stimulus behaviors and their antonyms served as word targets in the lexical decision task. For each of the 30 faces we prepared a trait word that was implied by the two behaviors paired with the face (congruous trials), the antonym of the implied trait (incongruous trials), and two pseudo-word stimuli (pseudo-word trials). This yielded 120 (30 x 4) trials in total. To ensure that the same set of trait words would be used on both the congruous trials and the incongruous trials, one trait word was served as the implied trait for one face and as the incongruous trait (the antonym of an implied trait) for another face. Thus, the congruity/incongruity of trait words were not confounded with the specific traits that were used.

After the computer task, participants were given a measure of lay theory of social behavior (Norenzayan, Choi, & Nisbett, 2002). The questionnaire contained three arguments reflecting dispositionism and situationism (see Appendix A). Participants indicated how much they agreed with each of three arguments on a 9-point scale (1 = Strongly Disagree, to 9 = Strongly Agree). Upon completion of the questionnaire,

demographic information was collected and participants were fully debriefed and dismissed.

### *Physiological Recording and Processing*

The EEG was recorded with 32 electrodes placed according to the extended International 10/20-System in a nylon cap, and referenced to the left mastoid. The electrooculogram (EOG) was recorded from additional channels at the outer canthi of both eyes and above and below the left eye. EEG and EOG signals were amplified with a band-pass of DC to 100Hz by BioSemi Active-Two system, and sampled with 512Hz. All data was then re-referenced to the averaged left and right mastoid, and re-sampled at 256Hz. The EEG for each trial was corrected for vertical and horizontal EOG artifacts as in Gratton, Cole, and Donchin (1983). ERPs to word targets were averaged over an epoch of 1200 ms (starting 200 ms prior to the presentation of each target), using a 200-ms prestimulus baseline. Only segments with correct responses were averaged. The trials with deflection exceeding  $\pm 100 \mu\text{V}$  were excluded from averaging. The data were digitally low-pass filtered at 12 Hz for Figure 3.2.

## Results

### *ERP Data Analysis*

The time course of ERPs was examined at all scalp locations first. The clearest pattern was identified in the posterior central (Pz) scalp location as in the previous study using the same paradigm (Na and Kitayama, in press). This is also consistent with previous work showing that the visual N400 is most clearly observed in the centro-posterior region of the brain (Kutas & Federmeier, 2000).

The ERPs to the target words (either “implied” or “incongruous”) were depicted in Figure 4.1. We hypothesized that middle-class participants would show a clear sign of

N400 in response to incongruous traits as opposed to implied traits; in contrast we predicted that this effect would be much weaker among working-class participants. As shown in Figure 4.2, the expected pattern was observed. For middle-class participants, the difference between implied traits and incongruous traits clearly emerged around 400 ms after the onset of the target words such that N400 was much more distinctive for incongruous traits than for implied traits. However, working-class participants did not show a difference between implied traits and incongruous traits.

Since the waveform can sometimes be misleading because of individual variation among participants (e.g., outliers), mean amplitudes for the relevant time interval (350-450 ms) were computed for statistical comparison. Most importantly, a 2 (Class: middle-class vs. working-class) x 2 (Congruency: implied vs. incongruous) ANOVA revealed a significant class x congruency interaction,  $F(1, 40) = 6.02, p < .05, \eta_p^2 = .13$ . For middle-class participants, mean amplitudes were smaller for incongruous traits than for implied traits,  $M_s = 8.75$  vs.  $6.54, t(19) = 3.99, p = .001$ . In contrast, for working-class participants there was no effect on congruency on ERP deflection,  $M_s = 8.39$  vs.  $8.29, t(21) = .15, p = ns$ .

Taken together, the results clearly suggest that middle-class participants drew strong trait inferences during the memorization phase of the study. Therefore, they later displayed clear evidence of semantic inconsistency (i.e., N400) when previous studied faces were paired with incongruous traits. However, we failed to find any evidence of spontaneous trait inference among our working-class participants. Their ERPs to the target words did not systematically vary as a function of congruency.<sup>2</sup>

*Lay Theory of Social Behavior*

We suspected that social class differences in spontaneous trait inference might be related to the corresponding differences in lay theories of causality. To test this proposition, we examined whether the class-based difference that we observed in the N400 incongruity effect might be related to participants' lay causal theories..

To test the prediction, we first conducted 2 (Class: middle-class vs. working-class) x 2 (theory: dispositionism vs. situationism) ANOVA. Consistent with our predictions, the class x causal theory interaction was significant,  $F(1, 40) = 7.06, p < .05, \eta_p^2 = .15$  (see Figure 3.3). Middle-class participants endorsed dispositionism more than situationism  $M_s = 6.35$  vs.  $5.05, t(19) = 1.75, p = .097$ , whereas the opposite was the case for working-class participants,  $M_s = 4.59$  vs.  $5.91, t(21) = 2.03, p = .056$ . Seen from a different angle, middle-class participants showed greater endorsement of dispositionism than did working-class participants, ( $M_s = 6.35$  vs.  $4.59$ ),  $t(40) = 2.76, p < .01$ . The opposite pattern was found for endorsement of situationism, (middle-class  $M = 5.05$  & working-class  $M = 5.91$ ), although the difference failed to reach statistical significance,  $t(40) = 1.32, p = .19$ . The results confirmed our hypothesis that middle-class more strongly believe that one's behavior is driven by his or her internal disposition such as personality than working-class participants.

Next, we examined whether the lay theory of social behavior could predict spontaneous trait inference as measured with N400. First, we created an index of participants' lay theory by subtracting situationism from dispositionism, with higher scores indicating more dispositional patterns of attribution. As predicted, Middle-class participants ( $M = 1.30$ ) scored higher than working-class participants ( $M = -1.32$ ),  $t(40) = 2.66, p = .01$ . Then, the index of the N400 incongruity effect was also calculated by

subtracting the mean amplitudes of incongruous traits from those of implied traits. Note that larger values in this index reflects more spontaneous trait inference. Consistent with our predictions, lay causal theory significantly predicted the N400 incongruity effect,  $\beta = 0.32, p < .05$  (see Figure 3.4). That is, those who more strongly believed in dispositionism showed greater STI.

### Discussion

As predicted, we found evidence that middle-class, but not working-class, Americans engage in STI. This finding suggests that the social class differences observed in self-report measures of causal inference, such as explanations for societal phenomena and individual outcomes (Kraus, Piff, & Keltner, 2009), and attributions for the actions of individuals (Grossmann & Varnum, 2011), may be due to differences in early, automatic inference processes (as opposed to a relatively late stage correction for initial dispositional biases).

The social class effects we observed in trait-congruence related N400 were parallel to the cultural differences observed by Na and Kitayama (in press). Na and Kitayama (in press) show that spontaneous trait inference is relatively unique to people living in independent cultures (e.g., European Americans). The present work extends that finding, and suggests that STI may be further limited to those from middle-class backgrounds. It should be noted that our working-class sample might be somewhat atypical as they are enrolled at one of the top US Universities, however the fact parental social class had an effect in this setting suggests that the influence of social class on cognitive habits is in fact highly persistent. Nonetheless, it may be worthwhile to

replicate the present study with a non-student sample. It may also be interesting to see if this effect can be replicated in a predominantly interdependent culture, such as Japan.

Although there is a growing literature documenting SES-related neurocognitive deficits (for a review, see Hackman & Farah, 2009), the present study is one of the first neuroscience studies to address social class differences in cognition (analytic vs. holistic) that reflect different habitual modes of thinking as opposed to deficits. Further, while our results are consistent with previous literature on social class, the present study extends that literature by showing that social class affects automatic neural responses. Given the current findings, we believe that future research using ERP and fMRI to explore the psychological consequences of social class is likely to be fruitful and will add to our understanding of how social class shapes neural processes.

## Footnotes

1. We did not find any significant gender effects.
2. We also examined whether main effects or class x congruence interactions were present at two earlier time regions around 100 ms (50–150 ms) and 200 ms (150–250 ms). Neither interaction was significant ( $F_s < 1$ ). Nor was there a significant effect for class at 200 ms,  $F(1,40) = 1.59$ ,  $p = ns$ . There was however a marginally significant main effect for class at 50-150 ms,  $F(1, 40) = 3.61$ ,  $p = .07$ . No interpretation was attempted.



Figure 3.1. Trial structure of the lexical decision task adapted from Na and Kitayama (in press).

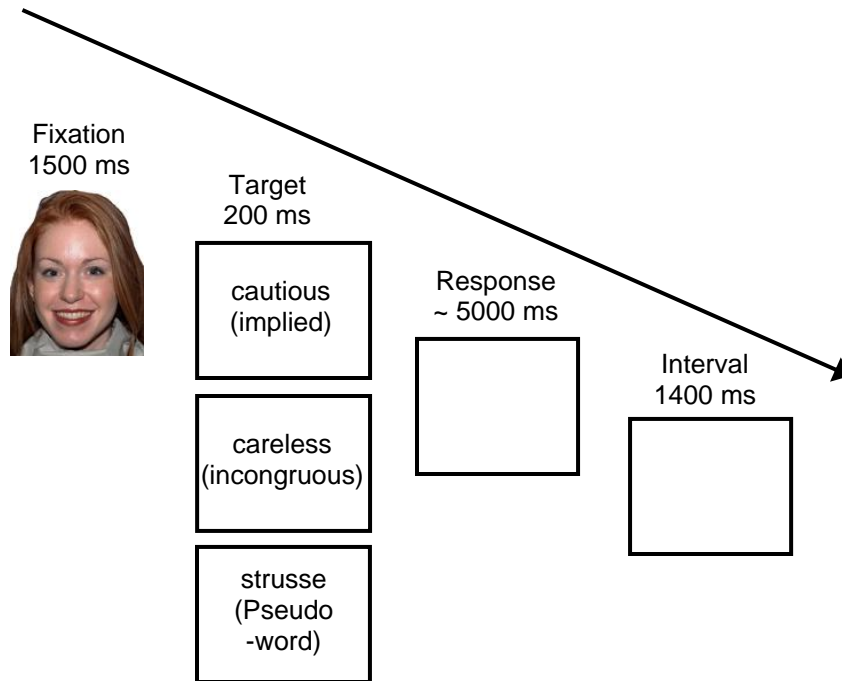


Figure 3.2. Grand-averaged ERPs at Pz in the implied trait condition and the incongruous trait (antonym) condition for middle-class and working-class participants. Note that negative deflections of ERPs are shown in the upward direction on the y-axis.

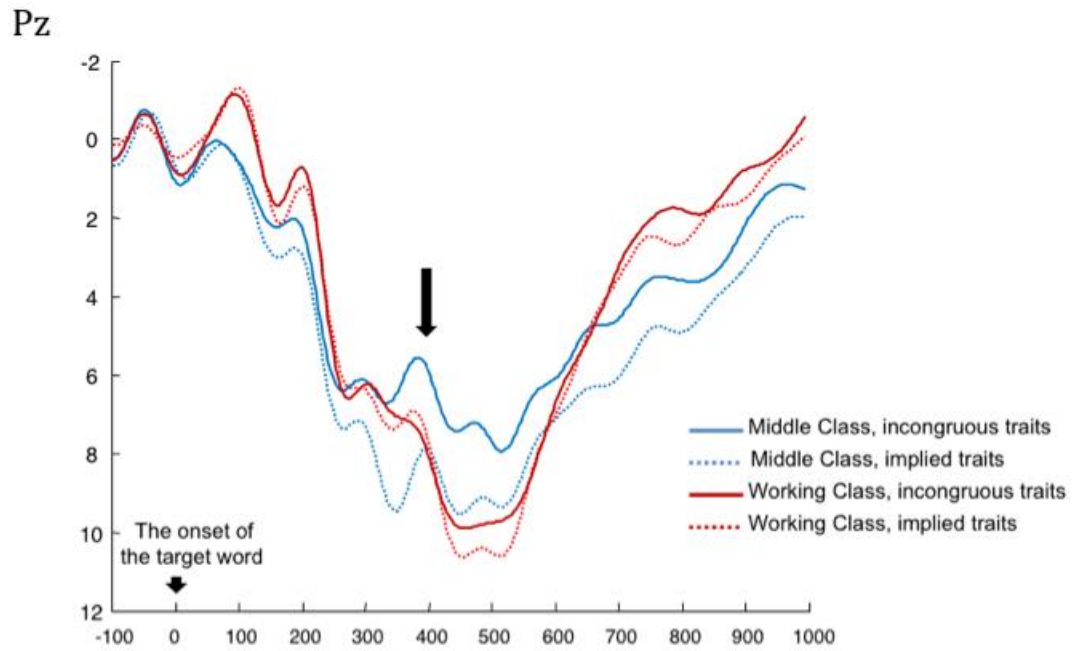


Figure 3.3. Endorsement of dispositionism and situationism by social class

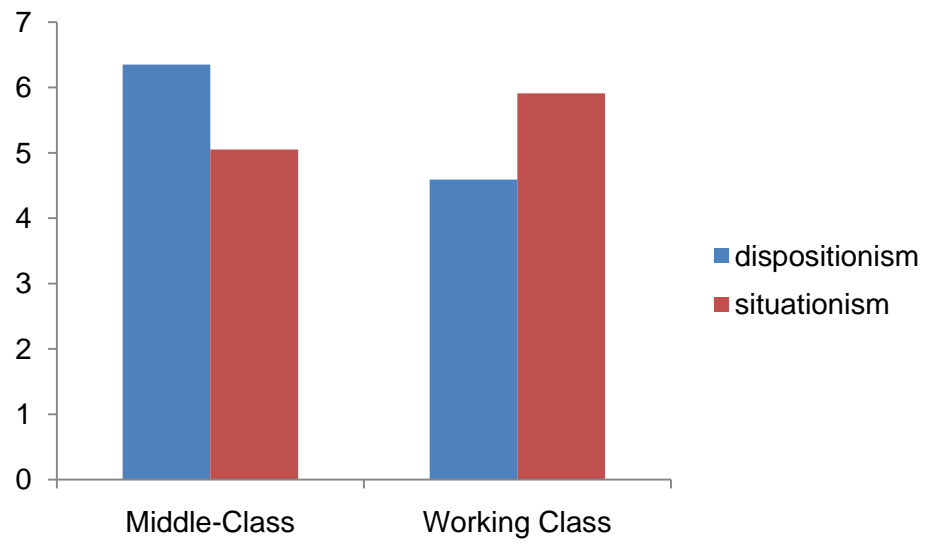
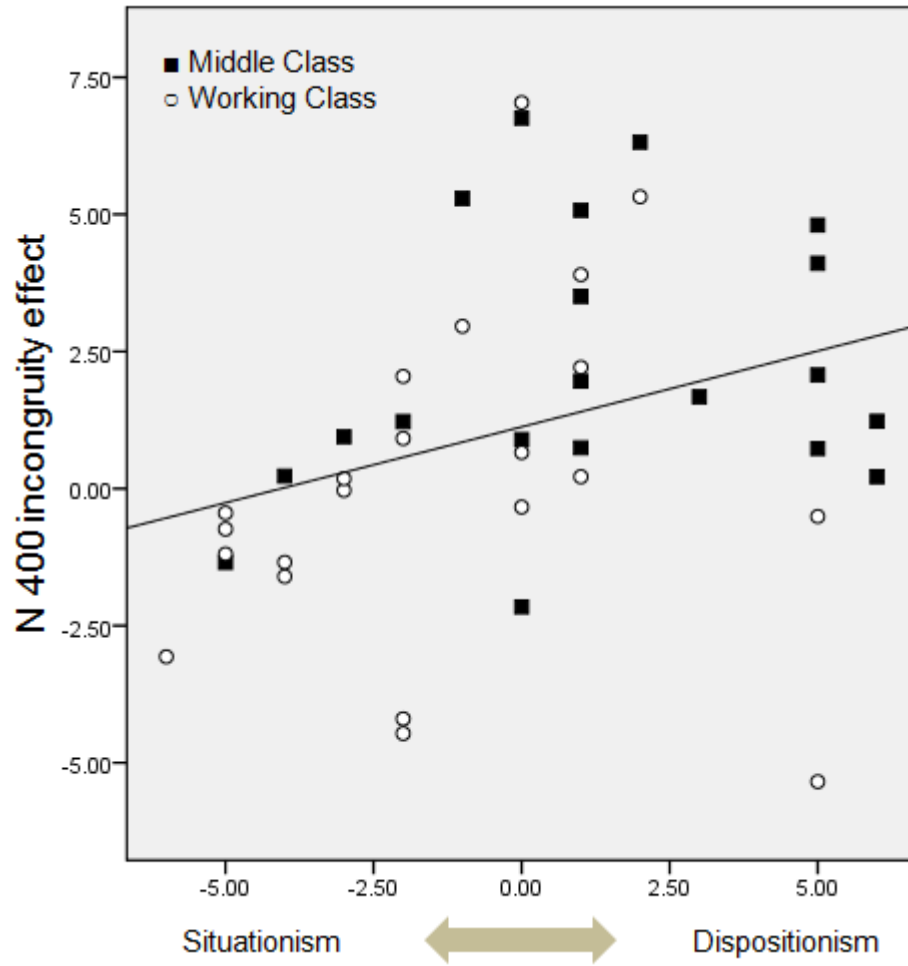


Figure 3.4. The association between the lay causal theory and the N400 incongruity effect.



## Appendix A. Lay Causal Belief Items

### Dispositionism

How people behave is mostly determined by their personality. One's personality predisposes and guides an individual to behave in one way, not in another way, no matter what circumstances the person is in. In a sense, behavior is an unfolding of personality. One's behavior is remarkably stable across time and consistent across situations because it is guided by personality. Therefore, if we know the personality of one person, we can easily predict how the person will behave in the future and explain why that person behaved in the particular way in the past.

### Situationism

How people behave is mostly determined by the situation in which they find themselves. Situational power is so strong that we can say it has more influence on behavior than one's personality. Often, people in a particular situation behave very similarly, despite large individual differences in personality. Therefore, in order to predict and explain one's behavior, we have to focus on the situation rather than personality. Personality plays a weaker role in behavior than we used to think.

## References

- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173-1182.
- Choi, I., & Nisbett, R. E. (1998). Situational salience and cultural differences in the correspondence bias and actor-observer bias. *Personality and Social Psychology Bulletin*, *24*, 949-960.
- Gratton, G., Coles, M.G.H., & Donchin, E. (1983). A new method for off-line removal of ocular artifact. *Electroencephalography and Clinical Neurophysiology*, *55*, 468–484.
- Grossmann, I., & Varnum, M.E.W. (2011). Social class, culture, and cognition. *Social Psychological and Personality Science*, 81-89.
- Hackman, D. A., & Farah, M. J. (2009). Socioeconomic status and the developing brain. *Trends in Cognitive Sciences*, *13*, 65–73.
- Kitayama, S., Ishii, K., Imada, T., Takemura, K., & Ramaswamy, J. (2006). Voluntary settlement and the spirit of independence: Evidence from Japan's "Northern frontier." *Journal of Personality and Social Psychology*, *91*, 369–384.
- Kohn, M. L. (1969). *Class and conformity: A study in values*. Homewood, IL: The Dorsey Press.
- Kohn, M. L., & Schooler, C. (1983). Work and personality: An inquiry into the impact of social stratification. *Modern sociology*.
- Kutas, M., & Federmeier, K. D. (2000). Electrophysiology reveals semantic memory use during language comprehension. *Trends in Cognitive Science*, *4*, 463–470.
- Kutas, M., & Hillyard, S. A. (1980). Reading senseless sentences: Brain potentials reflect semantic incongruity. *Science*, *207*, 203-208
- Kraus, M. W., Piff, P. K., & Keltner, D. (2009). Social class, sense of control, and social explanation. *Journal of Personality and Social Psychology*, *97*(6), 992-1004. doi: 2009-22579-014.
- Kraus, M.W., Côté, S., & Keltner, D. (2010). Social class, contextualism, and empathic accuracy. *Psychological Science*, *21*, 1716-1723.
- Marx, K., & Engels, F. (1970). *The German ideology*. 3d rev. ed. Moscow: Progress Publishers. Originally published 1845-1849.
- Na, J., Grossmann, I., Varnum, M.E.W., Kitayama, S., Gonzalez, R., & Nisbett, R.E. (2010). Cultural differences are not always reducible to individual differences. *Proceedings of the National Academy of Sciences of the USA*, *107*, 6192-6197.
- Na, J., & Kitayama, S. (in press). Spontaneous trait inference is culture specific: Behavioral and neural evidence. *Psychological Science*.
- Norenzayan, A., Choi, I., & Nisbett, R. E. (2002). Cultural similarities and differences in social inference: Evidence from behavioral predictions and lay theories of behavior. *Personality and Social Psychology Bulletin*, *28*, 109-120.
- Ross, L. (1977). The intuitive psychologist and his shortcomings: Distortions in the attribution process. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10). New York: Academic Press, 1977.

Stephens, N. M., Markus, H. R., & Townsend, S. S. (2007). Choice as an act of meaning: the case of social class. *Journal of Personality and Social Psychology*, 93, 814-830. doi: 2007-15390-008 [pii]

## Chapter 4:

### What's in a Name? Popular Names are less Common on Frontiers

According to the voluntary-settlement hypothesis (Kitayama, Conway, Pietromonaco, Park, & Plaut, 2010; Kitayama, Ishii, Imada, Takemura, & Ramaswamy, 2006), the conditions of frontier settlement attract independently oriented individuals (e.g., people high in openness to experience and low in agreeableness; Jokela, 2009). At the same time, frontier conditions breed independent orientations even among people who are initially more interdependent. This hypothesis is supported by the well-documented association between residential mobility and independent orientation (Oishi, Lun, & Sherman, 2007). However, it also moves beyond that association by specifying other features of the frontier that are likely to encourage independence, such as low population density and an associated herding economy (Uskul, Kitayama, & Nisbett, 2008), relative lack of social connections and institutions (Kitayama et al., 2010), decreased risk of pathogen infections (Fincher, Thornhill, Murray, & Schaller, 2008), and potentially high returns for risks taken (Kitayama et al., 2010).

Contemporary data showing that endorsement of individualistic values is stronger in recently settled U.S. states (e.g., Montana and Utah) than on the East Coast of the United States provides support for this account (Park, Conway, Pietromonaco, Plaut, & Kitayama, 2009; Plaut, Markus, & Lachman, 2002). Parallel differences can be observed between the residents of Hokkaido, which was settled by ethnic Japanese in the late 19th century, and the main islands of Japan (Kitayama et al., 2006), and between the



United States and countries (e.g., England and Germany) that colonized it (Kitayama, Park, Sevincer, Karasawa, & Uskul, 2009). Values and psychological orientations of independence might then be expected to guide overt social behaviors to form the frontier ethos that is characterized by a strong commitment to personal autonomy, initiative, and uniqueness. In an important study, Vandello and Cohen (1999) found that more recently settled U.S. regions scored higher than less recently settled U.S. regions on an index of the frequency of residents' behaviors that could be guided by individualistic values (e.g., living alone after age 65, self-employment, and divorce). Yet most of the behaviors tested by Vandello and Cohen can also be strongly influenced by factors that are conceptually distinct from independence or individualism per se. For example, the percentage of individuals who are self-employed will depend on the availability of employment opportunities in a given region. Likewise, the divorce-marriage ratio may change as a function of such factors as religiosity and spousal abuse. We sought to fill this knowledge gap by examining a deliberate behavioral choice of substantial consequence that is clearly linked to independent values: namely, giving uncommon names (as opposed to popular names) to new babies.

The choice that parents make between popular names and relatively uncommon names for their children has face validity as an indicator of independent beliefs and values. Therefore, it was used recently by Twenge, Abebe, and Campbell (2010) in their study of cultural changes in independence in the United States<sup>1</sup>. They observed that independence, as assessed in terms of how parents name their children, has increased over the past several decades within the United States. Naming practices embody important cultural values (Liebersen & Bell, 1992) and are linked to a host of

psychological, social, and economic outcomes (Christenfeld & Larsen, 2008).

Furthermore, choosing a name is viewed as a fairly important decision, one of great interest to parents (a recent Google search for “baby names” returned 8 million results) and one that is often made after lengthy deliberation, sometimes even with the aid of paid professionals (Alter, 2007).

Consistent with the voluntary-settlement hypothesis, our prediction was that popular names would be chosen on frontiers less often than in comparable regions that have little or no history of frontier settlement. In three studies, we tested this prediction in terms of both within-country and cross-national variation. We computed the percentages of four naming variables: babies given (a) the most popular boy’s name, (b) the most popular girl’s name, (c) 1 of the 10 most popular boys’ names, and (d) 1 of the 10 most popular girls’ names in their respective state (Study 1), province (Study 2), or country (Study 3)

### Study 1

In this study, we compared regions of the United States that were more recently settled with regions that were less recently settled. Specifically, we predicted that a greater percentage of babies would be given popular names in New England than in the Pacific Northwest and Mountain West regions (see Table 3.1 for a listing of the states in these regions). Furthermore, we predicted that the year in which states were admitted to the United States (a proxy for length of settlement) would be negatively correlated with the percentage of children receiving popular names.

### *Method*

We gathered data on names from the Social Security Administration's (2010) database of popular baby names for each state in 2007. This database represents a complete sample of Americans born in 2007 who were issued Social Security cards ( $N = 4,309,707$ ). We also gathered data on the number of live births and the percentage of the Caucasian population per state in 2007 from the U.S. Census Bureau's (2008) Statistical Abstract of the United States, 2007. We then computed the percentages of the four naming variables for each of the states in the New England region (which were some of the earliest established in the United States) and for each of the frontier states in the Mountain West and Pacific Northwest regions (which were more recently settled).

### *Results*

As predicted, a greater percentage of babies were given popular names in the New England states than in the frontier states (Table 4.1 presents data for individual states). This held true for all states in those regions on each of the four variables. A one-way analysis of variance (ANOVA) comparing the two regions (Region 1 = New England, Region 2 = Mountain West and Pacific Northwest) found that a greater percentage of babies were given the most popular boy's name,  $F(1, 12) = 65.85, p < .001, d = 4.47$ , or the most popular girl's name,  $F(1, 12) = 61.67, p < .001, d = 4.00$ , in New England than in the frontier states. We observed the same pattern of regional difference in the percentage of babies given 1 of the 10 most popular boys' names,  $F(1, 12) = 70.78, p < .001, d = 4.39$ , or 1 of the 10 most popular girls' names,  $F(1, 12) = 103.80, p < .001, d = 5.34$ . We obtained comparable results after sorting the states into quintiles based on the percentage of babies given 1 of the 10 most common boys' or girls' names (see Figs. 4.1a

and 4.1b). The results did not change when we controlled for state-wise percentages of various ethnic minorities (see Supplementary Information in Appendix A).

When we examined the correlation between the relative frequency of popular baby names and the year in which each of the 50 states was admitted to the United States, we found that the year in which statehood was achieved was negatively correlated with the percentage of infants receiving the most popular boy's name,  $r = -.52, p < .001$ , and the percentage of infants receiving the most popular girl's name,  $r = -.45, p < .001$ , as well as the percentage receiving 1 of the 10 most popular boys' names,  $r = -.60, p < .001$ , or 1 of the 10 most popular girls' names,  $r = -.44, p < .001$  (see Figs. 4.2a and 4.2b). These relations remained unchanged when we controlled for median income and population density (see Table 4.2); controlling for state-wise percentages of various ethnic minorities, including Hispanics, Blacks, and Asians, also did not change these relations (see Supplementary Information in Appendix A).

## Study 2

In Study 2, we sought to replicate the regional differences observed in Study 1 in another country with a history of voluntary settlement: Canada. We predicted that a greater percentage of babies would be given popular names in provinces in the eastern regions of Canada (which were settled earlier) than in provinces in the western regions of Canada (which were settled more recently).

### *Method*

We gathered data on baby names in 2007 for seven provinces, including three eastern provinces (Nova Scotia, Ontario, and Quebec) and four western provinces (Alberta, British Columbia, Manitoba, and Saskatchewan). Data on names and live births

were gathered from the responsible authorities in each province (see Appendix A for a complete list of sources; note that the Ontario data came from 2003). We computed the percentages of the four naming variables for each eastern province and for each western province.

### *Results*

Consistent with our predictions, our results showed that popular names were relatively more common in eastern Canada than in western Canada (Table 4.3 provides data for individual provinces). A one-way ANOVA comparing the two regions (Region 1 = eastern Canadian provinces, Region 2 = western Canadian provinces) found that a greater percentage of babies were given the most popular boy's name in eastern Canada,  $F(1, 5) = 26.78, p = .004, d = 4.00$ . Although the pattern was the same for the most popular girl's name, the difference did not reach statistical significance,  $F(1, 5) = 3.51, p = .12, d = 1.3$ . We observed the same pattern of regional difference in the percentage of babies given 1 of the 10 most popular boys' names,  $F(1, 5) = 22.76, p = .005, d = 3.29$ , or 1 of the 10 most popular girls' names,  $F(1, 5) = 5.73, p = .06, d = 1.65$ . Controlling for the percentage of the population that indicated French or another language as its mother tongue did not affect the results, all  $F_s > 14$ , all  $p_s < .02$ . Controlling for population density did not affect the regional differences in prevalence of the top boys' name,  $F(1, 4) = 18.90, p < .02$ , or of the top 10 boys' names,  $F(1,4) = 61.49, p = .001$ ; however, it eliminated the effect of region on the top girl's name and the top 10 girls' names,  $F_s < .02, p_s > .90$

### Study 3

Study 1 and Study 2 provided evidence that regional variation in choosing a popular or relatively uncommon name corresponds to the history of settlement within

both the United States and Canada. Would corresponding differences be observed when European countries are compared with countries founded by European immigrants? Study 3 addressed this question. We predicted that a smaller percentage of babies would be given popular names in countries with a history of voluntary settlement by Europeans than in the European countries where those settlers originated. We also sought to test whether the naming practices were correlated with Hofstede's Individualism scores (Hofstede, Hofstede, & Minkov, 2010). In addition, we examined the strength of the relationship between voluntary settlement and naming practices when controlling for other dimensions of cross-cultural difference that have been linked to cross-national differences in independence.

### *Method*

We gathered data on names and live births for 2007 for nine European countries (Austria, Denmark, England, Hungary, Ireland, Norway, Scotland, Spain, and Sweden) and four frontier countries (Australia, Canada, New Zealand, and the United States; see Supplementary Information in Appendix A for a complete list of data sources). For Australia and Canada, we aggregated the available territory- and province- level data. We calculated the percentages of the four naming variables for each European country and for each frontier country.

### *Results*

Consistent with our predictions, our results showed that popular names were relatively less common in the frontier countries than in the European countries (see Table 4.4 for data by country). A one-way ANOVA comparing the two regions (Region 1 = European countries, Region 2 = frontier countries) found that a smaller percentage of

babies were given the most popular boy's name,  $F(1, 11) = 11.63, p = .006, d = 2.31$ , or the most popular girl's name,  $F(1, 11) = 6.59, p = .03, d = 1.80$ , in the frontier countries than in European countries. We found the same pattern for the percentage of babies given 1 of the 10 most popular boys' names,  $F(1, 11) = 18.43, p = .001, d = 2.97$ , or 1 of the 10 most popular girls' names,  $F(1, 11) = 18.97, p = .001, d = 3.05$ .

We next examined the correlation between countries' scores on Hofstede's Individualism dimension and the percentage of newborns who received popular names in those countries. All four measures of the percentage of babies who received popular names were highly negatively correlated with country-level Individualism scores,  $r_s < -.69, p_s < .01$ ; this suggests that naming practices are a valid index of independence (see Figs. 4.3a and 4.3b and Table 4.5). Individualism scores remained a strong predictor of naming practices even when we simultaneously controlled for gross domestic product (GDP) per capita, population density, and historical pathogen prevalence,  $\beta_s < -0.69, p_s < .005$ .

In order to assess the effect of settlement history, we ran a series of regressions with voluntary settlement dummy-coded and entered both alone and simultaneously with three other predictors: population density per square kilometer, GDP per capita, and countries' scores on Murray and Schaller's (2010) nine-item index of historical pathogen prevalence. We added historical pathogen prevalence because countries with histories of greater disease prevalence also tend to be more collectivistic and less individualistic (Fincher et al., 2008; Murray & Schaller, 2010). The effect of voluntary settlement remained significant for all four naming variables when we simultaneously controlled for these three other variables ( $\beta_s \leq -0.68, p_s \leq .02$ ). This result suggests that settlement

history has an effect on naming practices above and beyond the effects of several other variables that have been linked to cross-national variation in individualism (see Table 4.6).

### General Discussion

In three studies, we found that regional variations in baby naming corresponded to differences in those regions' history of settlement. People are more likely to choose a relatively popular name in regions with a longer history of settlement, and people in regions that were more recently settled are more likely to choose a relatively uncommon name. This phenomenon is evident not only within the United States (Study 1), but also in Canada (Study 2), and was also found in a cross-national comparison involving European countries and countries founded by European settlers (Study 3). This regional variation in naming practices is robustly predicted by the corresponding variation in individualism when controlling for a number of demographic factors.

We should also note that across the three studies, boys were somewhat more likely to receive popular names than girls were. The gender effect, however, did not depend on whether or not a region was a frontier. We suspect that the gender effect might reflect parental expectations. In particular, our conjecture is that parents might wish their baby girls to be unique and independent relative to their baby boys. This may be in part because parents are well aware that their girls are likely to be subject to more stringent gender-based societal rules than boys are as they grow (Cross & Madson, 1997).

Our work is the first that clearly shows the significant influence of frontier settlement, in multiple cases, on a common behavioral measure of independence that has obvious ecological and cultural validity. We believe that harsh, sparsely populated, and



socially mobile frontier conditions foster values of independence, and that, as a consequence, behaviors that are guided by these values are more common in frontier than in nonfrontier regions. Such behaviors are likely to be incorporated into the regional cultural ethos, and, as a consequence, they may be transmitted across generations even when the geographic frontiers have long since disappeared. The study of regional variation, then, may afford a significant opportunity for further explorations into cultural change and the transmission of cultural values and practices.

## Footnotes

1. A preliminary investigation also revealed that people with relatively popular names for their birth year appear less likely to endorse independent values. In a reanalysis of data collected as part of the Michigan Wisdom Project (Grossmann et al., 2010), we found that people given one of the top 10 names nationally in their birth year scored lower on an adapted version of Singelis' (1994) independence subscale,  $F(1,184) = 9.77, p = .002$ . The results held when adding ethnicity as a covariate,  $F(1,182) = 9.40, p = .022$ , and when looking only at European-Americans,  $F(1,145) = 3.11, p = .08$ .

Table 4.1. Percent of babies born in 2007 with popular names by State

<b>State</b>	<b>% given most popular boys' name</b>	<b>% given most popular girls' name</b>	<b>% given one of 10 most popular boys' names</b>	<b>% given one of 10 most popular girls' names</b>
<b>New England</b>				
Connecticut	1.52	1.23	12.69	10.16
Maine	1.54	1.57	12.11	12.10
Massachusetts	1.44	1.36	12.61	10.47
N. Hampshire	1.75	1.51	13.24	11.90
Rhode Island	1.52	1.32	15.68	15.19
Vermont	1.54	1.63	10.62	12.04
Mean (SD)	1.56 (.10)	1.47 (.15)	12.42(.97)	11.40 (.85)
<b>Mountain West &amp; Pacific Northwest</b>				
Colorado	.99	.92	8.77	8.59
Idaho	1.07	1.10	8.23	7.48
Montana	1.09	1.06	8.60	7.78
Nevada	1.22	.77	10.08	6.53
Oregon	1.03	.99	9.01	8.23
Utah	1.26	.92	9.24	7.70
Washington	1.13	.97	8.84	8.07
Wyoming	.94	.91	8.20	6.82
Mean (SD)	1.09 (.11)	.96 (.09)	8.87 (.60)	7.49 (.59)

Table 4.2. Effect of voluntary settlement and other factors on naming practices in 50 US States (standardized beta's)

	% with Most Popular Boys' Name	% with Most Popular Girls' Name	% with Top 10 Boys' Name	% with Top 10 Girls' Name
<b>Model 1</b>				
Date of Statehood	-.52***	-.45***	-.60***	-.44***
<b>Model 2</b>				
Date of Statehood	-.39*	-.37*	-.39**	-.39*
Population density <sup>1</sup>	.28	.18	.41*	.11
Median income <sup>2</sup>	-.20	-.32*	-.07	-.11

† =  $p < .1$ , \* =  $p < .05$ , \*\* =  $p < .01$ , \*\*\* =  $p < .005$

Note: The table reports standardized regression coefficients. Data for population density per square mile for 2007 were obtained from the U.S. Census Bureau's (2008) *Statistical Abstract of the United States, 2007*. Median-income data were obtained from the U.S. Census Bureau's (2007) American Community Survey.

Table 4.3. Percent of babies born in Canada with popular names in 2007 by Province (where data is available)

<b>Province</b>	<b>% given most popular boys' name</b>	<b>% given most popular girls' name</b>	<b>% given top 10 boys' name</b>	<b>% given top 10 girls' name</b>
<b>Eastern Provinces</b>				
Nova Scotia	1.86	1.91	12.95	13.66
Ontario <sup>1</sup>	1.82	2.01	14.46	11.32
Quebec	2.05	1.10	17.53	8.83
Mean (SD)	1.91 (.12)	1.67 (.50)	14.98 (2.33)	11.27 (2.42)
<b>Western Provinces</b>				
Alberta	1.54	1.01	9.48	8.20
British Columbia	1.34	1.08	9.98	8.75
Manitoba	1.55	1.11	9.48	7.90
Saskatchewan	1.36	1.47	8.99	8.79
Mean (SD)	1.45 (.11)	1.17 (.21)	9.48 (.40)	8.41 (.43)

<sup>1</sup>Data from 2003

Table 4.4. Percent of babies born in with popular names in 2007 by country

Country	% given most popular boys' name	% given most popular girls' name	% given top 10 boys' name	% given top 10 girls' name
<b>Europe</b>				
Austria	2.97	2.51	20.31	19.41
Denmark	2.58	2.33	23.14	20.31
England&Wales	2.20	1.44	16.83	14.66
Hungary	3.49	2.90	26.67	20.21
Ireland	3.01	1.87	19.88	14.92
Norway	1.60	1.70	14.39	13.81
Scotland	2.38	2.12	15.81	14.41
Spain	3.21	3.90	23.73	23.79
Sweden	2.17	1.72	17.75	15.32
Mean (SD)	2.62 (.60)	2.28 (.76)	19.83 (4.07)	17.43 (3.56)
<b>Frontier</b>				
Australia <sup>1</sup>	1.71	1.37	12.87	10.80
Canada <sup>1,2</sup>	1.75	1.46	9.50	9.74
New Zealand	1.56	1.31	10.74	8.89
US	1.11	.89	9.41	7.78
Mean (SD)	1.53 (.29)	1.26 (.25)	10.63 (1.61)	9.30 (1.28)

<sup>1</sup>Data aggregated from available Province/Territory level data, <sup>2</sup>Includes Ontario data from 2003

Table 4.5. Country level correlations between naming practices and Hofstede individualism scores

	% with Most Popular Boys' Name	% with Most Popular Girls' Name	% with Top 10 Boys' Name	% with Top 10 Girls' Name
Individualism Score	-.75***	-.82***	-.74***	-.78***

\* =  $p < .05$ , \*\* =  $p < .01$ , \*\*\* =  $p < .005$

Table 4.6. Study 3: Effect of voluntary settlement and other factors on naming practices (standardized beta's)

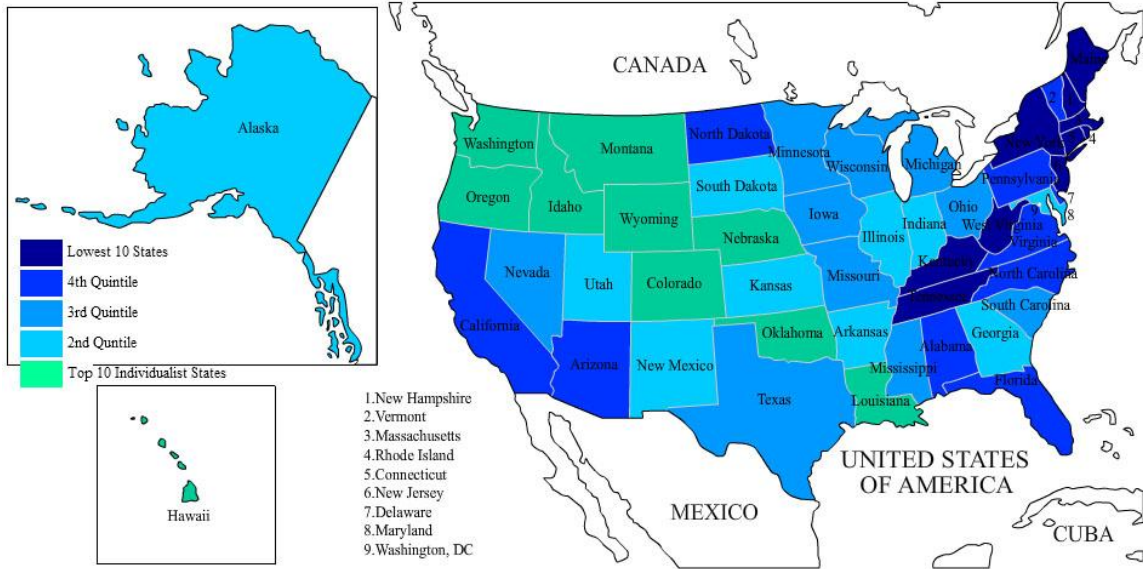
	% with Most Popular Boys' Name	% with Most Popular Girls' Name	% with Top 10 Boys' Name	% with Top 10 Girls' Name
Model 1				
Voluntary settlement	-.72**	-.61*	-.79***	-.80***
Model 2				
Voluntary settlement	-.77**	-.68*	-.89***	-.85***
Population density <sup>1</sup>	.08	-.12	-.16	-.10
GDP per capita <sup>2</sup>	-.52*	-.49*	-.48***	-.38*
Pathogen prevalence <sup>3</sup>	.26	.37	.24†	.29†

† =  $p < .1$ , \* =  $p < .05$ , \*\* =  $p < .01$ , \*\*\* =  $p < .005$

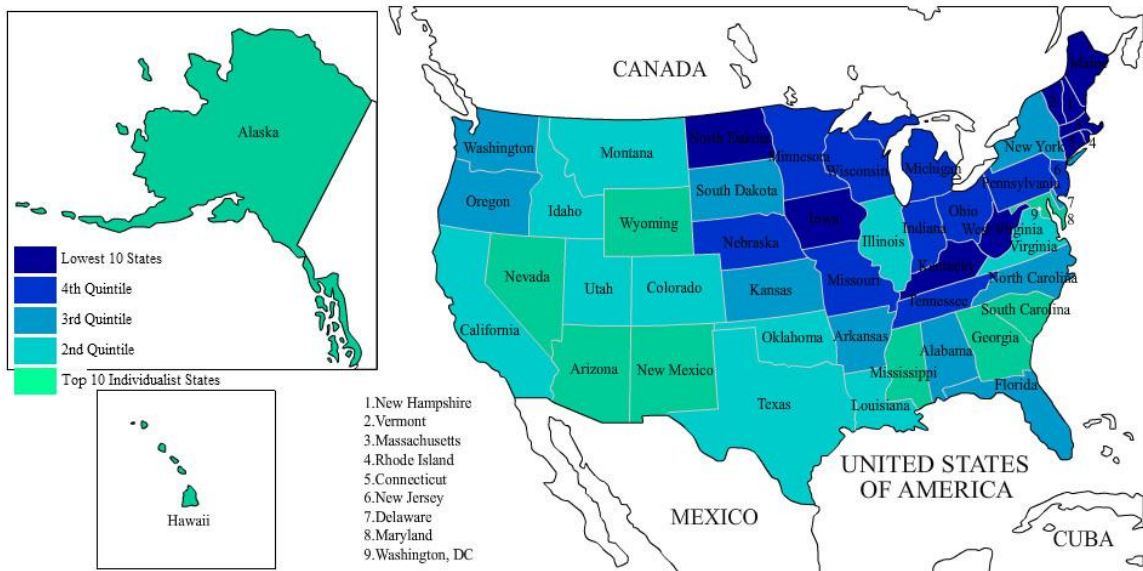
Note: The table reports standardized regression coefficients. Data for population density per square kilometer were taken from the European Commission (n.d.) Eurostat and the United Nations *Demographic Yearbook* (United Nations Statistics Division, 2007). Data for gross domestic product (GDP) per capita were taken from the data for 2007 in *Human Development Indices: A Statistical Update 2009* (United Nations Statistics Division, 2009). Data for pathogen prevalence were taken from Murray and Schaller's (2010) historical pathogen prevalence index.



Figure 4.1 Relative frequency of popular names in the United States (Study 1). States were grouped by quintile according to the percentage of babies given any of the 10 most popular names in their state. Results are shown for (a) boys and (b) girls.

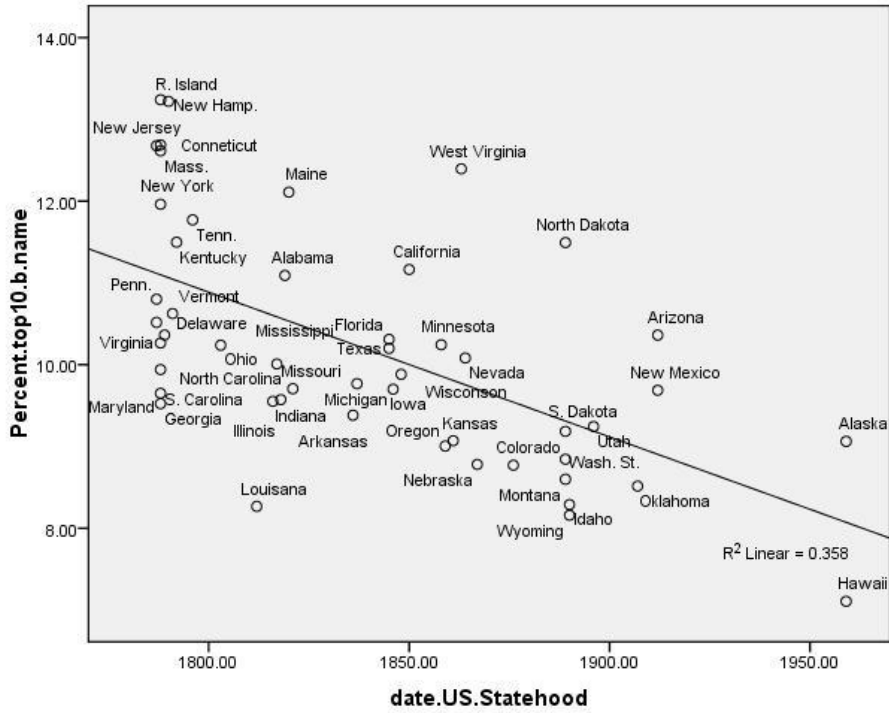


a.

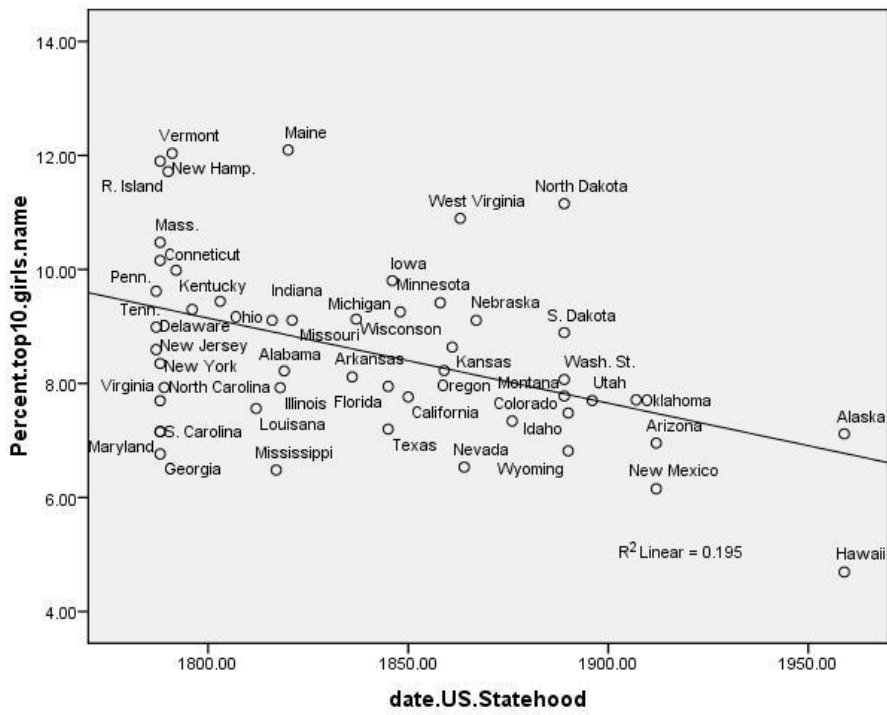


b.

Figure 4.2. Correlation between the date on which U.S. statehood was granted and the percentage of babies given any of the 10 most popular names in their respective state (Study 1). Scatter plots (with best-fitting regression lines) show results for (a) boys and (b) girls.

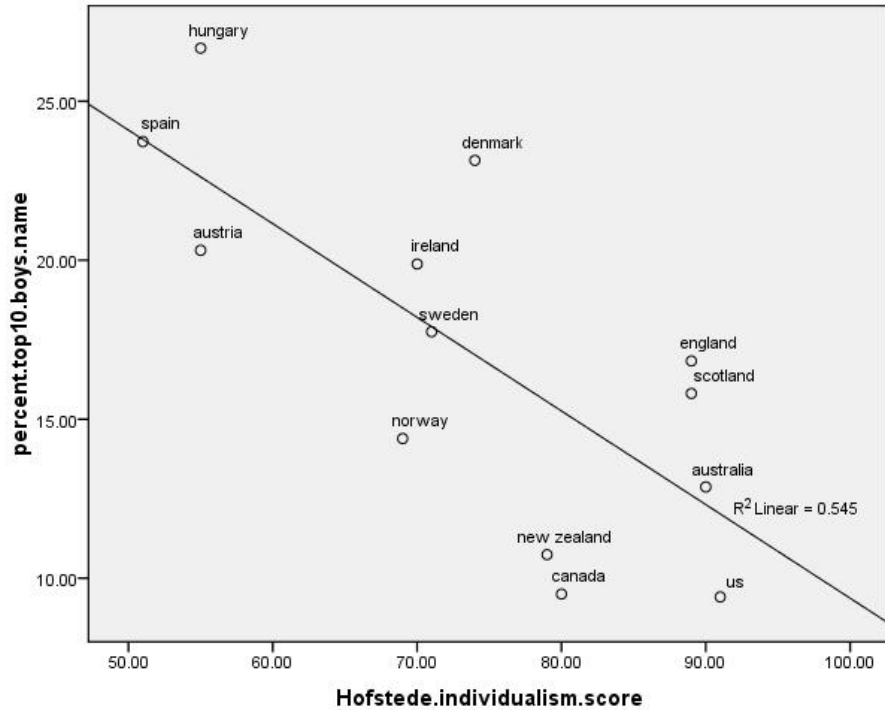


a.

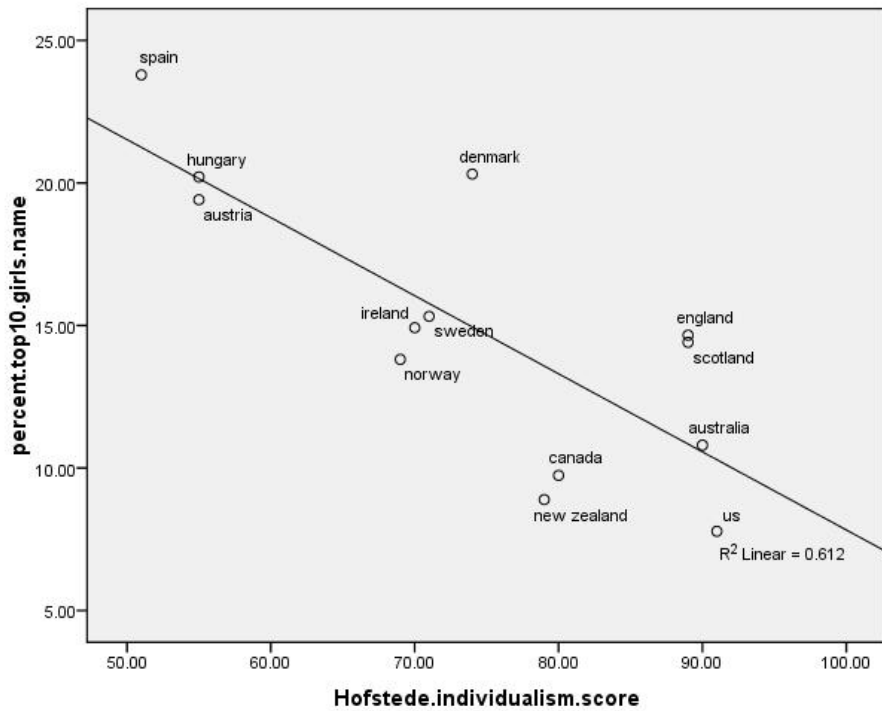


b.

Figure 4.3. Correlation between Hofstede Individualism score (Hofstede, Hofstede, & Minkov, 2010) and the percentage of babies given any of the 10 most popular names in their respective country (Study 3). Scatter plots (with best-fitting regression lines) show results for (a) boys and (b) girls.



a.



b.

## Appendix A. Supplemental Material

### Supplementary Analyses

In Study 1, one potential confound is that Hispanic parents may be less likely to give their children one of the most popular names in their State. In order to control for this possibility we used data from the US Census Statistical Abstract to calculate the percent of Hispanic births in each state in 2007. Overall the Frontier States appear to have had a greater percentage of Hispanic births than the New England States, however this difference was not statistically significant,  $F(1,12) = 2.61, p = ns$ . Importantly, however, controlling for the percent of Hispanic births did not affect the results (in terms of regional differences in naming), all  $F$ 's  $> 50, p$ 's  $< .001$ . It is also of note that the results remained unaffected by controlling for the percent of African-American births, all  $F$ 's  $> 50, p$ 's  $< .001$ , or the percent of Asian-American and Pacific Islander births, all  $F$ 's  $> 50, p$ 's  $< .001$ .

In a separate analysis we found that year of Statehood remained a significant predictor of naming practices when controlling for percentage of Caucasians per State,  $\beta$ 's  $< -.42, p$ 's  $< .001$ , suggesting that these findings cannot be accounted for by differences in ethnic composition.

### Study 2 data sources

Data for Nova Scotia came from the Vital Statistics Division of Service Nova Scotia and Municipal Relations (<http://www.gov.ns.ca/snsmr/pdf/ans-vstat-2007-annual-report.pdf>), data for Ontario came from Data Services, Service Ontario (report provided upon personal request), data for Quebec came from Regie de rentes Quebec ([http://www.rrq.gouv.qc.ca/Interactif/PR2I121\\_Prenoms/PR2I121\\_Prenoms/PR2SPreno](http://www.rrq.gouv.qc.ca/Interactif/PR2I121_Prenoms/PR2I121_Prenoms/PR2SPreno)

[ms\\_01.aspx](#)), data for Alberta came from the Government of Alberta, Service Alberta (<http://www.servicealberta.ca/1163.cfm>), data for British Columbia came from the British Columbia Ministry of Health's Vital Statistics Agency, (<http://www.vs.gov.bc.ca/babynames/index.html>), data for Manitoba came from the Manitoba Vital Statistics Agency ([http://vitalstats.gov.mb.ca/pdf/2008\\_VS\\_Annual\\_Report\\_en.pdf](http://vitalstats.gov.mb.ca/pdf/2008_VS_Annual_Report_en.pdf)), and data for Saskatchewan came from the Saskatchewan Information Services Corporation (<http://www.isc.ca/VitalStats/Births/Baby%20Names/Pages/from2007.aspx>).

Data on population density by province was calculated using data on land area, population per province, and projected population growth from Statistics Canada (<http://www40.statcan.gc.ca/101/cst01/phys01-eng.htm?sdi=area>), (<http://www.statcan.gc.ca/pub/91-002-x/2008004/t002-eng.htm>), (<http://www.statcan.gc.ca/pub/91-002-x/2008004/t009-eng.htm>), and Wikipedia, ([http://en.wikipedia.org/wiki/List\\_of\\_Canadian\\_provinces\\_and\\_territories\\_by\\_population](http://en.wikipedia.org/wiki/List_of_Canadian_provinces_and_territories_by_population)).

### Study 3 data sources

Data for Austria came from Statistics Austria ([http://www.statistik.at/web\\_de/static/vornamen\\_der\\_neugeborenen\\_mit\\_oesterreichischer\\_staatsbuergerschaft\\_nach\\_f\\_021130.pdf](http://www.statistik.at/web_de/static/vornamen_der_neugeborenen_mit_oesterreichischer_staatsbuergerschaft_nach_f_021130.pdf)), data from Denmark came from Statistics Denmark (<http://www.dst.dk/Statistik/Navne/NamesPop.aspx?period=20072>), data for England and Wales came from the UK Office for National Statistics ([http://www.statistics.gov.uk/downloads/theme\\_population/2007-Boys-Ranking.xls](http://www.statistics.gov.uk/downloads/theme_population/2007-Boys-Ranking.xls)), data

for Hungary came from the Hungarian Statistical Office ([http://portal.ksh.hu/pls/ksh/docs/eng/xstadat/xstadat\\_annual/tab16\\_01\\_04ie.html#](http://portal.ksh.hu/pls/ksh/docs/eng/xstadat/xstadat_annual/tab16_01_04ie.html#)) and [www.babynamestats.com](http://www.babynamestats.com) (<http://www.babynamestats.com/hungarian-top100-2007.html>), data for Ireland came from the Central Statistics Office of Ireland ([http://www.cso.ie/statistics/top\\_babies\\_names.htm](http://www.cso.ie/statistics/top_babies_names.htm)), data for Norway came from Statistics Norway ([http://www.ssb.no/navn\\_en/](http://www.ssb.no/navn_en/)), data for Scotland came from the General Register Office for Scotland (<http://www.gro-scotland.gov.uk/files1/stats/the-most-popular-names-in-scotland-2007/j922202.htm>), data for Spain came from the Institute Nacional de Estadística ([http://www.ine.es/en/daco/daco42/nombyapel/nombyapel\\_en.htm](http://www.ine.es/en/daco/daco42/nombyapel/nombyapel_en.htm)), and Sweden came from Statistics Sweden ([http://www.scb.se/Pages/TableAndChart\\_225615.aspx](http://www.scb.se/Pages/TableAndChart_225615.aspx), [http://www.scb.se/Pages/TableAndChart\\_225613.aspx](http://www.scb.se/Pages/TableAndChart_225613.aspx)). Data for Australia came from the Australian Bureau of Statistics (<http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3301.02007>) and the responsible authorities for each province for which data was available. Data for New South Wales came from the New South Wales Government Registry of Births, Deaths, & Marriages (<http://www.bdm.nsw.gov.au/cgi-bin/popularNames.cgi>, <http://www.bdm.nsw.gov.au/birthsStatistics.htm>), data for Queensland came from the Queensland Registry of Births, Deaths, & Marriages (<http://www.justice.qld.gov.au/justice-services/births-deaths-and-marriages/births/popular-baby-names>), data for Southern Australia came from the Government of Southern Australia's Office of Consumer and Business Affairs

(<http://www.ocba.sa.gov.au/bdm/babynames.html>), data for Victoria came from the Victorian Registry of Births, Deaths, & Marriages (<https://online.justice.vic.gov.au/bdm/popular-names>), and data for Western Australia and the Northern Territory came from [www.babynamstats.com](http://www.babynamstats.com) ([http://www.babynamstats.com/popular\\_names\\_australia\\_2007.html](http://www.babynamstats.com/popular_names_australia_2007.html), [http://www.babynamstats.com/popular\\_names\\_australia\\_2007.html](http://www.babynamstats.com/popular_names_australia_2007.html)). Data for Canada came from the relevant Provincial governments (see Study 2). Data for New Zealand came from the New Zealand Department of Internal Affairs ([http://www.dia.govt.nz/diawebsite.nsf/wpg\\_URL/Services-Births-Deaths-and-Marriages-Most-Popular-Male-and-Female-First-Names?OpenDocument](http://www.dia.govt.nz/diawebsite.nsf/wpg_URL/Services-Births-Deaths-and-Marriages-Most-Popular-Male-and-Female-First-Names?OpenDocument), <http://www.stats.govt.nz/publications/populationstatistics/demographic-trends-2009.aspx>), the US data came from the Social Security Administration and the Census Bureau (see Study 1).

## References

- Alter, A. (2007, June 22). The baby-name business. *The Wall Street Journal*, p. W1.
- Christenfeld, N., & Larsen, B. (2008). The name game. *The Psychologist*, 21, 210–213.
- Cross, S.E., & Madson, L. (1997). Models of the self: Self-construals and gender. *Psychological Bulletin*, 122, 5–37.
- European Commission. (n.d.). Population density table. In *Euro-stat*. Retrieved from [http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tps\\_00003&plugin=1](http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tps_00003&plugin=1)
- Fincher, C.L., Thornhill, R., Murray, D.R., & Schaller, M. (2008). Pathogen prevalence predicts human cross-cultural variability in individualism/collectivism. *Proceedings of the Royal Society B: Biological Sciences*, 275, 1279–1285.
- Grossmann, I., Na, J., Varnum, M.E.W., Park, D.C., Kitayama, S., & Nisbett, R.E. (2010). Reasoning about social conflicts improves into old age. *Proceedings of the National Academy of Sciences of the USA*, 107, 7246–7250.
- Hofstede, G., Hofstede, J.H., & Minkov, M. (2010). *Cultures and organizations: Software of the mind* (3rd ed.). New York, NY: McGraw-Hill.
- Jokela, M. (2009). Personality predicts migration within and between U.S. states. *Journal of Research in Personality*, 43, 79–83.
- Kitayama, S., Conway, J. G., Pietromonaco, P.B., Park, H., & Plaut, V.C. (2010). Ethos of independence across regions of the United States: The production-adoption model of cultural change. *American Psychologist*, 65, 559–574.
- Kitayama, S., Ishii, K., Imada, T., Takemura, K., & Ramaswamy, J. (2006). Voluntary settlement and the spirit of independence: Evidence from Japan's "northern frontier." *Journal of Personality and Social Psychology*, 91, 369–384.
- Kitayama, S., Park, H., Sevincer, A.T., Karasawa, M., & Uskul, A.K. (2009). A cultural task analysis of implicit independence: Comparing North America, Western Europe, and East Asia. *Journal of Personality and Social Psychology*, 97, 236–255.
- Liebersen, S., & Bell, E.O. (1992). Children's first names: An empirical study of social taste. *American Journal of Sociology*, 98, 511–554.
- Murray, D.R., & Schaller, M. (2010). Historical prevalence of infectious diseases within 230 geopolitical regions: A tool for investigating the origins of culture. *Journal of Cross-Cultural Psychology*, 4, 99–108.
- Oishi, S., Lun, J., & Sherman, G.D. (2007). Residential mobility, self-concept, and positive affect in social interactions. *Journal of Personality and Social Psychology*, 93, 831–844.
- Park, H., Conway, L.G., Pietromonaco, P.R., Plaut, V.C., & Kitayama, S. (2009). *A paradox of American individualism: Regions vary in explicit, but not implicit, independence*. Unpublished manuscript, Hokkaido University, Hokkaido, Japan.
- Plaut, V.C., Markus, H.R., & Lachman, M.E. (2002). Place matters: Consensual features and regional variation in American well-being and self. *Journal of Personality and Social Psychology*, 83, 160–184.
- Singelis, T. M. (1994). The measurement of independent and interdependent self-construals. *Personality and Social Psychological Bulletin*, 20, 580–591.



- Social Security Administration. (2010). *Popular names*. Retrieved from <http://www.ssa.gov/OACT/babynames/state/index.html>
- Twenge, J.M., Abebe, E.M., & Campbell, W.K. (2010). Fitting in or standing out: Trends in American parents' choices for children's names, 1880–2007. *Social Psychological & Personality Science*, 1, 19–25.
- United Nations Statistics Division. (2007). Table 3. In *Demographic yearbook* (p. 58). New York, NY: United Nations Publications Board.
- United Nations Statistics Division. (2009). *Human development indices: A statistical update 2009*. Retrieved from <http://data.un.org/DocumentData.aspx?q=GDP+per+capita&id=185>
- U.S. Census Bureau. (2007). Median household income. In *American community survey*. Retrieved from [http://factfinder.census.gov/servlet/GRTTable?\\_bm=y&-box\\_head\\_nbr=R1901&-ds\\_name=ACS\\_2007\\_1YR\\_G00\\_&-\\_lang=en&-format=US-30&-CONTEXT=grt](http://factfinder.census.gov/servlet/GRTTable?_bm=y&-box_head_nbr=R1901&-ds_name=ACS_2007_1YR_G00_&-_lang=en&-format=US-30&-CONTEXT=grt)
- U.S. Census Bureau. (2008). *Statistical abstract of the United States, 2007*. Washington, DC: Government Printing Office.
- Uskul, A.K., Kitayama, S., & Nisbett, R.E. (2008). Ecocultural basis of cognition: Farmers and fishermen are more holistic than herders. *Proceedings of the National Academy of Sciences, USA*, 105, 8552–8556.
- Vandello, J., & Cohen, D. (1999). Patterns of individualism and collectivism across the United States. *Journal of Personality and Social Psychology*, 77, 279–292.

## Chapter 5:

### Conclusion

In this chapter I will summarize the major findings of Chapters 2-4 and discuss their theoretical implications. I will also explore some practical implications of these findings for fields such as education, marketing, and persuasive campaigns designed to influence behavior. I will also discuss future research directions based on the present findings.

#### Summary of Major Findings

Chapter 2 explored the effects of social class as well as larger cultural context on analytic vs. holistic cognitive habits and on views of the self. In these studies we examined whether social class has a similar effect to culture on these variables, and whether this effect varied as a function of the predominance of independence or interdependence in the culture at large. For all 4 variables (attribution, visual attention, change prediction, and symbolic self-inflation) social class had a similar effect to culture. People from working-class backgrounds placed more weight on contextual factors when reasoning about the causes of others' behavior, showed more contextual patterns of visual attention, predicted that events were more likely to develop in a dialectical fashion, and demonstrated less inflated views of the self compared to people from middle-class backgrounds. These effects were parallel to and independent of the effect of culture. Consistent with the idea that differences in views of the self drive differences in cognitive

habits, both the social class differences and the cultural differences in cognition observed in Study 2 were mediated by symbolic views of the self.

Using ERP's, Chapter 3 sought to test whether social class differences in causal inference were the result of differences in automatic person perception or from deliberate, late stage correction for dispositional bias as might be suggested by Gilbert and Malone's (1995) 2-stage model. Here too social class differences in cognition appear to arise from similar sources as cultural differences. Similar to the finding that Asian-Americans do not appear to engage in spontaneous trait inference (Na & Kitayama, in press), people from working-class backgrounds also did not show evidence of this automatic dispositional bias. This study suggests that social class differences in causal inference, like cultural differences, have fairly deep neural roots.

Chapter 4 examined the effect of voluntary settlement on the choice of relatively popular vs. relatively unique names for children. Study 1 found that regions of the US which were more recently settled (such as the Pacific Northwest and the Mountain West) have a lower prevalence of children receiving names popular in their respective state than do regions of the US with a longer history of settlement (such as New England). Further, we observed a strong negative correlation between the prevalence of popular names and the date at which a state was admitted to the Union, which held controlling for a number of demographic variables. In Study 2 the same pattern was observed when comparing western and eastern Canadian provinces. Study compared the prevalence of popular names in countries that were relatively recently settled by Europeans (the US, Canada, Australia, and New Zealand) and in European countries (including the England, Scotland, Ireland, Spain, and Sweden). The difference between these two groups of countries

remained significant controlling for other factors (such as GDP, population density, and historical pathogen prevalence) which have previously been invoked to explain cross-national differences in independence-interdependence. In addition, national prevalence of popular names was strongly negatively correlated with country-level scores on Hofstede's (2010) individualism dimension (a relationship which held controlling for a variety of demographic variables). These findings suggest that the settling of frontiers may in part explain both contemporary patterns of cross-cultural differences in independence and regional differences within countries.

### Implications for Cultural Psychology

These findings have a number of implications for cultural psychology, the most obvious being that within-culture factors (such as social class and region) can have effects that are parallel to those of broader cultural context and that the mechanisms which lead to cross-cultural differences may also lead to within-culture differences. Social class differences in cognitive habits, like cultural differences, are mediated by differences in views of the self (Chapter 2). Class-based differences in causal inference, like cultural differences, appear to stem from automatic neural processes rather than deliberate, late-stage correction for initial automatic dispositional inference (Chapter 3). And regional variations within countries in behavior reflecting a preference for uniqueness, like variation between countries, are linked to settlement history (Chapter 4). However, it is worth noting that mechanisms underlying between and within culture differences are not always the same. For example, while both class and cultural differences in attribution arise from differences in automatic as opposed to controlled

processes, class differences were not mediated by self-construal (as was the case in Na and Kitayama, in press).

Another fairly basic implication of these within-culture studies is that when conducting cross-cultural research, it is important for investigators to take into account the distribution of social class within their samples and the history of the specific subcultural region from which their samples are drawn. It may be both safest and most informative to collect data from people in multiple regions and of differing social class when conducting cross-cultural studies. It may also be especially important to do so when conducting research in societies where little cultural psychology has taken place. On a related note, the growing body of literature on within-culture variation should lead cultural psychologists to be cautious in generalizing their findings to larger cultural groups based on fairly homogenous student samples.

This work also has deeper implications for the psychological study of culture. It is worth noting that the operationalization of social class in Chapters 2 and 3 was based on parental education. The fact that differences were observed among students at the same universities suggests that the effects of early socialization and the cross-generational transmission of values are highly persistent, even when one is immersed in a context shaped by different values. This occurs even though the group difference in question is not one that is obviously marked by skin color or language. This may imply that the differences which have been frequently observed in the cultural psychology literature between Asian-American and European-Americans are due more to the transmission of cultural values and ways of thinking than to stereotypes and self-fulfilling prophecy.

The findings in Chapter 4 provide support for the idea that distal historical factors (i.e. Cohen et al., 1996; Nisbett, 2003) may indeed have contemporary psychological consequences. The origins of American individualism may be due to a host of factors related to the settling of frontiers, including self-selection and environments which rewarded self-reliance and independence. The persistence of these differences in the present day suggests that a contemporary cultural ethos may continue to transmit and reinforce regional and national variations in values and views of the self, long after the environmental factors which gave rise to such differences have ceased to be relevant.

### Practical Implications

Regional and social class variations in social orientation and cognitive style have a number of real world implications for areas ranging from education to persuasion. For example, Western educational settings tend to promote analytic thinking (Ventura et al., 2008). This may place those from working-class backgrounds at a disadvantage as their habitual ways of thinking emphasize holism and context. Given this difference, it may be advisable to explicitly emphasize and teach analytic ways of viewing the world to working-class children, or to adjust academic curricula to reflect both holistic and analytic modes of thought.

The fact that working-class people and those from regions that were less recently frontiers have a more interdependent social orientation also might inform advertising targeted at these groups. Indeed there is some evidence that working-class people show less preference for products that express uniqueness and greater preference for those which are perceived as popular (Stephens, Markus, & Townsend, 2007). Further, it seems likely that working-class people would prefer products that reflect interdependent values.

To some extent marketers appear to be aware of these differences; ads aimed at working-class audiences tend to differ from those aimed at middle-class audience in terms of how products are framed (connecting to others vs. distinguishing the self from others; Stephens, Markus, & Townsend, 2007). Given the findings in Chapter 4, it may also be useful for advertisers to take into account regional variations in preference for uniqueness in order to most effectively sell their products.

Public service campaigns may also be informed by regional and social class variations in independence-interdependence. A recent paper by Hamedani and colleagues (in press) finds that European-Americans prefer products that are framed in as reflecting independence and are more motivated to action in general by messages framed independently (as opposed to interdependently). It may also be that these types of frames are more effective for middle-class people and those living in the western US than working-class people or those from Eastern states. Similarly, appeals based on descriptive norms (Cialdini, Reno, & Kallgren, 1990) may be more persuasive to working-class people and those from Eastern states.

Regional differences in social orientation also have somewhat counterintuitive implications for political campaigns. Ads emphasizing a candidates self-reliance may be more effective in more recently settled areas of the US (perhaps including the so-called “Heartland” which was more recently a frontier), whereas ads emphasizing a candidates close ties to family and involvement in the community might be more effective in areas like the middle and upper East Coast.

#### Future Directions

As cultural psychologists become increasingly interested in factors like social class and region, it will be important to continue to combine between and within culture approaches. It will also be important, when these factors appear to have the same type of effects, to explore the mechanisms that underlie both cultural and within-culture differences.

Although the present set of studies contribute to our understanding of the importance of within-culture factors in cultural psychology (and their relation to cross-cultural differences), a number of important questions remain to be answered. This research also suggests a number of promising lines of future inquiry. I will begin by discussing questions and potential future research that build most directly on the studies that comprise this dissertation, and I will conclude by discussing other questions which may be informed by the present work.

One alternative interpretation of the present data is worth noting. It may be that differences in relational mobility (for a review see, Schug, Yuki, Horikawa, & Takemura, 2009) underlie social class and regional differences. It may be for example that working-class people are more interdependent because they have less relational mobility and thus are obligated to forge closer relationships. It may also be that those who settle frontiers do so because they feel less closely bound by relationships and are thus more willing to go to frontiers. Frontiers also might continue to attract people who are less closely bound in relationships. Future research may seek to measure relational mobility as it may be an important mediator of with-culture effects.

In terms of social class, as noted before in this Chapter, parental education is linked to differences in social orientation and cognitive habits among university students.



Given that previous work has found analogous differences as a function of people's own level of education among an adult sample of non-students (Na et al., 2010) it may be interesting to assess when a person's own social class status as opposed to their background becomes more important in determining their levels of independence-interdependence and analytic vs. holistic cognitive habits. It may also be informative to assess the relative contribution of parental vs. own educational attainment among a non-student sample.

With regard to regional variation stemming from voluntary settlement, one question which remains to be answered regarding the role of settlement history on contemporary values and practices has to do with the issue of self-selection and potentially social and sexual selection. As research in behavioral genetics has progressed, genotypes that affect the production and reception of dopamine have been linked to personality traits, such as risk taking (Kreek, Nielsen, Butleman, & LaForge, 2005), impulsivity (Kreek et al., 2005) and novelty seeking (Schinka, Letsch, & Crawford, 2002) which seem likely to be selected for in frontier environments. It will be interesting to see if the dopamineuragic genotypes associated with these traits differ in their distribution as function of voluntary settlement.

Another question related to voluntary settlement has to do with which aspects of social orientation and cognition are affected. When comparing Hokkaido (a recent frontier) with the rest of Japan, Kitayama and colleagues (2006) found differences in implicit views of the self and patterns of emotional experience. However, a similar study comparing frontier vs. non-frontier regions of the US did not find differences in implicit measures of the self or cognition, but did find difference in explicit values (Park et al.,

2009). A more systematic study of regional variation in both implicit and explicit measures related to the self may help to clarify these findings. It may be that the ethos of the frontier has a greater impact on explicit values and behaviors that are expressive of them, but does not affect more implicit aspects of the self. More generally, it seems likely that while broader cultural milieu has a wide range of psychological consequences, subcultural variations may be more limited and domain specific.

It should be noted that none of the studies presented in this dissertation manipulated the salience of within-culture identities. Future studies in which social class and regional identity are primed would help to confirm that these factors have a causal role in creating and maintaining the differences observed in Chapters 2-4. As people have a number of identities which may or may not be salient at a given moment, such manipulations may be a useful way to elicit different social orientations and modes of cognition.

Some identities, such as social class status, can be manipulated not only in terms of the salience of one's identity, but also its content. For example participants' subjective sense of social class is likely subject to manipulation by changing the reference group with whom participants compare the self. Future researchers might also attempt to manipulate subjective social class status to see how this affects a host of variables related to social orientation and cognitive habits.

Priming research might also shed light on the contribution of ideas evoked by the frontier mythos in producing and perpetuating contemporary regional and cross-national differences in social orientation. For example, images or stories evoking the idea of

frontier settlement, might lead to more independence not only among those from frontier regions or countries.

It would also be worthwhile to explore the consequences of the fit between people's social orientation and cognitive habits with those of their sub-cultural group for outcomes like subjective well-being, self-esteem, and depression. Recent work by Dressler and colleagues (2007; 2008) on what they describe as "cultural consonance" may be informative here. For example, Dressler (2007) finds that among a sample of Brazilians the fit between cultural norms regarding family life and one's actual family life predicted levels of depression. This may also hold true for consonance on other dimensions. For example, one might predict that those who are more culturally typical in terms of certain components of social orientation (such as values, self-views, and patterns of emotional experience) and/or cognitive habits (such as reasoning about others' behavior and about the unfolding of trends) might have higher levels of well-being. This might also be the case when looking at what one might term "sub-cultural consonance." Indeed, given the fact that people generally tend to make self-judgments based not on their evaluation of humanity at large or their society as a whole but on more proximal reference groups (Festinger, 1954; Hyman, 1942), it may be that sub-cultural consonance is a better predictor of outcomes like well-being and self-esteem than cultural consonance.

## References

- Cialdini, R.B., Reno, R.R., & Kallgren, C.A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology, 58*, 1015-1026.
- Cohen D., Nisbett R.E., Bowdle, B.F., Schwarz, N. (1996). Insult, aggression, and the Southern culture of honor: An “experimental ethnography.” *Journal of Personality and Social Psychology, 70*, 945–60.
- Dressler, W.W., Bailiero, M.C., Ribeiro, R.P., dos Santos, J.E. (2007). A prospective study of cultural consonance and depressive symptoms in urban Brazil. *Social Science & Medicine, 65*, 2058-2069.
- Dressler, W.W., Oths, K.S., Riberio, R.P., Baliero, M.C., & dos Santos, J.E. (2008). Cultural consonance and adult body composition in urban Brazil. *American Journal of Human Biology, 20*, 15-22.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7*, 117-140.
- Hamedani, M.G., Markus, H.R., & Fu, A.S. (in press). In the land of the free, Interdependent action undermines motivation. *Psychological Science*.
- Hofstede, G., Hofstede, J.H., & Minkov, M. (2010). *Cultures and organizations: Software of the mind* (3rd ed.). New York, NY: McGraw-Hill.
- Hyman, H. (1942). The psychology of subjective status. *Psychological Bulletin, 39*, 473-474.
- Kitayama, S., Ishii, K., Imada, T., Takemura, K., & Ramaswamy, J. (2006). Voluntary settlement and the spirit of independence: Evidence from Japan’s “Northern frontier.” *Journal of Personality and Social Psychology, 91*, 369–384.
- Kreek, M.J., Nielsen, D.A., Butelman, E.R., & LaForge, K.S. (2005). Genetic influences on impulsivity, risk taking, stress responsivity, and vulnerability to drug abuse and addiction. *Nature Neuroscience, 11*, 1450-1457.
- Na, J., Grossmann, I., Varnum, M.E.W., Kitayama, S., Gonzalez, R., & Nisbett, R.E. (2010). Cultural differences are not always reducible to individual differences. *Proceedings of the National Academy of Sciences of the USA, 107*, 6192-6197.
- Na, J., & Kitayama, S. (in press). Spontaneous trait inference is culture specific: Behavioral and neural evidence. *Psychological Science*.
- Nisbett, R. E. (2003). *The geography of thought: How Asians and Westerners think differently... and why*. New York: The Free Press.
- Park, H., Conway, L.G., Pietromonaco, P.R., Plaut, V.C., & Kitayama, S. (2009). A paradox of American individualism: Regions vary in explicit, but not implicit, independence. Unpublished manuscript, Hokkaido University, Hokkaido, Japan.
- Schinka, J.A., Letsch, E.A., & Crawford, F.C. (2002). DRD4 and novelty seeking: Results of meta-analyses. *American Journal of Medical Genetics, 114*, 643-648.
- Schug, J., Yuki, M., Horikawa, H., & Takemura, K. (2009). Similarity attraction and actually selecting similar others: How cross-societal differences in relational mobility affect interpersonal similarity in Japan and the USA. *Asian Journal of Social Psychology, 12*, 95–103.

Ventura, P., Pattamadilok, C., Fernandes, T., Klein, O., Morias, J., & Kolinsky, R. (2008). Schooling in western culture promotes context-free processing. *Journal of Experimental Child Psychology*, *100*, 79-88.