

RESEARCH ARTICLE

Self-Construal Priming Reconsidered: Comparing Effects of Two Commonly Used Primes in the UK and China

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Abstract:

Self-construal priming was devised to mimic the effects of chronic cross-cultural differences. Primes designed to activate independent/interdependent self-construals have been found to affect numerous culturally relevant outcomes. However, researchers have rarely checked precisely what these primes activated, nor tested their cross-cultural equivalence. We compared two common priming tasks, Similarities vs. Differences with Family and Friends (SDFF) and Sumerian Warrior Story (SWS), across seven dimensions of independence/interdependence among 118 British and 178 Chinese participants. The two tasks activated different combinations of self-construal dimensions. SWS showed a similar pattern of effects across cultures, whereas SDFF more strongly affected Chinese participants. Neither manipulation closely mimicked the pattern of pre-existing cross-cultural differences between samples. We propose researchers should develop more precisely targeted self-construal primes.

Keywords: Culture as situated cognition, Independence and interdependence, Individualism and collectivism, Multidimensional self-construals, Priming.

Introduction

In cultural psychology, an important issue is to understand the mechanisms underlying observed differences across cultures. Among the potential factors that may matter, many researchers have emphasized the importance of cultural variation in individualism and collectivism (Triandis, 1993) and the related individual-level constructs of independent and interdependent self-construals (Markus & Kitayama, 1991). Some have used measures of these constructs as potential mediators of cross-cultural differences in cognitive, affective, motivational outcomes (e.g., Lam & Zane, 2004; Lewis, Goto, & Kong, 2008; Na & Kitayama, 2011; Singelis & Sharkey, 1995; Zhang & Mittal, 2007). Others have used manipulations to prime individualistic and collectivistic ‘mindsets’, or independent and interdependent self-construals, and thus test directly the effects of these cultural emphases on psychological outcomes (e.g., Gardner, Gabriel, & Lee, 1999; Suh, Diener, & Updegraff, 2008; Trafimow, Triandis, & Goto, 1991; reviewed by Oyserman & Lee, 2008).

However, such priming studies have often omitted to include a manipulation check, and the results of doing so have been equivocal (e.g., Levine et al., 2003). Very different primes have been assumed to activate the same constructs, but they have rarely been compared directly; effects of these primes have been assumed to have cross-cultural meaning, but they have been tested mostly among Western research participants (Oyserman & Lee, 2008). Since independent and interdependent self-construals are now thought to be multidimensional rather than monolithic constructs (Vignoles et al., 2016), it is rather urgent to establish more precisely what is activated by commonly used self-construal primes, and to examine to what extent the effects are consistent across different priming techniques and across cultures.

Priming self-construals

Self-construal refers to how people define and make meaning of the self in relation to others, and the term is commonly associated with a distinction between independent and interdependent self-construals—thought to be respectively prevalent in Western and Eastern cultures (Cross, Hardin, & Gercek-Swing, 2011; Markus & Kitayama, 1991; Smith, Fischer, Vignoles, & Bond, 2013). Self-construal priming tasks usually focus on cueing aspects of an independent self-construal (or “private self”: Trafimow et al., 1991) versus an interdependent self-construal (or “collective self”: Trafimow et al., 1991). Researchers have devised various manipulations aiming to shift the accessibility and salience of these constructs, such as *the similarities vs. differences with family and friends task* (SDFF; Trafimow et al., 1991); *Sumerian warrior story* (SWS; Gardner et al., 1999; Trafimow et al., 1991); and *pronoun-circling task* (Brewer & Gardner, 1996; Gardner et al., 1999).¹

The earliest studies of self-construal priming were reported by Trafimow et al. (1991). They devised and tested the SDFF and SWS manipulations, finding that participants primed with interdependence subsequently generated a higher proportion of “group” (vs. “idiocentric”) free self-descriptions on the Twenty Statements Test (TST, Kuhn & McPartland, 1954), compared to those who had been primed with independence. Trafimow and colleagues’ first study included both North American and Chinese participants. Similar to the effects of priming,

their Chinese participants tended to report a higher proportion of “group” (vs. “idiocentric”) responses on the TST, compared to North Americans. Moreover, the absence of a significant culture x priming interaction suggested that self-construal priming affected both cultural groups in a similar way. These initial findings suggested the exciting possibility that researchers could use self-construal priming to mimic cross-cultural differences in psychological functioning under experimental conditions.

However, this early evidence for the effectiveness of self-construal priming had some limitations. First, use of the TST to measure independent and interdependent self-construals has subsequently been criticized: The TST wording arguably primes independence (Smith, 2011); criteria for coding free self-descriptions as “independent” or “interdependent” are ambiguous and inconsistent across studies (Kanagawa, Cross, & Markus, 2001; Margola, Molgora, Vignoles, Costa, & Travagin, 2011); and further inconsistencies may arise when attempting to compare responses in multiple languages (Smith et al., 2013). Second, the evidence that culture and priming had comparable effects on TST responses was based on the inclusion of just 18 Chinese participants, divided between two priming conditions, in Trafimow and colleagues’ first study. With an average of 9 participants per cell in the Chinese half of their design, there would have been very little statistical power to find possible evidence against cross-cultural equivalence of the SDF manipulation (i.e., a culture x priming interaction). Moreover, the 18 Chinese participants were students at a North American university, thus confounding culture with ethnic minority/migrant status. Study 2 included one cultural group only, and so the SWS manipulation was not tested for cross-cultural equivalence. Thus, more research was needed to confirm initial conclusions about the effectiveness of self-construal priming.

In subsequent studies, self-construal priming manipulations were shown to affect numerous psychological outcomes that also differ across cultures (Cross et al., 2011; Oyserman & Lee, 2008). Studies usually involved applying a single priming task, followed by another task that might measure values (Bovasso, 1997; Briley & Wyer, 2001), social judgments (Gardner et al., 1999), life satisfaction (Suh et al., 2008), or other outcomes of interest. For example, Gardner et al. (1999) found that European-American participants primed with independent or interdependent self-construal showed significant differences in values and social judgements, and Suh et al. (2008) found that independent and interdependent priming activated different cognitive approaches to judging life satisfaction. Hence, researchers argued that many cross-cultural differences in psychological functioning can be explained in terms of ‘situated cognition’ (e.g., Oyserman, 2015), with the relative salience of independent and interdependent self-construals as a key explanatory mechanism.

Surprisingly, however, many of these studies did not include manipulation checks to confirm what was activated by the primes that were used.² This is potentially problematic given the limitations of Trafimow and colleagues’ (1991) initial evidence. Some subsequent studies have tested the effects of self-construal priming on self-construal measures, but these have shown mixed results (cf. Levine et al., 2003; Vohs & Heatherton, 2001; Zhang & Mittal, 2007). Notably, for example, across three studies among North American students, Levine et al. (2003) found no significant effects of self-construal primes on Likert-type measures of independence or interdependence. In their meta-analysis of the culture-priming literature, Oyserman and Lee (2008) concluded that the effects of priming on self-construal measures were mostly “small and heterogeneous across studies” except for one narrowly defined subgroup of TST studies (p. 323). This

mixed pattern of findings suggests a pressing need to reexamine in greater depth and detail what forms of self-construal are activated by commonly used self-construal primes.

Measuring the effects of self-construal primes

One potential explanation for the inconsistent findings of previous studies is that there may be problems not with the priming tasks but with the self-concept measures used to evaluate them. We mentioned above some known limitations of the TST as a measure of independent and interdependent self-construal. Criticisms have also been raised against commonly used Likert-type measures of self-construal, which treat independence and interdependence as separate and unitary dimensions (e.g., Gudykunst et al., 1996; Singelis, 1994; for critiques, see Levine et al., 2003; Smith et al., 2013). Contrary to this two-dimensional model, self-construals are now increasingly thought to be multidimensional, with researchers either distinguishing construals of the self in relation to different kinds of “others” (e.g., Gabriel & Gardner, 1999; Harb & Smith, 2008; Kashima & Hardie, 2000) or focusing on different ways of being independent or interdependent in relation to the same others (e.g., Hardin, Leong, & Bhagwat, 2004; Kağıtçıbaşı, 2005; Vignoles et al., 2016).

Based on two large multinational studies, Vignoles and colleagues (2016) distinguished seven dimensions that were previously confounded within commonly used measures of independence and interdependence: *self-reliance versus dependence on others*, *self-containment versus connectedness to others*, *difference versus similarity to others*, *self-interest versus commitment to others*, *consistency versus variability*, *self-direction versus reception to influence*, and *self-expression versus harmony*. Furthermore, they found that different ways of being independent or interdependent were emphasized in different geo-cultural regions.

Adopting such a multi-dimensional view of self-construal could help to clarify precisely which dimensions are activated by commonly used self-construal primes. Our first research question was therefore to identify which dimensions of self-construal show significant differences in response to self-construal priming, using Vignoles and colleagues’ (2016) seven-dimensional model. We tested a null hypothesis that self-construal priming ought to cue all seven factors to a similar extent (H_{10}) against an alternative hypothesis that the primes would affect some self-construal dimensions significantly more than others (H_{11}).

Comparing the effects of different primes

If self-construal primes do not activate all self-construal dimensions equally, then a logical next question is whether different primes would lead to similar or different profiles of activation. Introducing this possibility, Gardner, Gabriel, and Hochschild (2002, Study 2) created a variant of the SWS manipulation designed to activate a collective rather than relational form of interdependence; however, to our knowledge, they did not test their two versions of the SWS interdependence prime against each other, to see whether they activated significantly different profiles of self-construal. Drawing on Vignoles and colleagues’ (2016) seven-dimensional model, Smith et al. (2013) speculated that

commonly used priming manipulations might activate different aspects of independence and interdependence. They pointed out that SDFP explicitly cues individuals' thoughts of being different or similar to their families and friends, which may weigh more on the dimension of *difference vs. similarity to others*; in contrast, SWS involves a story about an ancient Sumerian general being assigned a commanding role based on talent or based on family loyalty, which is less obviously linked to specific dimensions of independence or interdependence.

Only two previous studies in our knowledge have directly compared different self-construal priming manipulations in a 2 (priming condition: independence vs. interdependence) x 2 (priming task) analysis (Gardner et al., 1999, Study 1; Levine et al., 2003, Priming Study 2). Both studies compared the SWS against a pronoun-circling manipulation, finding in one case that both priming tasks similarly affected the proportion of "interdependent" responses on the TST (Gardner et al.) and in the other case that neither task affected responses to a Likert-type measure of independence and interdependence (Levine et al.). Crucially, however, neither study examined multiple forms of independence and interdependence.

Hence, our second goal was to test whether two commonly used priming tasks (SDFP and SWS) led to equivalent patterns of self-construal activation across the seven dimensions of independence and interdependence (Vignoles et al., 2016). We compared a null hypothesis that different priming methods ought to cue similar patterns of activation across the seven self-construal dimensions (H2₀) against an alternative hypothesis that they would cue different patterns (H2₁).

Do primes work comparably across cultures?

Self-construal priming has been used more extensively in Western than in non-Western cultural contexts (Cross et al., 2011; Oyserman & Lee, 2008). Moreover, since Trafimow and colleagues' (1991) initial research, we know of just one study testing the combined and interactive effects of priming and culture on self-construals, and this study focused on Asian American biculturals rather than a wholly non-Western cultural group (Gardner, Gabriel, & Dean, 2004). Non-equivalent effects of self-construal priming would be potentially problematic. If the goal of self-construal priming is to reproduce cross-cultural differences between Western and Eastern cultures with an experimental manipulation, one would ideally wish to use primes with equivalent meaning across the cultures of interest.

Thus, our third research question was whether each of the priming methods would have a similar pattern of effects among participants residing in a Western (UK) and an Eastern (Chinese) cultural context. We tested a null hypothesis that these primes should be cross-culturally equivalent (H3₀) against an alternative hypothesis that the primes would activate different patterns of self-construal across cultures (H3₁).

Symmetrical or asymmetrical effects?

Even if their meaning is cross-culturally equivalent, primes of independence and interdependence may not necessarily have symmetrical effects in each cultural context. Developing a 'situated cognition' perspective on culture

(Oyserman, 2015), Gardner and colleagues (1999) suggested that individuals in each culture would be chronically affected (or primed) by their cultural contexts and form a 'default' orientation of independence or interdependence. Thus, they would be relatively uninfluenced by situational primes consistent with this orientation, whereas they would respond more strongly to inconsistent primes, activating a 'new' self-construal or suppressing their 'default' one. More generally, situational primes may have more effects on aspects of self-construal with low baseline accessibility than on those with high accessibility (Gardner et al., 2002; Zou, Morris, & Benet-Martínez, 2008). To investigate this, it is necessary to include a control condition with no prime, which many self-construal priming studies did not include (Cross et al., 2011).

Gardner et al. (1999) cued American and Chinese participants with primes that were either consistent or inconsistent with their presumed dominant cultural orientations: Compared to a control condition, participants in both cultural groups who received the 'culturally-inconsistent' primes (i.e. interdependent prime for Americans, independent prime for Chinese) showed a stronger shift in value judgments than those with 'culturally-consistent' primes. Similarly, Sui, Zhu, and Chiu (2007) found that Chinese participants primed with independence significantly differed from those with an interdependent prime or no prime on a self-description task, whereas participants primed with interdependence did not differ from the no-prime group. On the other hand, Norasakkunkit and Kalick (2009) found that European-American participants primed with independence differed significantly from a no-prime group in social anxiety, suggesting that the predominant cultural orientation did not negate the effect of a 'consistent' prime.

Based on these findings, we were interested to explore the interplay between self-construal primes and predominant cultural orientations. We tentatively hypothesized that primes inconsistent with the predominant cultural orientations towards self-construal may have stronger effects. However, we believe that the predominant cultural orientations in each group must be established empirically, and not theorized based on an oversimplistic binary model of East-West differences (Vignoles, 2018). Vignoles et al. (2016) found that Western and Southern/Eastern Asian cultural groups showed significant mean differences on two dimensions of self-construal: difference versus similarity and self-expression versus harmony. On the other five dimensions, differences between these two geo-cultural regions did not reach significance, and the trend on one dimension was in the opposite direction to the stereotypical view of Western and Eastern cultures. Here, we explored systematically for asymmetrical effects of independent and interdependent primes. We did not make strong a priori predictions about which dimensions would show asymmetrical effects. As we detail in the results section, the expected pattern of asymmetrical effects was based on the prevailing models of selfhood that we found in each group, together with the dimensions that turned out to be activated by each priming task.

Present study

We aimed to understand better what self-construal primes manipulate. Our study extends previous research in four ways: First, we used a seven-dimensional self-construal measure (based on Vignoles et al., 2016) to test effects of commonly used self-construal primes across various dimensions of independence and interdependence. Second, we directly compared two different priming tasks,

SDFF and SWS, whereas most previous studies adopted a single task (Oyserman & Lee, 2008).³ Third, we compared the effects of priming in two cultural contexts (UK and China), whereas most previous studies have usually focused on single cultures only (Aaker & Lee, 2001; Briley & Wyer, 2001; Haberstroh, Oyserman, Schwarz, Kühnen, & Ji, 2002; Oyserman & Lee, 2008). Fourth, we added a no-prime control group, so that we could separate the effects of independence and interdependence primes in each group, testing for possible asymmetries. In sum, we tested the following hypotheses:

H1: The priming manipulations would cue all seven dimensions of self-construal equally (H1₀) versus differentially (H1₁);

H2: SDFF and SWS would show similar (H2₀) versus different (H2₁) profiles of effects across the seven self-construal dimensions;

H3: Each of the priming tasks would show similar (H3₀) versus different (H3₁) profiles of effects among UK and Chinese participants;

H4: Compared to the control condition, effects of independence and interdependence primes would be symmetrical (H4₀) versus asymmetrical (H4₁) for each task and in each cultural group.

Method

Participants and procedure

Ethical approval for the study was granted by the Science and Technology Cross-Schools Research Ethics Committee (C-REC) of University of Sussex (ER/SY84/4 and ER/SY84/5).

Undergraduate students at two Chinese and two British universities were invited to participate in a study on “your views about yourself, and your cognition, emotion and motivation”. Participants were required to have been born in the country of administration. The questionnaire was administered in a paper-and-pencil format. Most of the questionnaires were finished in class or under supervision. There was a prize draw of 20 British pounds or 200 Chinese Yuan for the participants in each country. In both countries, we recruited participants mainly through adverts in the library and in class. We initially recruited 592 participants, around half of whom were psychology students. Of these, we excluded 9 participants who did not confirm their country of birth, and another 4 participants (1 British and 3 Chinese) who correctly guessed the purpose of the study. We entered the remaining 579 participants (267 British and 312 Chinese) into preliminary analyses. However, we subsequently realized that many of the British psychology students in our sample had recently received teaching about self-construals and culture-priming. We were concerned that this might contaminate our results, especially as the British psychology students were disproportionately unaffected by self-construal priming in our preliminary analyses. To ensure comparability across cultures, we excluded psychology students in both countries from our main analyses. However, we retained psychology students in our item-selection procedures for the self-construal measure, which relied on participants in the control condition only (see Appendix).

Participants included in our main analyses were 296 undergraduate students of non-psychology majors at two British universities ($n = 118$; 80.5% female; mean age = 21.5 years, $SD = 3.07$) and two Chinese universities ($n = 178$; 56.7%

female; mean age = 21.7 years, SD = 1.27). For all participants, English or Chinese was their first language respectively. Participants' country of birth and ethnic group were collected. All participants were born in the UK or China, respectively. All but one of the British participants reported their ethnicity as Caucasian (n = 117; one participant reported being of mixed ethnicity),⁴ and all Chinese participants reported their ethnicity as Han (n = 178). After excluding psychology students (see above), the most common majors of British participants were History (13.6%), Economics (11.9%), and Philosophy (10.2%), whereas the most common majors of Chinese participants were Education (38.8%), Engineering (28.7%), and English (15.2%).

Participants were randomly assigned to one of five experimental conditions. We applied SDFP and SWS (Trafimow et al., 1991) to prime participants' independence or interdependence, and we also included an empty control group with no prime. Thus, we had five conditions: no priming, independence priming with SDFP, interdependence priming with SDFP, independence priming with SWS, and interdependence priming with SWS. For British participants, the cell sizes in each condition were 20, 21, 25, 20, 32, respectively; while for Chinese participants, the cell sizes were 41, 40, 28, 41, 28, respectively. Although smaller than originally planned, these cell sizes were comfortably in line with those used in most previous self-construal priming research (see Oyserman & Lee, 2008).

British and Chinese participants respectively completed English and Chinese versions of the questionnaire. Materials were originally developed in English. According to the back-translation procedure (Brislin, 1970), one Chinese-English bilingual completed the initial translation (English to Chinese), two Chinese-English bilinguals translated the Chinese version back to a new English version, and one English person and one Chinese-English bilingual compared the two English versions to maximise equivalence and comparability.

Questionnaires

The questionnaires contained 8 tasks. First, participants completed a randomly assigned priming task (except in the control condition). Following four intervening tasks,⁵ they completed a seven-dimensional self-construal scale. Next, participants completed demographic questions. Finally, participants were asked to write down what they thought was the purpose of the study.

Priming conditions

Similarities vs. differences with family and friends task (SDFP: Trafimow et al., 1991). This task asks participants directly to think about themselves in an independent or an interdependent manner. Instructions for priming independence were as follows:

'For the next two minutes, you will not need to write anything. Please think of what makes you different from your family and friends. What do you expect yourself to do?'

Instructions for priming interdependence were as follows:

‘For the next two minutes, you will not need to write anything. Please think of what you have in common with your family and friends. What do they expect you to do?’ (Trafimow et al., 1991, p. 651).

Sumerian warrior story (SWS: Trafimow et al., 1991). This task aims to make independence or interdependence differentially accessible to participants by reading a story about an ancient Sumerian warrior who behaved in an independent or an interdependent fashion, and making a judgement about him. The warrior was described as choosing a commanding officer based on either individual talent or nepotism. The story started as follows:

Sostoras, a warrior in ancient Sumer, was largely responsible for the success of Sargon I in conquering all of Mesopotamia. As a result, he was rewarded with a small kingdom of his own to rule. About 10 years later, Sargon 1 was conscripting warriors for a new war. Sostoras was obligated to send a detachment of soldiers to aid Sargon 1. He had to decide who to put in command of the detachment. After thinking about it for a long time, Sostoras eventually decided on Tiglath who was a...

The independence priming story continued as follows:

. . . talented general. This appointment had several advantages. Sostoras was able to make an excellent general indebted to him. This would solidify Sostoras's hold on his own dominion. In addition, the very fact of having a general such as Tiglath as his personal representative would greatly increase Sostoras's prestige. Finally, sending his best general would be likely to make Sargon I grateful. Consequently, there was the possibility of getting rewarded by Sargon I.

The interdependence priming story continued as follows:

. . . member of his family. This appointment had several advantages. Sostoras was able to show his loyalty to his family. He was also able to cement their loyalty to him. In addition, having Tiglath as the commander increased the power and prestige of the family. Finally, if Tiglath performed well, Sargon I would be indebted to the family.

After the story, participants answered the question “Do you admire Sostoras?” The choices were “yes”, “no”, and “not sure” (Trafimow et al., 1991, p. 652).

Self-construal scale

We measured seven dimensions of independent versus interdependent self-construal using 28 items selected from an initial pool of 52 items. Our measure was adapted from the scale developed by Vignoles et al. (2016, Study 2), aiming to improve reliabilities while including a balance of independent and interdependent items on each subscale. At the time of our study, a definitive new measure was under development, and so we conducted item selection procedures to identify the best performing balanced set of 28 items (four items per subscale) among our British and Chinese participants. Item selection was done using participants in the control condition only ($N = 120$), so as to avoid any possible

confounding of our item selections by effects of the manipulations. We included psychology and non-psychology students for item selection to achieve an adequate sample. Details of the item selection procedure are reported in Appendix.

In our 28-item scale, each of the seven dimensions was measured by four items (2 independent vs. 2 interdependent): self-reliance versus dependence on others (e.g., ‘You prefer to ask other people for help rather than rely only on yourself’); self-containment versus connection to others (e.g., ‘If a close friend or family member is happy, you feel the happiness as if it were your own’); difference versus similarity to others (e.g., ‘You like being similar to other people’); self-interest versus commitment to others (e.g., ‘You value good relations with the people close to you more than your personal achievements’); consistency versus variability (e.g., ‘You act very differently at home compared to how you act in public’); self-direction versus reception to influence (e.g., ‘You prefer to follow your family’s advice on important matters’); and self-expression versus harmony (e.g., ‘You prefer to preserve harmony in your relationships, even if this means not expressing your true feelings’).

Items were presented in a scrambled order and rated on a response scale with five numbered and labelled points from 1 = does not describe me at all to 5 = describes me exactly. To allow for more sensitive measurement than a traditional 5-point response scale without increasing task complexity, we allowed participants to specify intermediate answers if they were undecided between the labelled points (i.e., they could answer 1½, 2½, etc.), resulting in a 9-point scale. We coded responses from 1 to 9, and we reverse-coded independence items, so that each subscale has a theoretical range from 1 (maximum independence) to 9 (maximum interdependence). All dimensions had acceptable reliability (see Appendix).

Demographics

Participants reported their age, gender, country of birth, ethnic group and university major.

Results

Table 1 shows mean scores for the seven dimensions of interdependence (vs. independence) as a function of country and condition. We conducted our main analyses in two stages. The first part of our analyses, addressing H1 to H3, does not include the control condition, because it is already expected that baseline activation of self-construal dimensions will not be equivalent across cultures. The second part of our analyses includes the control condition, in order to address H4.

Table 1. Mean tendencies towards interdependence (vs. independence) as a function of country and priming condition.

Factor	No Priming		Priming with SDFP				Priming with SWS			
			Indep.		Interdep.		Indep.		Interdep.	
	M	(SD)	M	(SD)	M	(SD)	M	(SD)	M	(SD)
UK participants										
Self-reliance vs. Dependence on others	4.72	(1.31)	4.44	(.67)	4.91	(1.05)	4.40	(.86)	4.68	(.94)
Self-containment vs. Connection to others	5.49	(.98)	5.32	(.93)	5.65	(.79)	5.56	(.74)	5.69	(.50)
Difference vs. Similarity to others	3.89	(1.35)	4.22	(1.21)	4.29	(.86)	3.43	(.77)	4.69	(1.30)
Self-interest vs. Commitment to others	5.75	(1.42)	5.93	(1.13)	6.39	(.88)	5.76	(1.34)	6.10	(.75)
Consistency vs. Variability	4.53	(.79)	4.54	(.90)	4.78	(.98)	4.46	(.64)	4.72	(.88)
Self-direction vs. Reception to influence	4.90	(1.24)	4.35	(.64)	4.70	(.87)	3.80	(1.02)	4.55	(1.07)
Self-expression vs. Harmony	4.56	(.54)	4.36	(1.01)	5.22	(.95)	4.88	(.99)	5.12	(.89)
Chinese participants										
Self-reliance vs. Dependence on others	5.14	(1.18)	4.56	(.76)	5.75	(1.02)	4.45	(.96)	5.02	(1.41)
Self-containment vs. Connection to others	6.89	(1.10)	6.28	(1.08)	7.43	(.65)	6.60	(1.13)	6.95	(1.37)
Difference vs. Similar to others	5.12	(1.23)	4.15	(.95)	5.47	(1.24)	4.01	(.83)	5.17	(1.10)
Self-interest vs. Commitment to others	6.28	(1.18)	5.69	(.96)	6.30	(.99)	5.46	(1.04)	6.21	(1.38)
Consistency vs. Variability	5.69	(.77)	4.76	(1.03)	5.87	(1.09)	5.31	(.90)	5.68	(1.29)
Self-direction vs. Reception to influence	5.45	(1.02)	4.33	(.71)	5.72	(.85)	4.56	(.99)	5.26	(1.34)
Self-expression vs. Harmony	6.40	(.97)	5.33	(1.00)	6.14	(1.08)	5.73	(.87)	5.82	(1.19)

Note. Scores have a theoretical range from 1 (maximum independence) to 9 (maximum interdependence). Within each country and priming method, significant differences between independent and interdependent conditions (see Table 2) are highlighted in bold.

Effects of priming across tasks and countries

To test hypotheses H1 to H3, we initially applied a 7 (within-subjects: seven self-construal dimensions) \times 2 (priming condition: independence vs. interdependence), \times 2 (priming task: SDFP vs. SWS) \times 2 (country: UK vs. China) ANCOVA, with gender as covariate.⁶ We found significant main effects of self-construal dimension, $F(6,215) = 12.34$, $p < .001$, $\eta_p^2 = .05$; priming condition, $F(1,215) = 63.43$, $p < .001$, $\eta_p^2 = .23$; and country, $F(1,215) = 55.15$, $p < .001$, $\eta_p^2 = .20$, but no significant main effect of priming task, $F(1,215) = 1.61$, $p = .21$, $\eta_p^2 = .01$.

Crucially, a significant two-way interaction between priming condition and self-construal dimension, $F(6,215) = 2.20$, $p = .04$, $\eta_p^2 = .01$, shows that not all self-construal dimensions were equally affected by priming, supporting H1₁ over H1₀. A significant three-way interaction of priming condition \times priming task \times self-construal dimension, $F(6,215) = 3.09$, $p = .01$, $\eta_p^2 = .01$, indicates that the two priming tasks differentially affected the various self-construal dimensions, thus supporting H2₁ over H2₀. A significant two-way interaction of priming condition \times country, $F(1,215) = 6.32$, $p = .01$, $\eta_p^2 = .03$, further qualified by a marginal three-way interaction of priming condition \times priming task \times country, $F(1,215) = 3.18$, $p = .08$, $\eta_p^2 = .02$, indicates that the priming tasks did not have equivalent effects across the two cultural groups, providing initial support for H3₁ over H3₀. The four-way interaction among priming condition, priming task, country and self-construal dimension did not reach significance, $F(6,215) = 1.08$, $p = .38$, $\eta_p^2 = .01$.

To investigate the pattern of effects involving priming condition and country, we split the data by priming tasks and conducted separate MANCOVAs, predicting the seven factors of self-construal, with priming condition and country as between-subjects factors and gender as covariate. The multivariate interaction effect of priming condition \times country was significant for SDFP, $F(7,97) = 3.71$, $p = .001$, $\eta_p^2 = .21$, supporting H3₁, but not significant for SWS, $F(7,105) = .28$, $p = .96$, $\eta_p^2 = .02$, supporting H3₀. Thus, effects of the SWS task did not differ significantly across countries whereas effects of the SDFP task were non-equivalent.

To unpack these results further, we split the sample by priming task and country. For each country and priming task, we conducted separate MANCOVAs, predicting the seven dimensions of self-construal, with priming condition as between-subjects factor and gender as covariate, to detect which aspects of self-construal were significantly influenced by the priming. Univariate effects of priming condition from these four analyses are summarized in Table 2. When using the SDFP task, there were significant multivariate effects of priming for British participants, $F(7,33) = 2.50$, $p = .04$, $\eta_p^2 = .35$, and for Chinese participants, $F(7,57) = 15.34$, $p < .001$, $\eta_p^2 = .65$. Only one dimension (self-expression vs. harmony) showed a significant difference for British participants, whereas all seven dimensions of self-construal showed significant differences for Chinese participants (see Table 2). All significant differences were in the expected direction (see Table 1 for means). When using the SWS task, there were significant multivariate effects of priming for British participants, $F(7,42) = 4.42$, $p = .001$, $\eta_p^2 = .42$, and for Chinese participants, $F(7,56) = 4.79$, $p < .001$, $\eta_p^2 = .38$. In both countries, just two dimensions (*difference vs. similarity to others and self-direction vs. reception to influence*) showed significant differences across priming conditions (see Table 2). These differences were also in the expected direction (see Table 1 for means).

Table 2. Univariate results from four MANCOVAs comparing the 7 dimensions of self-construal across independent and interdependent priming conditions, controlling for gender, among UK and Chinese participants and with SDFP or SWS priming methods.

Factor	SDFP			SWS		
	F	Sig.	η_p^2	F	Sig.	η_p^2
UK participants						
Self-reliance vs. Dependence on others	2.45	.13	.06	1.62	.21	.03
Self-containment vs. Connection to others	1.82	.18	.04	.38	.54	.01
Difference vs. Similarity to others	.47	.50	.01	23.28	***	.33
Self-interest vs. Commitment to others	2.31	.14	.06	1.13	.29	.02
Consistency vs. Variability	.64	.43	.02	.95	.33	.02
Self-direction vs. Reception to influence	2.01	.16	.05	7.03	**	.13
Self-expression vs. Harmony	7.64	**	.16	.50	.48	.01
Chinese participants						
Self-reliance vs. Dependence on others	35.18	***	.36	2.11	.15	.03
Self-containment vs. Connection to others	17.62	***	.22	.82	.37	.01
Difference vs. Similarity to others	25.77	***	.29	16.03	***	.21
Self-interest vs. Commitment to others	8.21	**	.12	3.77	.06	.06
Consistency vs. Variability	14.55	***	.19	1.35	.25	.02
Self-direction vs. Reception to influence	42.92	***	.41	3.88	*	.06
Self-expression vs. Harmony	8.48	**	.12	.11	.74	.01

Note. * $p < .05$ (2-tailed). ** $p < .01$ (2-tailed). *** $p < .001$ (2-tailed).

Baseline cultural orientations

Prior to testing H4, we wanted to characterize the baseline cultural orientations in our two samples. Table 1 shows the mean tendencies on each self-construal dimension for participants in the control condition. We compared these means using a one-way MANCOVA, with country as between-subjects factor and gender as covariate. The results show a significant multivariate effect of country, $F(7,46) = 11.63$, $p < .001$, $\eta_p^2 = .64$. Relative to each other, British and Chinese participants differed significantly on five dimensions—*self-containment versus connectedness to others*, *difference versus similarity to others*, *consistency versus variability*, *self-direction versus reception to influence*, and *self-expression versus harmony*—whereas they did not differ significantly in *self-reliance versus dependence on others*, nor on *self-interest versus commitment to others* (see Table 3).

Table 3. Results of analyses comparing UK and Chinese participants' self-construals in the control condition against each other (univariate results from MANCOVA controlling for gender) and against the theoretical mid-point (t-tests).

Factor	UK vs. China MANCOVA			UK t-test		China t-test	
	F	Sig.	η_p^2	t	Sig.	t	Sig.
Self-reliance vs. Dependence on others	2.89	.10	.05	-1.38	.18	1.03	.31
Self-containment vs. Connection to others	19.05	***	.27	2.46	*	11.53	***
Difference vs. Similarity to others	11.12	**	.18	-3.88	***	.58	.56
Self-interest vs. Commitment to Others	1.82	.18	.03	2.61	*	7.30	***
Consistency vs. Variability	26.67	***	.34	-2.77	**	3.69	***
Self-direction vs. Reception to influence	5.15	*	.09	-.23	.82	3.06	**
Self-expression vs. Harmony	53.72	***	.51	-3.03	**	8.20	***

Note. * $p < .05$ (2-tailed). ** $p < .01$ (2-tailed). *** $p < .001$ (2-tailed).

To characterize absolute levels of independence and interdependence on each dimension among control participants within each cultural group, Table 3 also reports t-tests using the theoretical midpoint of the self-construal scale (5) as the test value. British control participants tended significantly towards the independent pole of three dimensions—*difference (vs. similarity to others)*, *consistency (vs. variability)*, and *self-expression (vs. harmony)*. However, they tended towards the interdependent pole of two other dimensions—*connectedness to others (vs. self-containment)*, and *commitment to others (vs. self-interest)*—and they scored close to the theoretical midpoint on *self-reliance versus dependence on others* and on *self-direction versus reception to influence*. Chinese control participants tended towards the interdependent pole of five dimensions—*connectedness to others (vs. self-containment)*, *commitment to others (vs. self-interest)*, *variability (vs. consistency)*, *reception to influence (vs. self-direction)*, and *harmony (vs. self-expression)*—whereas they scored close to the theoretical midpoint on *difference versus similarity* and *self-reliance versus dependence on others*.

In sum, only two of the seven self-construal dimensions showed a pattern clearly supporting the common assumption that British participants would emphasize independence (here, *self-expression* and *consistency*) whereas Chinese participants would emphasize interdependence (here, *harmony* and *variability*). Other dimensions showed a more complex pattern: Both groups emphasized *commitment to others over self-interest*, and both emphasized *connectedness to others over self-containment*, with the latter tendency stronger among Chinese participants. Chinese participants more strongly emphasized reception to influence, but the British did not emphasize *self-direction*; British participants more strongly emphasized difference, but the Chinese did not emphasize similarity. Both groups scored close to the theoretical midpoint on *self-reliance versus dependence on others*. We refined our theoretical predictions regarding H4 in light of this complex pattern (see below).

Separating the effects of independence and interdependence primes

Table 4 reports pairwise comparisons of the mean scores on each self-construal dimension in the independent and interdependent conditions for each priming task against the control condition in each country. Additionally, as a formal test of the symmetry or asymmetry of these effects (H4), we report a focal contrast comparing the control condition to the average across the two experimental conditions for each priming task in each country. If independence and interdependence primes have symmetrical opposing effects on a given dimension, the mean for the control condition should be close to the average of the two primed conditions, and the focal contrast would be close to zero (H4₀). A significant focal contrast therefore indicates that the effects of the two primes are significantly asymmetrical (H4₁). Theoretically, we would expect to see asymmetrical effects on self-construal dimensions where the priming manipulation influences that dimension (see Table 2) AND there is already a clear pre-existing cultural tendency (see Table 3).

Table 4. Pairwise comparisons of primed conditions with the control condition, and focal contrast comparing the control condition to the mean of the two primed conditions, separately among UK and Chinese participants with SDFP or SWS priming tasks

	SDFP						SWS					
	Indep. vs.		Interdep. vs.		Focal		Indep. vs.		Interdep. vs.		Focal	
	control		control		contrast ^a		control		control		contrast ^a	
	Diff.	Sig.	Diff.	Sig.	Diff.	Sig.	Diff.	Sig.	Diff.	Sig.	Diff.	Sig.
UK participants												
Self-reliance vs. Dependence on others	.30	.39	-.15	.66	.08	.80	.33	.32	.02	.96	.17	.54
Self-containment vs. Connection to others	.13	.65	-.22	.42	-.04	.86	-.08	.72	-.18	.40	-.13	.51
Difference vs. Similarity to others	-.46	.08	-.62	**	-.54	*	.42	.12	-.66	**	-.12	.59
Self-interest vs. Commitment to Others	-.21	.58	-.69	.06	-.45	.17	-.02	.95	-.33	.33	-.17	.58
Consistency vs. Variability	-.03	.92	-.28	.33	-.16	.55	.06	.83	-.16	.49	-.05	.81
Self-direction vs. Reception to influence	.59	.06	.26	.38	.42	.11	1.12	**	.31	.34	.71	*
Self-expression vs. Harmony	.20	.51	-.66	*	-.23	.35	-.33	.21	-.52	*	-.43	.06

	SDF						SWS					
	Indep. vs.		Interdep. vs.		Focal		Indep. vs.		Interdep. vs.		Focal	
	control		control		contrast ^a		control		control		contrast ^a	
	Diff.	Sig.	Diff.	Sig.	Diff.	Sig.	Diff.	Sig.	Diff.	Sig.	Diff.	Sig.
	Chinese participants											
Self-reliance vs. Dependence on others	.74	***	-.76	**	-.01	.95	.44	.10	.13	.66	.29	.23
Self-containment vs. Connection to others	.57	*	-.51	*	.03	.88	.28	.34	-.06	.84	.11	.67
Difference vs. Similarity to others	1.10	***	-.47	.10	.32	.17	.90	***	-.04	.89	.43	*
Self-interest vs. Commitment to Others	.64	**	-.05	.86	.30	.18	.76	**	.08	.80	.42	.10
Consistency vs. Variability	.96	***	-.21	.40	.37	.06	.32	.18	.01	.96	.16	.42
Self-direction vs. Reception to influence	1.17	***	-.32	.15	.42	*	.75	**	.19	.49	.47	*
Self-expression vs. Harmony	1.08	***	.25	.34	.66	**	.66	**	.58	*	.62	**

Note. * $p < .05$ (2-tailed). ** $p < .01$ (2-tailed). *** $p < .001$ (2-tailed). Values in bold are those for which asymmetrical effects are predicted (see main text). a Focal contrast comparing the control condition to the mean of the two primed conditions.

For British participants responding to the SDFF, the only dimension affected by the manipulation was *self-expression versus harmony* (Table 2) and there was evidence of a prior tendency towards *self-expression* (Table 3). As shown in Table 4, the interdependence prime resulted in a significant shift towards the *harmony* pole on this dimension, whereas participants primed with independence did not differ significantly from those in the control condition. This pattern of results is consistent with H4₁. However, the focal contrast did not show a significantly asymmetrical pattern of effects, and so the support for H4₁ is equivocal. Unexpectedly, Table 4 additionally reveals that both SDFF conditions shifted British participants towards similarity rather than difference, compared to the control condition.

For Chinese participants responding to the SDFF, all seven dimensions were affected by the manipulation (Table 2), and there were significant prior tendencies towards *connection to others*, *harmony*, *commitment to others*, *variability*, and *reception to influence* (Table 3). As shown in Table 4, the independence prime resulted in a significant shift towards the independent pole of all seven dimensions, whereas the interdependence prime resulted in a shift towards the interdependent pole on just two dimensions: *dependence on others* (for which there was no prior cultural tendency) and *connection to others* (for which there was a strong prior cultural tendency). This pattern of results is broadly, but not perfectly, consistent with H4₁. For three of the five dimensions with a clear baseline tendency towards interdependence, the focal contrast showed a significantly (or in one case marginally) asymmetrical pattern of effects, providing partial support for H4₁.

For participants in both countries responding to the SWS task, only *difference versus similarity* and *self-direction versus reception to influence* were significantly affected by the manipulation (Table 2). British participants showed a significant baseline tendency towards *difference* but not towards *self-direction* (Table 3). Consistent with H4₁, the interdependent prime shifted British participants towards *similarity*, whereas the independent prime did not significantly shift British participants towards *difference*; however, the focal contrast testing H4₁ for this dimension did not reach significance. Unexpectedly, the independent prime shifted British participants significantly towards *self-direction*, whereas the interdependent prime did not shift them significantly towards *reception to influence*; in this case, the focal contrast indicated that the pattern was significantly asymmetrical, but the pattern of the asymmetry is the reverse of that predicted by H4₁.

Of the two dimensions influenced by the SWS task (Table 2), Chinese participants showed a significant baseline tendency towards *reception to influence*, but not towards similarity (Table 3). Consistent with H4₁, the independent prime shifted Chinese participants towards self-direction, whereas the interdependent prime did not significantly shift them towards reception to influence; moreover, the focal contrast showed significantly asymmetrical effects on this dimension, supporting H4₁ over H4₀. Additionally, the independent prime shifted Chinese participants towards *difference*, whereas the interdependent prime did not significantly shift them towards *similarity*, and the focal contrast again showed a significantly asymmetrical pattern of effects. Unexpectedly, Table 4 also reveals that both independent and interdependent priming conditions shifted Chinese participants towards self-expression rather than harmony, compared to participants in the control condition.

Discussion

Questioning the conventional interpretation of self-construal primes

Self-construal primes are commonly used to unpackage cross-cultural differences in psychological processes and outcomes, but this approach is based on several rarely tested assumptions. Researchers usually assume that individualism/independence and collectivism/interdependence are coherent ‘mindsets’ that are chronically available but differentially accessible in different cultural contexts. Moreover, they assume that these mindsets can be activated equivalently using different priming tasks and among different cultural groups, and that the effects of experimental priming will largely ‘mimic’—and thus can be used to explain—the effects of chronic accessibility in different cultural environments (e.g., Oyserman, 2015).

Our current findings challenge these assumptions in several important ways. Self-construal priming did not affect all dimensions of independence and interdependence equally (H1₁), two different priming tasks cued a different subset of self-construal dimensions (H2₁), and one task had highly different effects across the two cultural groups (H3₁). Nor did any of the patterns of activation we found across tasks and groups (Table 2) closely mimic the pattern of differences in chronic accessibility among unprimed participants from each group (Table 3). Using these primes to reveal the mechanisms underlying observed cross-cultural differences seems to be more problematic than has often been thought.

The closest we found to a comprehensive manipulation of independent versus interdependent self-construal was the SDFP task among Chinese participants. Independent and interdependent SDFP priming conditions delivered the expected pattern of differences across all seven self-construal dimensions in this cultural group. However, this task was largely ineffective among British participants, yielding a significant difference on only one dimension: *self-expression versus harmony*. Asking British participants to think what made them different from family and friends led to a marginal increase in perceived *similarity* to others—seemingly a backfire effect whereby participants reacted against the content of the prime.

The closest to a culturally-invariant manipulation was the SWS task, which activated differences on two specific dimensions—*difference versus similarity* and *self-direction versus reception to influence*—in both cultural groups. However, in both groups, independence-primed and interdependence-primed participants did not differ significantly on the other five dimensions (Table 2). Nor did these effects mimic the pattern of pre-existing cross-cultural differences: The two dimensions activated by SWS were those that showed the weakest of the five cross-cultural differences that we found in the control condition (Table 3). Giving further cause for concern, both priming conditions unexpectedly led to an increase in *self-expression* (*vs. harmony*) compared to the control condition among Chinese participants, whereas we observed a tendency in the opposite direction for British participants (Table 4).

The different patterns of self-construal activation for different priming tasks and different cultural groups could help explain why self-construal priming studies have sometimes yielded inconsistent effects on outcome variables (Oyserman & Lee, 2008). Nevertheless, our findings support the foundational assumption of these studies that aspects of self-construal can be activated by situational primes (Brewer & Gardner, 1996; Gardner et al., 1999; Trafimow et

al., 1991). Moreover, where priming was effective, we usually found the asymmetrical patterns of effects compared to the control condition that would be predicted from a ‘situated cognition’ perspective on culture (Oyserman, 2015)—and around half of the relevant focal contrasts reached statistical significance (see Table 4). Hence, we emphatically do not wish to suggest that researchers should abandon the use of self-construal priming in cultural psychology; however, we recommend that much more careful attention is needed to develop accurately targeted priming tasks, and to test these tasks across groups of participants with chronic exposure to diverse cultural contexts.

Implications for future research

Towards that goal, our research offers several potentially valuable insights: First, we believe that it may not be viable to prime monolithic constructs of individualism/independence versus collectivism/interdependence. Both individualism versus collectivism and independence versus interdependence are now thought to be highly complex and only partially overlapping constructs, composed of multiple dimensions that can vary independently both across and within cultures (e.g., Brewer & Chen, 2007; Triandis, 1993; Vignoles, 2018; Vignoles et al., 2016). Hence, we suspect that these constructs are too broad and multifaceted to be captured adequately by any simple priming task. Instead, we recommend targeting priming manipulations at specific dimensions of self-construal, or at other theorized components of individualism-collectivism such as particular personhood beliefs or values. Such targeted priming manipulations, together with the use of finer-grained measures of cultural orientation, will help to provide a more precise understanding of the role of self-construal processes in explaining cross-cultural differences.

Here, two of the most commonly used self-construal priming tasks in the literature—SDFP and SWS—provided a rather messy picture, in terms of which aspects of self-construal they activated. The commonly used pronoun-circling task is also limited because it may not be suitable for use in some languages (see Footnote 3). Hence, we suggest that future researchers would be best advised to develop new priming tasks to target the dimensions of cultural orientation (or combinations of dimensions) that are of theoretical interest for their studies.

Our results suggest that subtler priming tasks such as the SWS potentially may have more comparable effects on self-construal across cultures, whereas explicit tasks such as the SDFP may sometimes be ineffective or even backfire. Priming research in other domains has also shown that subtle primes can often be more effective than explicit primes, especially when participants might react against the influence of an explicit message (e.g., Hess, Hinson, & Statham, 2004; Shih, Ambady, Richeson, Fujita, & Gray, 2002; Williams, Bargh, Nocera, & Gray, 2009). This suggests that future researchers might focus on subtle priming techniques when developing new self-construal manipulations. For example, sentence unscrambling tasks (e.g., Kühnen & Hannover, 2000) could be adapted to deliver subtle primes focusing precisely on specific dimensions of self-construal and not others.

Crucially, researchers should not assume that any self-construal priming task will function equivalently in different cultural contexts without checking this first. Our results show that the effects of these primes do not necessarily generalize across cultural contexts. Hence, it would be unwise to extrapolate the current pattern of effects of SDFP and SWS beyond the groups that we studied

here. Self-construal priming researchers should routinely include manipulation checks in their studies, or they should test their manipulations in separate studies among members of their target populations. We advocate using fine-grained measures of cultural orientation—such as the seven-dimensional self-construal scale used here—to provide a more complete and nuanced picture of what is activated by a given priming task.

Similarly, when comparing cultural groups, researchers should measure, rather than assume, whether the theorized cultural differences in chronic activation are present. Vignoles et al. (2016) demonstrated that different ways of being independent and interdependent are emphasized in different cultures. Even if a cultural model of selfhood is predominantly independent or interdependent, profiles of self-construal can be quite complex and dynamic. For instance, Vignoles et al. (2016) found that on the dimension of *self-interest vs. commitment to others*, individualist cultural samples tended to be more interdependent than collectivist cultural samples. Here, unprimed Chinese participants showed an absolute tendency towards interdependence on five self-construal dimensions, but not the other two; unprimed British participants, in contrast, tended towards independence on only three dimensions and tended towards interdependence on another two dimensions. Thus, the seven dimensions of self-construal do not necessarily go together across cultures.

Conclusion

Self-construal primes have been widely used in cultural psychology, but what exactly they activate has not been tested adequately in previous research. Applying two commonly used priming tasks (SDFF and SWS) to members of two cultural groups (the UK and China), we found that the patterns of self-construal triggered by these primes were more complicated than what researchers may have expected. Our findings suggest that researchers should be careful in their choices of self-construal priming methods, and routinely use manipulation checks to confirm what the primes are activating. Rather than assuming that individualism-collectivism or independence-interdependence can be activated as a whole, it may be desirable to develop more narrowly targeted primes. In this way, the connectedness or otherwise of multiple facets of these broad cultural dimensions in the minds of individuals can become an empirical question, rather than an axiomatic assumption.

Endnotes

¹ These manipulations have been inconsistently labelled in the literature as self-construal primes or individualism and collectivism primes (Gardner et al., 1999; Suh et al., 2008; Trafimow et al., 1991). The two manipulations used in the current study were originally developed to cue “private self” and “collective self”, which were seen as aspects of the broader cultural contrast between individualism and collectivism (Trafimow et al., 1991). As “cultural syndromes” (Triandis, 1993), individualism and collectivism encompass numerous differences across psychological domains including beliefs, values, and practices (Brewer & Chen, 2007; Vignoles et al., 2016), and it seems doubtful that a single priming method

would cue all of these domains at once. Thus, we prefer the more precise term “self-construal primes” here.

² Others have used a manipulation check to ensure compliance with the task, but not to check what was activated (e.g., Oyserman, Sorensen, Reber, & Chen, 2009).

³ Considering the number of participants needed for each group, we included two priming methods in our study, resulting in five experimental conditions. SDFP and SWS are two of the three most commonly used self-construal priming methods (Oyserman & Lee, 2008). Also commonly used is the pronoun-circling task, but this method may seem rather unnatural in languages such as Chinese, where pronouns are frequently omitted from sentences. Because pronoun drop is more common in collectivist cultures (Kashima & Kashima, 1998), the pronoun-circling task may be most suitable for use in individualist cultures.

⁴ Ethnic group was not treated as an exclusion criterion in this study. However, the requirement that participants were born in the country of administration perhaps may have led some British-born ethnic minority participants to self-select out of the sample.

⁵ The four tasks measured engaging and disengaging emotions (Kitayama, Park, Sevincer, Karasawa, & Uskul, 2009), face motivation (Hwang, Francesco & Kessler, 2003), inclusion of others in the self (Aron, Aron, & Smollan, 1992), and value priorities (Lindeman & Verkasalo, 2005).

⁶ In this study, age and gender were not our research interest. We included gender as a covariate considering the uneven number of male and female participants in each country.

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Appendix: Item selection procedures for self-construal scale

Participants

We analyzed data from 120 participants (55 British and 65 Chinese) who were assigned to the control condition. For these analyses, we did not exclude psychology students. Instead, we excluded participants from the four experimental conditions, to avoid the possibility that priming effects on particular items would influence our choice of items, leading to a possible circularity affecting our findings. Participants were 55 British (76.4% female; mean age = 21.1; SD = 2.68), and 65 Chinese (44.6% female; mean age = 23.0; SD = 1.26).

Item pool

The initial item pool consisted of 52 items, of which 46 items were designed to measure the seven theorized self-construal dimensions (see Table S1). We included a roughly equal proportion of independent and interdependent items for each factor to help remove the effect of acquiescent responding. Because a new version of the scale was under development, we conducted item selection procedures. All the items were presented in a scrambled order and rated on a 9-point response scale with five numbered and labelled points from 1 = does not describe me at all to 5 = describes me exactly. To reduce task complexity, while allowing for more sensitive measurement than a traditional 5-point response scale, we allowed participants to specify intermediate answers if they were undecided between the labelled points (i.e., they could answer 1½, 2½, etc.), resulting in a 9-point response scale.

Item selection procedure

We conducted a Random Intercept Exploratory Factor Analysis (RI-EFA; Aichholzer, 2014) with a target rotation based on the 7-factor self-construal model using Mplus software (Muthén & Muthén, 1998-2010). As well as the seven substantive factors, we modelled a random intercept, which loaded on each indicator with a fixed value of 1, to adjust for the influence of acquiescent responding (Vignoles et al., 2016; Welkenhuysen-Gybels, Billiet, & Cambré, 2003). Cultural group was entered as a predictor of all seven self-construal dimensions and the random intercept. We used values of Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR) and Comparative Fit Index (CFI) to assess the model fit. For the initial pool of 46 items, values of RMSEA and SRMR were acceptable, although CFI was below its traditional cut-off of .9: $\chi^2 = 1285.217$, $df = 771$, $p < .001$, RMSEA = .075 (90% CI [.067, .082]), SRMR = .046, CFI = .832 (Hu & Bentler, 1999; Kline, 2005; but the lower CFI may be acceptable: see Kenny & McCoach, 2003).

From this initial analysis, we selected the best performing items to create a 28-item scale, with a balanced set of 4 items (2 interdependent items and 2 independent items) measuring each factor. To do this, we removed 18 items based on factor loadings ($< .30$), modification indices (> 100), and conceptual

considerations (maintaining balance, avoiding redundancy). For the 28-item model, all fit indices were acceptable: $\chi^2 = 331.825$, $df = 222$, $p < .001$, RMSEA = .064 (90% CI [.049, .078]), SRMR = .034, CFI = .928.

Scoring and reliabilities

To compute the reliability of observed scores, we first removed variance due to response style from the items by centering each participant's raw ratings around their mean rating across the entire pool of 52 items. We reversed the adjusted ratings for the independent items on each subscale, so that higher scores on each subscale would signify greater interdependence. Reliabilities for all seven factors were acceptable for our validation sample and for our main sample in both countries (see Table S2). Because each subscale included an equal number of independent and interdependent items, the observed scores using raw or participant-mean centered ratings will be perfectly correlated. For our main analyses, we used the raw ratings, so that means would be interpretable on the 1 to 9 response scale.

Table A1. Standardized factor loadings for all self-construal items in our RI-EFA analyses.

Item wording	46-item model								28-item model							
	I	II	III	IV	V	VI	VII	RI	I	II	III	IV	V	VI	VII	RI
Self-reliance vs. Dependence on others																
Being able to depend on others is very important to you.	-.86	-.01	.01	.02	.07	.05	.01	.15	.88	.21	.04	<.01	.05	-.16	.13	.18
You prefer to ask other people for help rather than rely only on yourself.	-.56	-.05	.06	.10	-.05	-.37	.28	.17	.71	-.10	.13	.07	.06	.06	-.11	.20
You feel uncomfortable in situations where you are dependent on others.	.48	.04	.14	.04	.16	.18	.01	.15	-.46	.06	.13	-.05	.15	-.09	-.05	.18
You tend to rely on yourself rather than seeking help from others.	.51	.25	.20	.12	-.07	.17	.03	.14	-.43	.16	.17	.09	.08	-.22	.10	.16
You try to avoid being reliant on others.	.46	.34	.10	.04	.20	.30	.05	.14								
You feel comfortable to depend on the people close to you.	-.81	.18	<.01	.12	-.09	-.05	.06	.15								
Self-containment vs. Connection to others																
If a close friend or family member is happy, you feel the happiness as if it were your own.	-.15	.84	.01	.05	-.03	.21	.01	.15	<.01	.96	.01	.04	.05	-.02	-.01	.19
If a close friend or family member is sad, you feel the sadness as if it were your own.	-.15	.84	.07	.01	.10	.04	.03	.18	.05	.88	.06	<.01	.07	.09	.04	.21
You would not feel personally insulted if someone insulted	.09	-.69	-.01	.08	.05	-.24	.03	.14	.05	-.73	.02	.09	.06	.08	.05	.17

Item wording	46-item model								28-item model							
	I	II	III	IV	V	VI	VII	RI	I	II	III	IV	V	VI	VII	RI
a member of your family. Your happiness is independent from the happiness of your family.	.14	-.36	.16	.18	.01	.12	.18	.14	-.01	-.29	.18	-.21	.03	-.25	-.09	.17
Your personal view of yourself does not depend on your family or friends.	<.01	-.64	.11	.04	.07	.13	.13	.16								
If a close friend or family member had an important success or failure, your view of yourself would remain the same.	-.24	-.56	.04	.12	<.01	.52	.31	.17								
You would feel personally shamed if a close friend or family member did something shameful.	.41	.83	-.01	.01	-.11	-.06	.08	.17								
Your view of yourself does not depend on your family's reputation.	-.24	-.55	.08	.06	.08	.39	.16	.16								
Difference vs. Similarity to others																
You like being different from other people.	.13	-.26	.74	.08	.01	-.11	.17	.15	-.05	-.21	.81	.11	.01	.06	.18	.18
You see yourself as different from most people.	.01	-.03	.69	.05	-.03	-.06	.01	.17	-.04	.05	.68	-.05	.02	.08	<.01	.20
You would rather be the same as others than be different.	.09	-.06	-.75	.08	-.08	.01	.16	.16	-.04	-.09	.77	.06	.08	.02	.12	.20
You like being similar to other people.	.07	.06	-.70	.07	.02	-.11	.21	.15	<.01	-.05	.67	.05	.01	.06	.23	.18

Item wording	46-item model								28-item model							
	I	II	III	IV	V	VI	VII	RI	I	II	III	IV	V	VI	VII	RI
You see yourself as unique and different from others.	-.03	<.01	.76	.06	.02	.01	.11	.17								
Being different from others makes you feel uncomfortable.	-.10	-.09	-.74	.03	.06	.07	.12	.18								
Self-interest vs. Commitment to others																
You would sacrifice your personal interests for the benefit of your family.	.06	-.03	-.01	.79	-.16	-.18	.09	.16	.01	-.05	.08	.78	.11	.15	-.14	.19
You look after the people close to you, even if it means putting your personal needs to one side.	-.09	.09	.03	.66	.09	.15	.07	.16	-.01	.25	.05	.64	.10	-.01	-.14	.20
You protect your own interests, even if it might sometimes disrupt your family relationships.	-.12	.10	.14	.64	.12	-.01	.06	.15	.04	.17	.09	-.66	.08	.12	-.04	.19
You value personal achievements more than good relations with the people close to you.	.23	.04	.10	.59	-.12	-.17	.03	.15	-.11	-.09	.10	-.57	.16	.16	-.02	.18
You usually give priority to your personal goals, before thinking about the goals of others.	.08	.11	-.05	.59	-.10	-.02	.18	.17								
You usually give priority to others, before yourself.	.11	.10	.13	.64	<.01	-.08	.21	.18								
Your own success is very important to you, even if it disrupts your	.08	-.18	.02	.59	-.10	-.11	.05	.17								

Item wording	46-item model								28-item model							
	I	II	III	IV	V	VI	VII	RI	I	II	III	IV	V	VI	VII	RI
friendships.																
Consistency vs. Variability																
You see yourself differently when you are with different people.	.03	.10	.01	.09	-.82	.24	.05	.17	-.08	.15	.02	.08	.87	-.08	.03	.21
You behave differently when you are with different people.	-.01	-.11	.07	.07	-.84	.02	.11	.17	.13	-.13	.09	.04	.86	-.11	.19	.20
You see yourself the same way even in different social environments.	<.01	.01	.02	.12	.74	-.07	.11	.16	.06	-.02	.05	.14	.72	-.09	.21	.19
You behave in the same way even when you are with different people.	.09	-.02	.07	.03	.69	.04	.11	.14	-.09	<.01	.08	.04	.63	-.07	.13	.17
You always see yourself in the same way even when you are with different people.	.27	.06	.06	.04	.62	<.01	.17	.15								
You act very differently at home compared to how you act in public.	.05	.25	.07	.05	-.58	-.04	.24	.17								
Self-direction vs. Reception to influence																
You usually ask your family for approval before making a decision.	-.13	.14	-.01	.03	-.03	-.49	.40	.16	-.03	.02	.07	.04	.07	.86	.22	.19
You prefer to follow your family's advice on important matters.	-.23	.24	.07	.02	.06	-.43	.27	.15	.04	.18	.06	.07	.03	.70	.08	.18
You usually decide on your own actions,	.16	-.19	.06	.20	-.01	.47	.05	.15	-.08	-.06	.03	.22	.01	-.56	.15	.18

Item wording	46-item model								28-item model							
	I	II	III	IV	V	VI	VII	RI	I	II	III	IV	V	VI	VII	RI
rather than follow others' expectations.																
You prefer to do what you want without letting your family influence you.	.22	.13	.11	.10	-.22	.37	.07	.16	-.11	.19	.10	.07	.23	-.44	.21	.19
You decide for yourself what goals to pursue even if they are very different from what your family would expect.	.16	-.07	-.05	.13	-.10	.49	-.07	.16								
You usually follow others' advice when making important choices.	-.33	.20	.12	.06	.02	-.30	.20	.17								
You always make your own decisions about important matters, even if others might not approve of what you decide.	.29	.14	.04	.05	.02	.32	-.05	.15								
Self-expression vs. Harmony																
You prefer to preserve harmony in your relationships, even if this means not expressing your true feelings.	.12	<.01	-.06	-.02	.13	-.06	.98	.14	-.08	-.05	-.03	-.02	-.09	.11	.98	.17
You try to adapt to people around you, even if it means hiding your feelings.	-.01	-.04	-.13	-.03	.11	.14	.79	.16	.05	.04	-.08	-.02	-.09	-.12	.84	.20
You prefer to express your thoughts and feelings openly,	-.05	-.13	-.02	.02	.04	.04	-.08	.13	<.01	-.08	-.02	.04	-.08	<.01	-.65	.16

Item wording	46-item model								28-item model							
	I	II	III	IV	V	VI	VII	RI	I	II	III	IV	V	VI	VII	RI
even if it may sometimes cause conflict.																
You think it is good to express openly when you disagree with others.	.03	.06	<.01	.11	.05	.20	<i>.57</i>	.14	-.12	.08	<i>.02</i>	.10	<i>.02</i>	-.08	-.52	.17
You try not to express disagreement with members of your family.	<.01	-.21	-.01	.05	-.03	-.09	.89	.15								
You show your true feelings even if it disturbs the harmony in your family relationships.	-.01	.05	-.02	<i>.05</i>	.12	.06	<i>.68</i>	.13								

Note. Factor I represents the dimension of Self-reliance vs. Dependence on others; Factor II represents the dimension of Self-containment vs. Connection to others; Factor III represents the dimension of Difference vs. Similarity to others; Factor IV represents the dimension of Self-interest vs. Commitment to others; Factor V represents the dimension of Consistency vs. Variability; Factor VI represents the dimension of Self-direction vs. Reception to influence; and Factor VII represents the dimension of Self-expression vs. Harmony. Figures with italic mean $p < .05$ (2-tailed); figures with bold mean $p < .01$ (2-tailed); and figures with italic and bold mean $p < .001$ (2-tailed).

Table A2. Reliabilities (Cronbach's α) of each factor in the 28-item Self-Construal Scale for British and Chinese participants in the item selection sample and in the main sample.

Factor	Item selection sample		Main sample	
	UK	China	UK	China
Self-reliance vs. Dependence on others	.81	.65	.72	.78
Self-containment vs. Connection to others	.75	.72	.64	.79
Difference vs. Similar to others	.82	.81	.82	.83
Self-interest vs. Commitment to Others	.74	.78	.80	.77
Consistency vs. Variability	.87	.72	.68	.78
Self-direction vs. Reception to influence	.77	.71	.76	.74
Self-expression vs. Harmony	.81	.67	.67	.75

Note. The item selection sample includes 120 participants (65 Chinese and 55 British) of control condition (including psychology students); Main sample includes 296 participants (178 Chinese and 118 British) of all the five conditions (excluding psychology students).