

# Culture and personality revisited: Behavioral profiles and within-person stability in interdependent (vs. independent) social orientation and holistic (vs. analytic) cognitive style

Jinkyung Na<sup>1</sup>  | Igor Grossmann<sup>2</sup> | Michael E. W. Varnum<sup>3</sup> | Mayumi Karasawa<sup>4</sup> | Youngwon Cho<sup>1</sup> | Shinobu Kitayama<sup>5</sup> | Richard E. Nisbett<sup>5</sup>

<sup>1</sup>Department of Psychology, Sogang University, Seoul, Korea

<sup>2</sup>Department of Psychology, University of Waterloo, Waterloo, ON, Canada

<sup>3</sup>Department of Psychology, Arizona State University, Tempe, Arizona

<sup>4</sup>Department of Communication, Tokyo Women's Christian University, Tokyo, Japan

<sup>5</sup>Department of Psychology, University of Michigan, Ann Arbor, Michigan

## Correspondence

Jinkyung Na, Department of Psychology, Sogang University, 35 Baekbeom-ro, Mapo-gu, Seoul 04107, Korea.  
Email: jinkyung@sogang.ac.kr

Igor Grossmann, Department of Psychology, University of Waterloo, 200 University Avenue West, Waterloo, ON, N2L 3G1, Canada.  
Email: igrossma@uwaterloo.ca

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## Abstract

**Objective:** We test the proposition that both social orientation and cognitive style are constructs consisting of loosely related attributes. Thus, measures of each construct should weakly correlate among themselves, forming intraindividually stable profiles across measures over time.

**Method:** Study 1 tested diverse samples of Americans ( $N = 233$ ) and Japanese ( $N = 433$ ) with a wide range of measures of social orientation and cognitive style to explore correlations among these measures in a cross-cultural context, using demographically heterogeneous samples. Study 2 recruited a new sample of 485 Americans and Canadians and examined their profiles on measures of social orientation and cognitive style twice, one month apart, to assess the stability of individual profiles using these variables.

**Results:** Despite finding typical cross-cultural differences, Study 1 demonstrated negligible correlations both among measures of social orientation and among measures of cognitive style. Study 2 demonstrated stable intraindividual behavioral profiles across measures capturing idiosyncratic patterns of social orientation and cognitive style, despite negligible correlations among the same measures.

**Conclusion:** The results provide support for the behavioral profile approach to conceptualizing social orientation and cognitive style, highlighting the need to assess intraindividual stability of psychological constructs in cross-cultural research.

## KEYWORDS

cognitive style, cultural differences, individual differences, social orientation

## 1 | INTRODUCTION

Psychological scientists tend to conceptualize culture from two distinct perspectives. On the one hand, cross-cultural researchers have assumed that culture is personality writ large, and have aimed to identify unitary constructs

to assess individual differences *across* different cultures (Harris, 1979; Skinner, 1938; Smith & Bond, 1998). On the other hand, cultural psychologists have focused on specifics of psychological processes *within* a given culture, opposing the idea that cultural differences are reducible to a handful of individual differences (Malinowski, 1992; Shweder,

1991; Wundt, 1888). Despite fundamental differences between cross-cultural and cultural psychologists, researchers from both traditions have shown an increasing interest in the same two cultural constructs: social orientation, namely independence versus interdependence<sup>1</sup> (e.g., the relative importance of self in relation to others; Markus & Kitayama, 1991; Triandis, 1989) and cognitive style (e.g., the degree to which contexts are considered in reasoning; Nisbett, Peng, Choi, & Norenzayan, 2001; Witkin & Goodenough, 1981).

Recently, the validity of these constructs was called into a question, with a handful of studies demonstrating that measures of social orientation do not correlate among themselves nor do measures of cognitive style correlate among themselves (Dong, Talhelm, & Ren, 2018; Kitayama, Park, Servincer, Karasawa, & Uskul, 2009; Na et al., 2010; San Martin, Schug, & Maddux, 2019). Following on this initial work, we attempted to systematically evaluate the correlations among measures of social orientation and among measures of cognitive style. We also aimed to explore new ways to conceptualize social orientation and cognitive style through the lens of behavioral profiles.

## 1.1 | Social orientation and cognitive style

Ideas concerning social orientation and cognitive style can be traced to the late 19th century. For instance, Tönnies (1887/1988) described human relationship patterns in terms of one's social orientation toward a community versus one's self-interest. Contemporary definitions of social orientation similarly focus on the relative importance of one's group versus the self (Markus & Kitayama, 1991; Triandis, 1989; Varnum, Grossmann, Kitayama, & Nisbett, 2010). This definition has been applied to characterize cultural differences in emotion, motivation, and the self, with some cultures favoring *interdependence*—viewing the self as connected to others and emphasizing harmonious relations with others—and other cultures favoring *independence*—viewing the self as separate from others and emphasizing uniqueness (Markus & Kitayama, 1991).

Another major difference between cultures is holistic versus analytic cognitive style characterized as preference for contextualized versus decontextualized cognition (Nisbett et al., 2001; Varnum et al., 2010; Witkin & Goodenough, 1981). This distinction can be traced back to William James, who distinguished between associative and rule-governed reasoning (1890/1890/1950). The notion of cognitive style has been applied to characterize cultural differences in social cognition, with some cultures preferring a *holistic* cognitive style—focusing on the larger context and attending to similarities and relationships—and other cultures preferring an *analytic* cognitive style—separating a focal object from its context and reasoning about it using categories and rules (Nisbett et al., 2001).

Using these characterizations of social orientation and cognitive style, researchers have documented a wide range

of group-level differences. East Asians are relatively interdependent and holistic as compared to Americans (Markus & Kitayama, 1991; Nisbett et al., 2001). Eastern Europeans are relatively interdependent and holistic as compared to Western Europeans (Kühnen et al., 2001; Varnum, Grossmann, Katunar, Kitayama, & Nisbett, 2008), who are in turn more interdependent and holistic than North Americans (Kitayama et al., 2009). Similar variations occur within countries. Southern Italians are relatively more interdependent and holistic than Northern Italians (Knight & Nisbett, 2007) and Japanese from Hokkaido (a northern island) are relatively more independent and analytic than mainland Japanese (Kitayama, Ishii, Imada, Takemura, & Ramaswamy, 2006). Likewise, people from middle-class backgrounds are more independent and analytic than people from working-class backgrounds (Grossmann & Varnum, 2011; Kraus, Piff, Mendoza-Denton, Rheinschmidt, & Keltner, 2012; Stephens, Fryberg, & Markus, 2011; Varnum, Na, Murata, & Kitayama, 2012).

## 1.2 | Social orientation and cognitive style: Unitary construct versus behavioral profile perspectives

A noteworthy development in cross-cultural research concerns treating both social orientation and cognitive style as unitary constructs that are defined by a mutually correlated network of features (Choi, Koo, & Choi, 2007; Singelis, 1994; Triandis, 1996). That is, some scholars assume that a single task with decent reliability would be sufficient for assessing individual differences in these constructs. For example, an individual whose score was higher on one type of task measuring interdependence would be expected to have a higher score on every other task measuring interdependence. This view is rooted in differential psychology (e.g., theorizing about the *g*-factor in research on cognitive abilities; Allport & Odbert, 1936; Eysenck, 1990; McCrae & Costa, 1999). From this perspective, one's scores on a single task of a construct would predict one's scores in other measures of the same construct.

Unitary construct perspective is not the only way to conceptualize individual differences. An alternative, *behavioral profile* perspective suggests that individual differences in either social orientation or cognitive style might consist of loosely connected, cross-temporally stable subdomains of broader constructs that successfully differentiate cultures. We elaborate on this perspective below.

Several contemporary models of individual differences suggest that personality is best viewed through the lens of situationally contingent profiles (Fleeson, 2007; Furr & Funder, 2004; Mischel & Shoda, 1995). In this view, personality characteristics may be expressed differently from one situation to the next, resulting in low consistency *across* situations but high consistency *within* the same situation across

time. Thus, reliable cross-situational profiles can emerge. In these theoretical models, variability is not regarded as a random error. Instead, these models suggest that the variability can be systematic, reflecting stable profiles of one's behaviors across various situations (Furr, 2009; Shoda, Mischel, & Wright, 1994). For example, Person A may be aggressive at a party and would also be aggressive at another similar party (measured with a "party aggression" instrument) although the person may not be aggressive in a different situation, such as at work (a tendency which might be measured with a "work aggression" instrument). In contrast, Person B may be consistently aggressive at work, but not at all aggressive during social gatherings. As a consequence, distinct and stable behavioral profiles of Person A and Person B would yield negligible correlations between these "aggression" measures when aggregating responses across multiple individuals.

Just as within-person variability across different situations is an integral aspect of one's personality system, so too could within-person variability across measures be an important aspect of one's cultural orientation. Specifically, different situations require different psychological skills or propensities, which allows for within-person variability in the personality system. Likewise, different measures of social orientation or cognitive style recruit different types of psychological skills or propensities, which leads to within-person variability across measures. Notably, measures of social orientation/cognitive style capture a wide range of ways people use to navigate their culture. For social orientation, measures include the representation of emotions, self-views, emotional reactivity, or adherence to social norms. For cognitive style, measures include attention, memory, and higher-order reasoning. Therefore, unique profiles of satisfying the culture-specific ways of being can exist depending on personality traits, different types of skills, exposure to idiosyncratic cultural niches, and preferences for some aspects of a culture rather than others. For one person, this may include emphasizing the self, but ignoring emotional reactivity, whereas for another person, it may be about adhering to social norms, with a weaker focus on one's self. Importantly, such profiles may remain stable over time. As a consequence, performance on measures of social orientation (or cognitive style) may show weak consistency across tasks at a given time point, while simultaneously forming cross-temporally stable behavioral profiles. An empirical test of this proposition requires examining whether one's profiles of responses to various measures of social orientation/cognitive style would be stable *across time points*.

### 1.3 | Past research reveals an isomorphic puzzle of social orientation and cognitive style

A handful of studies have begun to explore the construct-related nature of social orientation and cognitive style. Results

from these studies reveal that measures within each ostensible construct of social orientation or cognitive style are negligibly correlated. Kitayama and colleagues (2009) administered four social orientation and two cognitive-style measures in four different cultures (the United States, the United Kingdom, Germany, and Japan) and found that measures did not correlate among themselves within each culture. Building on this initial demonstration, Na and colleagues (2010) used a wide range of measures of social orientation and cognitive style in the United States and found that correlations among measures of each construct were negligible, even though these measures systematically differentiated working class participants from middle-class participants. The negligible cross-measures correlations suggested that individual differences in social orientation and cognitive style do not represent distinct unitary constructs.

Na et al. (2010) also demonstrated the lack of isomorphism (i.e., the differences between individual level and cultural level): Examination of cognitive style scores on two tasks collected in five countries (Croatia, Germany, Japan, the United Kingdom, and the United States) revealed substantial correlations on the group level ( $r = .82$ ), despite negligible individual-level correlations within each country. This lack of isomorphism across individual and cultural levels is consistent with earlier theories in cross-cultural research (Hofstede, 1980; Schwartz, 1994). Moreover, it suggests that social orientation and cognitive style do not follow the same pattern as cultural values (Fischer & Poortinga, 2012) or Big Five personality (McCrae, Terracciano, & Personality Profiles of Cultures Project, 2005), in that both of them show a convergence between individual and group levels.

### 1.4 | Limitations of prior research

Though the initial evidence appears to suggest that neither social orientation nor cognitive style are unitary constructs, the evidence so far has been limited due to the breadth of the tasks used (Kitayama et al., 2009) or diversity of samples (Na et al., 2010). Kitayama and colleagues employed only a small number of social cognitive tasks, whereas Na and colleagues have only tested subgroups within the United States and looked at correlations between only two measures in a handful of countries. Moreover, little is known about the cross-temporal stability of tasks themselves. It is possible that the measures do not even show *intra*individual stability and therefore violate the ergodicity principle (Molenaar & Campbell, 2009), which states that *intra*individual consistency is a necessary condition for making *inter*individual inferences, including examination of relationships between measures.

### 1.5 | Present research

We address prior limitations by systematically replicating previous observations of negligible correlations among a

broad range of tasks assessing social orientation and cognitive style, respectively, on random stratified samples of Japanese and Americans (Study 1). We selected these target cultures because of the frequency with which these groups have been used in prior research on social orientation as well as cognitive style (e.g., Markus & Kitayama, 1991; Nisbett et al., 2001). Second, we examined whether within-person variability would be stable and predictable (Study 2). Toward this end, we asked a community sample of Americans and Canadians to complete several measures of social orientation and cognitive style at different time points and examined both the stability of individual tasks, as well as the cross-temporal stability of possible behavioral profiles assessed via latent class analyses (LCA).

## 2 | STUDY 1

Study 1 attempted to systematically probe the interindividual associations of a range of widely used measures of social orientation/cognitive style with diverse samples of Japanese and Americans. We expected that the correlations among measures of social orientation/cognitive style would be negligible within each culture and perhaps also when collapsing across both cultural groups.

## 2.1 | Methods

### 2.1.1 | Participants

We recruited a socioeconomically diverse sample of Japanese from the Tokyo Metropolitan area ( $N = 433$ ) and Americans from the Washtenaw County in Michigan ( $N = 233$ )<sup>2</sup> with an approximately equal number of participants of both genders and of each of three age groups (25–40, 41–59, 60–79). Detailed demographic information is summarized in Table 1.

### 2.1.2 | Procedure

Participants in the United States were invited to three different sessions of a 2-hr study and paid \$70 for each session. Participants in Japan first filled out a questionnaire packet and came in for two different laboratory sessions in return for equivalent monetary compensation. In these sessions, participants completed a range of social and cognitive tasks, selected for their success in differentiating cultural groups in prior research (see Varnum et al., 2010, for review). Since the data were collected across three sessions and participants were allowed to skip any question they were uncomfortable with, the number of participants varies across tasks (see Table 2). We report results from six social and eleven cognitive measures

	<i>N</i>	<i>M</i> age ( <i>SD</i> )	% of female	% of college education
Study 1: JPN	433	46.60 (13.84)	49.7	75.8
Study 1: US	233	48.23 (15.34)	51.1	87.6
Study 2: Time 1	485	36.80 (11.43)	58.1	91.7
Study 2: Time 2	235	37.99 (11.45)	60.4	91.9

**TABLE 1** Demographic information

**TABLE 2** The number of participants for each measure in Japan and the United States

	Japan	United States		Japan	United States
IOS	172	187	Inclusion	188	221
Engaged vs. disengaged emotions	429	227	Proverb	188	231
Predictor of happiness	424	227	Change	178	209
Self-inflation	173	185	Triad	172	189
Vocal Stroop	161	153	Attribution	433	188
Self-construal	431	189	Outside in	186	228
<i>All</i>	154	141	FLT	178	210
			Change blindness	155	204
			Narrative	173	199
			Underwater	177	203
			TST	167	222
			<i>All</i>	138	151

previously used as markers of social orientation and cognitive style, respectively. For each measure of the social construct, larger values reflect more interdependent and less independent social orientation. For each of the cognitive construct, larger values reflect more holistic and less analytic cognitive style. For measures consisting of subscores, we calculated a relative score reflecting more interdependence/holistic reasoning and less independence/analytic reasoning based on prior theorizing and empirical findings (e.g., Kitayama, 2002; Na et al., 2010). Although the main analyses were based on the relative indexes, we performed relevant analyses on subscores in the Supporting Information which yield very similar results (see Supporting Tables 1 and 2). The following section describes exactly how we calculated scores for each task. Table 3 summarizes the means, standard deviations, and reliabilities of the measures. Also, we reported reliabilities of subscores in the case of measures with subscores.

### 2.1.3 | Data repository

Supplemental analyses and data for both studies are posted online at <https://osf.io/hb2zg>.

## 2.2 | Measures of independent versus interdependent social orientation

### 2.2.1 | Inclusion of other in the self (IOS) scale

The IOS scale (Aron, Aron, & Smollan, 1992) is a pictorial measure of closeness. In the IOS scale, a series of two circles is provided where the degree of overlap between them progresses linearly, creating a 7-point scale of relational closeness. Participants selected one pair of circles that best represents their relationships with family members.

### 2.2.2 | Intensity of engaged emotion

This measure was computed from the Implicit Social Orientation Questionnaire (Kitayama, Mesquita, & Karasawa, 2006). In this questionnaire, participants were asked to remember 10 social episodes (e.g., “when I had a positive interaction with friends”) and indicate the intensity of experiencing each of 12 emotions. Among those emotions, three different types were embedded: general positive

**TABLE 3** Means, SDs, and reliabilities of measures of social orientation and cognitive style

	Japan			United States			Japan vs. United States		
	<i>M</i> ( <i>SD</i> )	$\alpha$ ( <i>n</i> )		<i>M</i> ( <i>SD</i> )	$\alpha$ ( <i>n</i> )		<i>t</i> ( <i>df</i> )	<i>p</i>	<i>d</i>
		Ind/Ana	Int/Hol		Ind/Ana	Int/Hol			
<b>Social orientation</b>									
IOS	5.65 (1.31)			5.07 (1.52)			3.81 (357)	<.001	0.40
Intensity of engaged emotions	0.32 (0.72)	.78 (10)	.74 (10)	−0.43 (0.62)	.78 (10)	.73 (10)	13.26 (654)	<.001	1.09
Predictor of happiness	0.50 (0.48)			0.23 (0.60)			6.15 (649)	<.001	0.51
Self-inflation	−0.14 (0.30)			−0.25 (0.40)			3.07 (356)	.002	0.33
Vocal Stroop (log)	6.28 (0.23)	.84 (14)		6.04 (0.67)	.94 (14)		4.22 (312)	<.001	0.47
Self-construal	−0.11 (0.54)	.65 (12)	.69 (12)	−0.43 (0.88)	.52 (12)	.62 (12)	5.39 (618)	<.001	0.43
<b>Cognitive style</b>									
Inclusive reasoning	66.52 (18.42)	.96 (97)		47.78 (18.27)	.96 (97)		10.30 (407)	<.001	1.02
Proverb	0.50 (0.70)	.87 (8)	.88 (8)	0.32 (0.80)	.86 (8)	.85 (8)	2.41 (417)	.016	0.24
Change	46.37 (12.39)	.70 (8)		32.1 (10.61)	.73 (8)		12.20 (385)	.001	1.24
Triad (log)	−0.99 (0.80)	.88 (14)		−1.11 (0.72)	.78 (14)		1.58 (359)	.115	0.18
Attribution	0.11 (1.10)	.67 (8)	.65 (8)	−0.17 (1.26)	.58 (8)	.56 (8)	2.78 (619)	.006	0.24
Outside in (log)	1.17 (0.74)	.52 (2)		0.67 (0.73)	.62 (2)		6.91 (412)	<.001	0.70
FLT	6.65 (7.66)	.64 (6)	.48 (4)	6.83 (6.74)	.62 (6)	.52 (6)	−0.24 (386)	.807	−0.02
Change blindness	0.35 (0.84)	.57 (4)	.51 (4)	0.05 (0.72)	.63 (4)	.63 (4)	3.54 (357)	<.001	0.38
Underwater animation (log)	3.92 (0.49)	.93 (8)	.87 (8)	4.3 (0.40)	.88 (8)	.87 (8)	8.30 (378)	<.001	0.86
Narrative	−58.66 (33.83)	.78 (4)	.60 (4)	−68.25 (37.76)	.64 (2)	.24 (2)	2.56 (370)	.011	0.27
TST	0.89 (0.13)	.64 (20)		0.69 (0.31)	.86 (20)		7.78 (387)	<.001	0.79

emotions (e.g., happiness), socially engaged positive emotions (e.g., friendly feeling), and socially disengaged positive emotions (e.g., personal pride). We calculated the relative intensity of experiencing engaged versus disengaged emotions as an index of the relative importance of social relations. The score was the average of engaged minus disengaged emotions across 10 episodes.

### 2.2.3 | Predictors of happiness

This measure was also computed from the Implicit Social Orientation Questionnaire (Kitayama, Mesquita, et al., 2006). In this measure, we examined the relative effects of socially engaged emotions versus socially disengaged emotions on happiness. The score was the regression coefficients predicting general positive emotions as a function of socially engaged versus socially disengaged emotions. To the extent that they view themselves as connected to others, socially engaged emotions would be more associated with happiness more than socially disengaged emotions.

### 2.2.4 | Self-inflation

We calculated this measure following the guidelines of the Sociogram task (Duffy, Uchida, & Kitayama, 2013). In the task, participants were asked to draw their social network by using circles to represent the self and others. We calculated the size (i.e., diameter) of the self-circle relative to the other-circles as an index of self-inflation. The score was calculated by dividing the size of self-circle by the average size of other circles while controlling for the overall area of the drawing (defined by the outer horizontal and vertical margins).

### 2.2.5 | Vocal Stroop task

In the Vocal Stroop task, words that are either positive (e.g., “wedding”) or negative (e.g., “funeral”) are pronounced in either an emotionally positive or negative tone (Kitayama & Ishii, 2002). Participants were asked to judge whether each word is positive or negative and we measured the reaction time for congruent trials (positive words in positive tone or negative words in negative tone) and incongruent trials (positive words in negative tones or negative words in positive tones) as an index of their sensitivity to social cues. The score was the interference effect of vocal tone: reaction times for incongruent trials (e.g., “wedding” in a negative tone) minus the congruent trials (e.g., “wedding” in a positive tone).

### 2.2.6 | Self-construal scale

In the Self-Construal scale (Singelis, 1994), participants indicated how much they agreed with 10 independent (e.g., “I always try to have my own opinions”) and 10 interdependent statements (e.g., “I am concerned about what people think of me”). The score was ratings of interdependent statements minus those of independent statements.

## 2.3 | Measures of analytic versus holistic cognitive style

### 2.3.1 | Inclusion task

The task investigated the amount of information participants considered before making the final attribution (Choi, Dalal, Kim-Prieto, & Park, 2003). In the task, participants imagined that they were a detective investigating a murder case. Participants received 97 clues that may or may not be relevant to the case (e.g., the number of pets the victim owned and the victim's history of sexual abuse by his/her parents) with a task to exclude clues which they thought were causally irrelevant. The score was the number of items that participant thought was causally relevant to the event.

### 2.3.2 | Proverb task

The task measured whether people preferred dialectical (holistic) versus linear (analytic) reasoning (Peng & Nisbett, 1999). Participants read eight dialectical (“Too humble is half proud”) and eight nondialectical (“One against all is certain to fall”) proverbs, reporting their preferences for each proverb on a 7-point scale (1 = *Not at all* to 7 = *Very much*). The score was the relative preference for dialectical proverbs versus the nondialectical proverbs.

### 2.3.3 | Change task

This task measured how much participants thought that contradictory events depicted in a written scenario (e.g., people who fought as children might become lovers as adults or a person who grew up in a low-income family might become rich) was likely to happen in the future (Ji, Nisbett, & Su, 2001). To the extent that participant based their reasoning on focal information (i.e., the current status), they believe that a future event that is contradictory to the current status would be less likely to happen. There were eight scenarios, and participants were asked to estimate a probability for each scenario (0%–100%).

### 2.3.4 | Triad task

The task examined whether participants categorized 14 objects based on a thematic relation versus focal attributes (Chiu, 1972). For each object (e.g., “a cow”), participants chose one of two alternatives (e.g., “chicken” vs. “grass”). One alternative was thematically related to the target (e.g., grass) and the other belonged to the same taxonomic category as the target (e.g., chicken). The final score concerned the number of thematic categorizations.

### 2.3.5 | Causal attribution task

The task examined the extent to which participants attributed the causality to an actor versus the context (Kitayama, Ishii, et al., 2006). Specifically, participants read four vignettes describing either positive or negative behavior of a target (two positive vignettes and two negative vignettes). For each vignette, they indicated their level of agreement with two items reflecting dispositional attribution and two items reflecting situational attribution on a 7-point scale (1: Strongly Disagree–7: Strongly Agree). Following prior research, the final score concerned participants' ratings for situational attributions minus those for dispositional attributions (Kitayama, Ishii, et al., 2006).

### 2.3.6 | Outside-in task

The task measured whether participants took a third person (holistic) or a first person (analytic) perspective when they thought about their past experience (Cohen & Gunz, 2002). First, participants recalled a specific instance of two social situations (when you had a conversation with a friend or when you were embarrassed). Next, they indicated whether the memory was a first-person memory or a third-person memory on an 11-point scale (1 = *Entirely first-person memory*–11 = *Entirely third-person memory*).

### 2.3.7 | Framed line test (FLT)

The FLT measured how easily participants ignored versus took into account contextual information (Kitayama, Duffy, Kawamura, & Larsen, 2003). In this task, participants saw a square with a line drawn inside it and were asked to reproduce the line inside a new square of a different size either by duplicating its absolute length (ignoring the context of the square) or its length relative to the square (by drawing a line with the same proportion as in

the original square). The score was the error in millimeters for the absolute judgments minus the error in millimeters for the relative judgments.

### 2.3.8 | Change blindness task

The task examined how easily participants detected changes in focal versus background objects in order to measure whether they paid attention to focal versus background objects (Masuda & Nisbett, 2006). Specifically, participants watched four pairs of animated scenes, such as a construction site and an airport. Each scene pair consisted of two similar, but slightly different vignettes, and participants were asked to detect the difference between them. The number of changes noticed in focal objects and contexts was counted. Following prior research, the final score was the frequency of contextual changes noticed minus the frequency of focal object changes noticed (Masuda & Nisbett, 2006). Note that both Japanese and American participants detected more changes in the context than in focal objects. One may assume that, if Americans are analytic, then they should always detect more changes in focal objects than in the context. However, if focal objects are not salient enough, even Americans may not be attracted by them. In other words, one's tendency to attend to focal versus background objects is reflected in the relative difference between focal and background changes. A similar logic applies to two other measures described below.

### 2.3.9 | Underwater animations task

Participants watched eight animated vignettes of fish and were asked to recall what they saw after seeing each vignette. As in the narrative task, we counted the number of statements about focal objects (i.e., focal fish) and background objects or the context. The final score concerned the frequency that participants mentioned the context minus the frequency they mentioned focal fish.

### 2.3.10 | Narrative task

The task examined whether participants paid attention to the main character versus other supporting characters (Chua, Leu, & Nisbett, 2005). In this task, participants watched two video clips (events at Swimming Pool and Library) and read two one-page stories (about a working mother, Kathy, and a college graduate, Lea). After watching/reading each episode, participants were asked to

recall what they saw or read and we counted the number of statements about focal characters and other supporting characters. The final score was the frequency that other characters were mentioned minus the frequency that focal characters were mentioned.

### 2.3.11 | Twenty statements task

In the Twenty Statement task (TST) (Kuhn & McPartland, 1954), participants were asked to describe themselves in 20 different ways. The statements were coded as reflecting abstract/dispositional representation versus concrete/contextual representation of self, following the guidelines outlined by Rhee, Uleman, Lee, and Roman (1995). For instance, decontextualized statements like “kind,” “friendly,” as well as universal and existential statements like “human being,” or “myself” were quantified as abstract, whereas statements like “kind to my parents,” “friendly to my neighbors,” as well as statements representing social identity “salesperson,” and preferences “like to help people” were quantified as contextualized. The score was the proportion of concrete/contextual statements.

## 2.4 | Results

We replicated previously reported cultural differences on measures of social orientation and cognitive style. As Table 3 indicates, Japanese showed more interdependent (vs. independent) social orientation on most measures, with the cultural differences being of moderate/high magnitude ( $d > 0.4$ ; except for self-inflation). Similarly, Japanese showed more holistic (vs. analytic) cognitive style than Americans on most measures (except for FLT), with the cultural differences being of low to moderate magnitude.<sup>3</sup>

If coherent group differences are due to different cultural distributions of unitary constructs of social orientation and cognitive style, respectively, correlations among measures should be positive and significant. However, we observed negligible correlations for social orientation not only in the United States (mean  $r = .05$  & median  $r = .02$ ) but also in Japan (mean  $r = .04$  & median  $r = .05$ , see Table 4). These correlations did not increase when collapsing across cultural groups, mean  $r = .10$  & median  $r = .07$  (Supporting Table 3). Similarly, cognitive style measures did not correlate among themselves either in Japan (mean  $r = .03$  & median  $r = -.004$ ) or the United States (mean  $r = .02$  & median  $r = -.01$ , see Table 5). Correlations were

	1	2	3	4	5	6
1. IOS	–	0.070	–0.015	0.027	0.335**	–0.022
2. Engaged vs. disengaged emotions	0.055	–	0.110	–0.108	–0.016	0.169*
3. Predictor of happiness	0.150	0.233**	–	0.137	–0.094	–0.023
4. Self-inflation	–0.122	–0.062	–0.141	–	–0.029	0.022
5. Vocal Stroop	0.119	–0.001	0.131	–0.065	–	0.180*
6. Self-construal	0.148	0.067	0.045	0.015	0.048	–

\* $p < .05$ ; \*\* $p < .001$ .

**TABLE 4** Pearson's correlations among measures of social orientation for Japanese (below the diagonal) and Americans (above the diagonal)

**TABLE 5** Pearson's correlations among measures of cognitive style for Japanese (below the diagonal) and Americans (above the diagonal)

	1	2	3	4	5	6	7	8	9	10	11
1. Inclusion	–	–0.022	–0.019	0.073	–0.049	0.106	–0.054	0.114	0.082	–0.052	–0.002
2. Proverb	0.053	–	0.091	0.094	0.017	0.073	–0.035	–0.004	–0.076	–0.068	–0.035
3. Change	0.151*	–0.034	–	0.142	0.056	0.023	0.089	–0.090	0.193**	0.122	–0.084
4. Triad	–0.135	–0.030	0.041	–	0.090	–0.028	0.095	–0.017	0.065	0.209**	–0.111
5. Attribution	–0.049	–0.051	0.190*	–0.045	–	–0.038	0.216**	–0.115	0.129	–0.040	–0.008
6. Outside in	–0.003	–0.086	0.060	–0.127	0.037	–	–0.017	–0.027	0.114	–0.116	–0.023
7. FLT	0.012	–0.016	0.193*	–0.015	0.116	–0.006	–	0.001	0.133	0.212**	–0.076
8. Change blindness	–0.040	–0.014	–0.021	–0.052	0.117	0.064	0.115	–	–0.021	–0.108	–0.074
9. Narrative	–0.063	–0.065	–0.004	–0.030	0.004	–0.020	–0.029	0.091	–	0.139	–0.058
10. Underwater	–0.067	–0.065	0.185*	0.011	0.164*	0.095	0.158*	0.042	0.325**	–	0.032
11. TST	–0.044	–0.030	–0.055	0.046	0.124	–0.049	–0.015	0.166*	0.109	0.141	–

\* $p < .05$ ; \*\* $p < .001$ .

weak even when collapsed across cultures, mean  $r = .08$  and mean  $r = .06$  (Supporting Table 4).

Next, we conducted exploratory factor analyses (extraction: maximum likelihood) within each culture and when collapsed across cultures to further examine the coherence at the individual level. For social orientation, the first factor did not explain more variance (Japan: 17.44%, US: 17.85%; All: 19.01%) than each measure would on its own (i.e., when assuming measures are orthogonal; 17%). Results were similar for cognitive style: The variance explained by the first factor (Japan: 14.11%, US: 12.14%, All: 11.87%) was only trivially different from the standard criterion of variance explained for 1 measure out of 11 (9%). The first factor was driven by a single measure for both social orientation and cognitive style (see Table 6).

In sum, measures of social orientation or cognitive style showed little coherence at the individual level. The findings replicated previously reported patterns of negligible correlations for such measures among random stratified samples of Japanese and Americans, despite significant and frequently sizable cultural differences on most of the same measures. Zero-order correlations remain negligible when measures of social orientation and cognitive style are combined (see Supporting Information). However, the evidence so far concerns single-shot observation of interindividual variability across measures of ostensible constructs of social orientation and cognitive style. Thus, it is possible that lack of coherence between tasks is due to low stability of tasks—stability being a prerequisite for coherence between tasks (Molenaar & Campbell, 2009). We addressed the question of intraindividual stability in key measures of social orientation/cognitive style in Study 2.

### 3 | STUDY 2

To investigate whether within-person variability would be predictable, Study 2 examined whether individual measures of social orientation/cognitive style are cross-temporally stable. Further, we examined the stability of the relationships between individual tasks of social orientation and cognitive style over time by probing existence and stability of behavioral profiles. Such cross-temporally stable profiles can emerge despite trivial correlations among tasks measured at a single sampling point.

#### 3.1 | Methods

##### 3.1.1 | Participants and procedures

We recruited 485 adults (201 males, 281 females, 1 other, and 1 no response) from the Amazon Mechanical Turk at Time 1. Any worker on the MTurk could participate in Study 2 as long as they lived in the United States or Canada. They completed eight tasks (four social orientation and four cognitive style tasks). All these tasks were selected based on the frequency of use in prior research as well as high internal reliability in Study 1. About one month after the initial data collection, we contacted participants and asked them to complete the same eight tasks again. Two hundred and thirty-five participants out of 485 (retention rate: 48%) participated in the second portion of Study 2 at Time 2. Both samples consisted predominantly of people of European descent (Time 1:380 European

**TABLE 6** Factor loadings and the percent of variance explained by the first factor

Social orientation				Cognitive style			
Measures	Japan	United States	ALL	Measures	Japan	United States	ALL
IOS	0.150	0.030	0.308	Inclusion	-0.035	0.085	0.148
Intensity of engaged emotions	0.124	0.648	0.088	Proverb	-0.004	-0.082	0.053
Predictor of happiness	0.089	0.053	0.025	Change	0.483	0.229	0.341
Self-inflation	0.013	-0.767	0.000	Triad	-0.042	0.196	0.116
Vocal Stroop	0.040	0.222	0.999	Attribution	0.210	0.073	0.116
Self-construal	0.999	0.092	0.195	Outside in	0.016	0.261	0.139
				FLT	0.373	0.224	0.128
				Change Blindness	0.040	-0.113	0.010
				Underwater	0.666	0.799	260
				Narrative	0.829	0.672	0.999
				TST	0.002	-0.067	0.189
% of Variance	17.44	17.85	19.01	% of Variance	14.11	12.14	11.87

Americans/European Canadians, 37 African Americans/Canadians, 26 Hispanic American/Canadians, 36 Asian Americans/Canadians, 5 Others, and 1 no response and Time 2:191 European Americans/Canadians, 15 African Americans/Canadians, 12 Hispanic American/Canadians, and 17 Asians Americans/Canadians). The demographic composition of the sample did not differ significantly at Time 1 versus Time 2 (see Table 1).

### 3.1.2 | Measures of social orientation and cognitive style

We included four measures of social orientation and cognitive style, respectively. We selected these measures based on their high degree of internal stability in Study 1: Inclusion of Other in the Self scale (IOSS), Intensity of engaged versus disengaged emotion, Predictor of happiness, the Self-construal scale for social orientation and Outside-in task, Inclusion task, Change task, and the modified TST. These measures were administered in the same way as Study 1 except that participants were asked to describe themselves in 10 different ways as opposed to 20 different ways in the modified TST. We calculated the scores for these tasks in the same way as Study 1. Table 7 includes inter-item reliability for each multi-item task. Note that reliability was calculated for subscale if applicable.

## 3.2 | Results

### 3.2.1 | Internal consistency across measures

First, we examined the inter-task consistency among the distinct tasks measuring social orientation and cognitive style. As shown in Table 8, correlations among the measures of social orientation were negligible at Time 1, with the exception of a negative correlation between Engaged versus Disengaged Emotions and Self-Construal,  $r = -.182$ ,  $p < .001$ . Both mean and median correlations were close to zero, mean  $r = -.036$  and median  $r = -.036$ . The same pattern was observed at Time 2. Specifically, most correlations were negligible, with an exception of a negative correlation between the task assessing the intensity of engaged versus disengaged emotions and the self-construal task,  $r = -.233$ ,  $p < .001$ , mean and median  $r$ s =  $-.024$  and  $-.013$  (Table 8).

Turning to the cognitive style tasks (Table 9), we observed a single positive correlation between the tasks measuring prediction of change and a tendency for third-person memory,  $r = .127$ ,  $p = .006$ . Overall, there was a trivial degree of inter-task convergence, mean  $r = .040$  and median  $r = .021$ . Similarly, correlations were negligible at Time 2,  $-.113 < r$ s.  $< .019$ , mean  $r = -.037$  and median  $r = -.010$ . To sum up, Study 2 replicated low degree of interindividual stability among measures of social orientation and cognitive

**TABLE 7** Task-specific internal consistency ( $\alpha$ s) at Time 1 and Time 2

	IOSS	Self-construal scale	Engaged vs. disengaged emotions	Outside in	Change	Inclusion	TST
Time 1	0.75 (3)	0.83 (12) <sub>Ind</sub> 0.83 (12) <sub>Inter</sub>	0.82 (10) <sub>Ind</sub> 0.69 (10) <sub>Inter</sub>	0.80 (4)	0.78 (8)	0.92 (6)	0.66 (10)
Time 2	0.72 (3)	0.84 (12) <sub>Ind</sub> 0.86 (12) <sub>Inter</sub>	0.85 (10) <sub>Ind</sub> 0.81 (10) <sub>Inter</sub>	0.71 (4)	0.67 (8)	0.90 (6)	0.72 (10)

Note: Number of item per task is in parentheses. Predictor of Happiness task is not included, because the calculation provides one estimate per time point.

**TABLE 8** Pearson's correlation of measures of social orientation at Time 1 (below diagonal) and Time 2 (above diagonal)

	IOSS	Self-construal	Engaged vs. disengaged emotions	Predictor of happiness	Time 2 $M$ ( $SD$ )
IOSS	<b>0.697**</b>	-0.084	0.076	0.046	4.61 (1.61)
Self-construal	-0.026	<b>0.913**</b>	-0.233**	-0.071	0.54 (1.50)
Engaged versus disengaged emotions	0.048	-0.182**	<b>0.486**</b>	0.112	-0.18 (0.91)
Predictor of happiness	-0.095*	-0.046	0.087	<b>0.161*</b>	0.38 (1.01)
Time 1 $M$ ( $SD$ )	4.55 (1.70)	0.55 (1.38)	-0.19 (0.90)	0.43 (0.91)	

Note: Cross-temporal correlations of each task (highlighted in bold) are presented on the diagonal. At both time points, a few participants reported not experiencing events necessary for calculation of the emotion-related measures or reported no variability in reports of happiness, leading to smaller samples for these tasks (Time 1  $n = 462$ /Time 2  $n = 229$ ).

\* $p < .05$ ; \*\* $p < .001$ .

**TABLE 9** Pearson's correlations among measures of cognitive style at Time 1 (below diagonal) and Time 2 (above diagonal)

	Outside in	Change	Inclusion	TST	Time 2 <i>M</i> ( <i>SD</i> )
Outside in	<b>0.704**</b>	0.018	−0.112	−0.107	2.88 (2.02)
Change	0.127**	<b>0.526**</b>	−0.009	−0.010	28.25 (10.06)
Inclusion	0.019	0.023	<b>0.619**</b>	−0.001	47.32 (17.91)
TST	0.003	−0.024	0.092*	<b>0.471**</b>	0.20 (0.21)
Time 1 <i>M</i> ( <i>SD</i> )	3.16 (2.35)	28.16 (12.08)	45.83 (17.77)	0.22 (0.21)	

Note: Cross-temporal correlations of each task (highlighted in bold) are presented on the diagonal. At both time points, a few participants reported not experiencing events necessary for calculation of the Outside-in measure, leading to smaller samples for this task (Time 1  $n = 465$ /Time 2  $n = 231$ ).

\* $p < .05$ ; \*\* $p < .001$ .

style, even among the tasks showing a conventionally moderate-high level of internal reliability.

### 3.2.2 | Cross-temporal consistency

Next, we examined whether stability might be observed within each person over time despite the negligible correlations among measures representing social orientation and cognitive style. As shown on the diagonal in Table 8, for social orientation each measure was significantly correlated with itself across time points. Moreover, except for one task, the size of test–retest correlations was moderate-high, mean  $r = .564$  and median  $r = .592$ . The task that showed a low test–retest correlation concerned a single-item prediction of happiness task,  $r = .161$ ,  $p = .015$ . The single-item nature of this estimate may have resulted in the small-moderate cross-temporal consistency of this measure.

Similarly, for cognitive style each measure showed a significant degree of consistency over time, with moderate-high degree of test–retest stability,  $.47 < rs < .70$  (see the diagonal in Table 9). Overall, it is clear that the lack of inter-task correlations for measures of social orientation and measures of cognitive style is not due to low inter-temporal stability of the measures themselves.

### 3.2.3 | Behavioral profiles

Lack of inter-task consistency in social orientation and cognitive style raises questions about the operationalization of these concepts as unitary constructs. However, research on individual differences suggests that such a unitary construct approach is just one of many ways to conceptualize individual differences. In particular, constructs could also be represented through a network of situationally contingent relationships (Epskamp, Borsboom, & Fried, 2018; Fleeson & Furr, 2016; Mischel & Shoda, 1995), in turn forming latent profiles for individuals (Gabriel, Daniels, Diefendorff, & Greguras, 2015; Van den Akker, Deković, Asscher, Shiner, & Prinzie, 2013). In a similar vein, social orientation and

cognitive style could be represented through a network of task–contingent relationships. Person A may score higher on the first task, but low on the second task, and moderate on the third task, whereas person B may score low on the first task, but moderate on the second task and high on the third task. Moreover, these relations might be stable across time.

To address this possibility, we estimated and tested the stability of latent profiles with help of LCA on the Time 1 and Time 2 data, separately. For the LCA, we standardized scores of each measure within each time point and selected participants who completed all the measures at both time points. Also, following the suggestion from Stevens (2012), five participants were excluded because their scores were extreme (more than three *SDs* above/below the mean) at one or more measures. Including these participants resulted in several classes with only one extreme participant in it. As a result, 230 participants were analyzed in the LCA.

Individual profiles would be considered as stable if the number and shape of classes identified at Time 1 and Time 2 were similar to each other and if individuals were categorized into the same class across two time points. We performed all latent profile analyses in Mplus 7.1 (Muthén & Muthén, 2012) using robust maximum likelihood estimator. To determine the adequate number of classes, models with increasing number of classes were compared using the following indexes: (a) the Akaike information criterion (AIC), (b) the Bayesian information criterion (BIC), (c) the sample size-adjusted Bayesian information criterion (SSA-BIC), (d) entropy, (e) the Lo–Mendell–Rubin adjusted likelihood ratio test (LMRT), and (f) the bootstrapped likelihood ratio test (BLRT). The lower values in AIC, BIC, and SSA-BIC indicate a better fit of the model to the data (Nylund, Asparouhov, & Muthén, 2007). Entropy is a measure of classification quality, reflecting better quality as values approach 1 (Celeux & Soromenho, 1996). Finally, LMRT and BLRT indicated whether the model provided a significantly better model fit than a model with  $k$  classes (Nylund et al., 2007).

First, results from four measures of social orientation generally pointed to a two-class model over the other models at both Time 1 and Time 2 (see Table 10). LMRT and

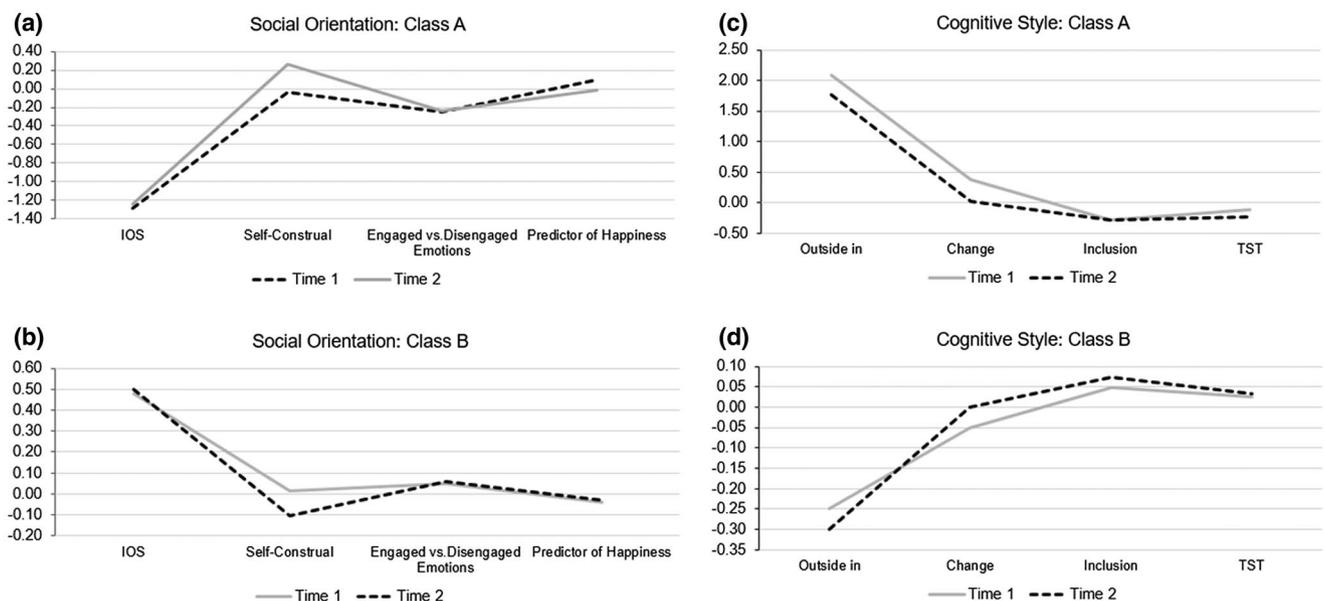
BLRT indicates that the two-class model was better than the one class model, whereas the three-class model was not significantly better than the two-class model. Also, given that entropy values of .60 indicate around 80% correct classification, and entropy values of above .80 indicate 90% correct classification (Lubke & Muthén, 2007), the classification in the two-class model is considered as reasonably good. As shown in Figure 1a,b, classes identified at Time 1 and Time 2 were minimally different from each other. Moreover, 85% of participants (196 out of 230; 40 in Class A and 156 in Class B) were classified into the same class across two time points.

That is, not only were classes identified at Time 1 and Time 2 were similar to each other; participants belonged to the same class at both time points.

We found similar results for four measures of cognitive style. Indicators in Table 10 suggest that a two-class model showed the best fit. Both LMRT and BLRT shows that the two-class model was significantly better than the one-class model. Although BLRT indicates that the three-class model was significantly better than the two-class model, we selected the two-class model over the three-class model because entropy was larger in the two-class model than the three-class

**TABLE 10** Latent class analyses at time 1 and time 2

Number of Classes	Social orientation			Cognitive style		
	2	3	4	2	3	4
Time 1						
AIC	2,562.46	2,558.16	2,548.34	2,570.95	2,552.19	2,541.16
BIC	2,607.16	2,620.05	2,627.42	2,615.64	2,614.08	2,620.24
SSA-BIC	2,565.96	2,563	2,554.52	2,574.44	2,557.03	2,547.34
Entropy	0.76	0.83	0.83	0.91	0.81	0.85
LMRT (p)	0.001	0.34	0.14	0.004	0.11	0.44
BLRT (p)	0.000	0.09	0.000	0.000	0.000	0.000
Time 2						
AIC	2,395.94	2,381.62	2,367.72	2,572.73	2,541.62	2,536.817
BIC	2,440.64	2,443.51	2,446.80	2,617.42	2,603.50	2,615.893
SSA-BIC	2,399.43	2,386.46	2,373.90	2,576.22	2,546.45	2,542.997
Entropy	0.76	0.83	0.85	0.85	0.84	0.87
LMRT (p)	0.002	0.23	0.25	0.04	0.003	0.51
BLRT (p)	0.000	0.000	0.000	0.000	0.000	0.15



**FIGURE 1** Estimated mean levels for measures of social orientation and cognitive style for two classes at Time 1 and Time 2. The Y axis reflects standardized scores

model. As shown in Figure 1c,d, classes identified at Time 1 and Time 2 are virtually the same. Also, 88% of participants (203 out of 230; 15 in Class A & 188 in Class B) belonged to the same class across two time points. Thus, we can conclude that one's behavior profile across four measure of cognitive style remained stable. We also note that a similar conclusion can be drawn from the three-class model.

To sum up, the results of Study 2 suggest that even internally reliable tasks assessing social orientation and cognitive style cannot be reduced to unitary constructs at the individual level: the interindividual associations between the tasks were negligible. At the same time, most tasks showed at least a moderate level of intraindividual, cross-temporal stability. Moreover, both social orientation and cognitive style tasks have stable behavioral profiles: Latent class analysis indicated that profiles of performance across four social orientation tasks and four cognitive style tasks, respectively, was quite stable from Time 1 to Time 2.

## 4 | DISCUSSION

In the present research, two of the most widely studied concepts in cultural psychology, namely social orientation and cognitive style, show substantial interindividual variability across tasks ostensibly measuring the same constructs. Notably, this variability is not due to intraindividual noise. Instead, the relations between measures presented in behavioral profiles of these measures are stable over time. These insights call for a fundamental reevaluation of assumptions among researchers interested in cultural and individual differences in these constructs in terms of both their operationalization and measurement. Below we summarize and discuss some of the implications of the present work.

First, we demonstrated that the dissociation between group- and individual-level processes holds when examining the most comprehensive set of measures of social orientation and cognitive style available to date. Specifically, Study 1 extends the observation of negligible interindividual correlations between social orientation measures as well as between cognitive style measures (Dong et al., 2018; Kitayama et al., 2009; Marquez & Ellwanger, 2014; Na et al., 2010; San Martin et al., 2019) to more representative samples of Japanese and Americans. And yet, on most measures we replicated prior research concerning cultural differences in social orientation and cognitive style (Markus & Kitayama, 1991; Nisbett et al., 2001), observing medium-size effects with our age- and social class-diverse samples (Henrich, Heine, & Norenzayan, 2010). Thus, despite significant group-level differences on social orientation and on cognitive style measures, there is no reason to expect interindividual convergence between tasks for either construct. Indeed, making inferences about cross-task associations just because groups systematically vary on

these tasks is a bona fide example of the ecological fallacy (the fallacy that occurs when inferences about individuals are deduced from inferences about groups to which those individuals belong; Robinson, 1950).

The second insight from the present research is that some of the key tasks claiming to measure either social orientation or cognitive style are *intraindividually* stable, and yet do not correlate with each other. This observation suggests that the lack of convergence of social orientation and cognitive style tasks into unitary constructs is not due to lack of test-retest reliability of the tasks. Rather, neither social orientation nor cognitive style appear to be unitary constructs (e.g., Campbell & Fiske, 1959), raising questions about the concepts' operationalization and measurement. Study 2 starts to shed light on one possible way to re-think these concepts. Latent profile analyses in Study 2 suggest that both social orientation and cognitive style could be described using a set of loosely interrelated behavioral profiles. A profile of loosely connected subcomponents allows for substantial interindividual variability, simultaneously remaining intraindividually stable over time.

When examining the pattern of profiles identified in Study 2, differences in two classes for social orientation appear to be largely driven by the *Inclusion-of-Others-in-the-Self* task (IOS; see Figure 1a,b), whereas differences in two classes for cognitive style are mostly driven by the *Outside-in* and *Change* tasks (see Figure 1c,d). To test whether these patterns would be applicable to other samples, we sought to cross-validate the results from a set of Latent Class Analyses on Japanese and American data in Study 1, including only measures equivalent to those used in Study 2. Supplementary results reported online revealed that profiles identified from Studies 1 and 2 were similar to each other in terms of overall shape and yet, there were also variations across them (see Figure S1). Though observed similarities suggest that the identified profiles in the present research may be generalized to other samples, observed differences between studies indicate that more work is necessary to systematically unpack and evaluate the stability of profiles across diverse samples.

A practical implication of this perspective for culture-relevant concepts is that a single measurement is not sufficient to characterize either cultural or individual differences in social orientation or cognitive style, as it cannot capture such latent profiles. Rather, measuring people across multiple situations appears necessary to fully capture how different people embody or do not embody broad cultural constraints and affordances (Fleeson, 2007; Furr & Funder, 2004; Mischel & Shoda, 1995).

The present work dovetails with emerging literature in social and personality psychology. In particular, research on emotion suggests that cultural differences are best understood from a perspective allowing for interindividual variability in the ways emotions may manifest themselves (Boiger et al.,

2018). For instance, there can be various types of anger, and thus, the vital question is what types of anger one experiences, not whether one experiences anger or not. Accordingly, the central question for research on culture and emotion shifts from mere presence of broad emotional categories such as anger across cultures, to the question of how different aspects of anger may be distributed across cultures (Boiger et al., 2018). Similar to this proposition, it may be more informative to investigate how different profiles of social orientation or cognitive style are distributed across cultures than to focus solely on cultural differences in any given aspect of social orientation and cognitive style.

Before closing, we wish to highlight some important limitations in the present research. Though most measures in the present research showed acceptable degree of inter-item reliability, further measurement work is needed to further improve the reliability of the tasks, and to subsequently test the interindividual correlations between conceptually related tasks of social orientation or cognitive style. Also, previously developed tasks of social orientation and cognitive style vary in the measurement format: Some measures consisted of Likert-type response scales to vignettes (the *attribution task*), whereas others involved open-ended recall of visual scenes (the *change blindness task*) or measured physical features of participant-generated drawings (the *FLT*). Future work may control for the response format of tasks to test whether interindividual correlations among measures would improve. More relevant to the present work, it appears prudent to consider emerging techniques enabling cultural psychologists to analyze one's behavior profile across different measures (e.g., Ram et al., 2013). Addressing this possibility would require the generation of new instruments designed to assess various components of social orientation or cognitive style. Finally, Study 2 focused on North American participants, opening the door for exploring intraindividual stability in social orientation and cognitive style in other cultures.

#### 4.1 | Concluding remarks

For decades, social orientation and cognitive style have been at the center of the demonstration about the role of culture in thought and behavior (Grossmann & Na, 2014; Hamamura, 2012; Heine, 2010; Kitayama et al., 2007; Markus & Kitayama, 2010; Nisbett, 2007; Norenzayan, Choi, & Peng, 2007; Tsai, 2007). The breadth of social orientation and cognitive style has allowed for detecting differences between many different groups such as gender (Kashima et al., 1995), social class (Kraus et al., 2012; Stephens, Markus, & Phillips, 2014), and ethnicity (Markus & Conner, 2013). Possibly because of such breadth, many aspects of social orientation and cognitive

style appear to be only loosely related to each other. We argue that a behavioral profile approach proposed in the present research is one way to conceptualize these loosely related attributes. Moreover, we believe that such a new look at the cultural constructs could motivate a novel program of research situating intraindividual variability in one's various psychological tendencies such as emotions, motivations, and behaviors.

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#### CONFLICTS OF INTEREST

The authors declared no potential conflicts of interest concerning the research, authorship, and publication of this article.

#### ORCID

Jinkyung Na  <https://orcid.org/0000-0002-7100-9606>

#### ENDNOTES

- <sup>1</sup> Also referred to as individualism–collectivism (Hofstede, 1980; Triandis, 1989) or *Gesellschaft* versus *Gemeinschaft* (Greenfield, 2009). We use social orientation as a broad term that encompasses values, motivations, emotions, and behavioral tendencies.
- <sup>2</sup> Originally, we recruited participants over 79 years of age in the United States ( $n = 12$ ). For the sake of comparability with the Japanese sample, we excluded them from the analyses. Results remain virtually identical if including this subsample). Analyses on the American samples were previously reported in Na et al. (2010).
- <sup>3</sup> Additional information regarding cultural differences in these samples is available in Kitayama, Karasawa, Grossmann, Na, Varnum, & Nisbett (2019).

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## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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