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## When message-frame fits salient cultural-frame, messages feel more persuasive

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The present study examines the persuasive effects of tailored health messages comparing those tailored to match (*versus* not match) both chronic cultural frame and momentarily salient cultural frame. Evidence from two studies (Study 1:  $n = 72$  European Americans; Study 2:  $n = 48$  Asian Americans) supports the hypothesis that message persuasiveness increases when chronic cultural frame, health message tailoring and momentarily salient cultural frame all match. The hypothesis was tested using a message about health risks of caffeine consumption among individuals prescreened to be regular caffeine consumers. After being primed for individualism, European Americans who read a health message that focused on the personal self were more likely to accept the message – they found it more persuasive, believed they were more at risk and engaged in more message-congruent behaviour. These effects were also found among Asian Americans who were primed for collectivism and who read a health message that focused on relational obligations. The findings point to the importance of investigating the role of situational cues in persuasive effects of health messages and suggest that matching content to primed frame consistent with the chronic frame may be a way to know what to match messages to.

**Keywords:** culture; individualism-collectivism prime; health communication; match; persuasion

### Introduction

Human judgement is greatly influenced by the information accessible at the moment of decision making, resulting in profound effects of contextually salient information across a variety of domains (Schwarz, Bless, Wänke, & Winkielman, 2003; Srull & Wyer, 1979; Wyer & Srull, 1989). Critical for health communications researchers, a large body of research underscores the importance of momentary contexts on subjective construal – what information is taken to mean and whether persuasive communication is likely to be accepted (Cesario, Grant, & Higgins, 2004; Schwarz et al., 2003; Schwarz, Sanna, Skornik, & Yoon, 2007; Song & Schwarz, 2008). While culture was not initially implicated in social cognition research, an emerging body of research suggests that what is considered as relevant information is likely to be culture-bound (for a review, see Oyserman, Coon, & Kimmelmeier, 2002) and that momentary cues can increase salience of cultural frames in

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information processing (for a review, see Oyserman & Lee, 2008a). Integrating culture into social cognition research suggests that accessible information is relevant when it is relevant to one's cultural frame and is presented following culturally-relevant themes. Such match of message content to salient cultural themes should increase the metacognitive experience that the presented information is relevant to judgement. Advertisers seem to have an intuitive sense of this – advertisements are more likely to highlight culture-relevant than culture-irrelevant themes (for a meta-analysis on cultural products including advertisements, see Morling & Lamoreaux, 2008).

However, literature to date, summarised below, demonstrates that simply matching the messages to features of individuals does not always increase message persuasiveness. Rather, we propose that the matched feature must also be situationally salient. In the current article, we focus on persuasiveness of health communication that is tailored to match salient cultural frame, testing the hypothesis that a message will be perceived as more persuasive and self-relevant, as well as more accepted and acted on when framed in culture-relevant terms and culture has been brought to mind in context. We term such situations culture-matches and term situations in which message frame does not match both chronic and situationally salient cultural frame culture-mismatches or non-matches. We operationalised cultural frame as focused on individualism or collectivism and individualism culture-matches as situations in which match with individualism are likely to occur and collectivism culture-matches as situations in which match with collectivism are likely to occur. Individualism culture-matches are proposed to occur when individualism is likely to be *chronically accessible* (e.g. among European Americans), the health message is *framed* in terms relevant to individualism and participants are likely to be *thinking* in terms of individualism because it has just been primed. In parallel, collectivism culture-matches are proposed to occur when collectivism is likely to be *chronically accessible* (e.g. among East-Asian Americans), the health message is *framed* in terms relevant to collectivism and participants are likely to be *thinking* in terms of collectivism because it has just been primed. Mismatch or non-match would occur when prime and frame do not match chronic cultural frame.

As outlined in the following text, our hypotheses are culturally grounded and congruent with literatures on fluency and persuasion. In brief, the cultural-frame literature suggests that messages will be more persuasive when framed in culturally-relevant terms, particularly when chronic cultural frame has been made salient and therefore is an accessible processing framework (for a review, see Oyserman & Lee, 2008a). The fluency literature (for reviews see Schwarz, 2004; Winkielman, Schwarz, Fazendeiro, & Reber, 2003) suggests that message persuasiveness is enhanced when processing the information feels fluent. Anything that increases processing ease influences judgements about the informational value of a statement (for examples of the robustness of this effect see, Schwarz et al., 2007; Song & Schwarz, 2008; Weaver, Garcia, Schwarz, & Miller, 2007). Processing ease has also been described as 'feeling right' and messages that feel right are more likely to be persuasive (Cesario et al., 2004). Note that these effects are independent of the quality of the message (Schwarz et al., 2007; Song & Schwarz, 2008).

Thus, while prior research within the persuasion literature has examined effects of matching message to individual, this research has not benefited from a social cognition perspective and so has failed to consider the importance of making the relevant information cues salient at the moment of decision-making. Instead, the persuasion literature has focused on increasing the impact of persuasive appeals by matching the content and procedural cues embedded in the message with relevant target characteristics, which may or may not be salient at the moment of judgement (for review see Kreuter,

Strecher, & Glassman, 1999). Positive effects of match between message-frame and individual characteristics have been found for content- and process-related characteristics. Content-related characteristics include one's attitudes, thoughts and feelings (Fabrigar & Petty, 1999), for example cultural values or attributes (e.g. Han & Shavitt, 1994; Kreuter, Lukwago, Bucholtz, Clark, & Sanders-Thompson, 2002; Kreuter, & McClure, 2004; Resnicow, Baranowski, Ahluwalia, & Braithwaite, 1999). Process-related characteristics include one's preferred style of processing information, including decision-making style (Orbell, Perugini, & Rakow, 2004), motivational style (Mann, Sherman, & Updegraff, 2004), preference for *ideal* or *ought* self-guides (e.g. Evans & Petty, 2003), *promotion* or *prevention* self-regulatory focus (Cesario et al., 2004; Shah, Higgins, & Friedman, 1998), or *public* or *private* self-monitoring style (Snyder & DeBono, 1985; Williams-Piehota, Pizarro, Schneider, Mowad, & Salovey, 2003). Match in these studies is between message-frame and individual or cultural characteristics. For example, in two studies, participants of East-Asian background found prevention focused messages more persuasive and participants of European or American background found promotion focused messages more persuasive (Aaker & Lee, 2001; Uskul, Sherman, & Fitzgibbon, in press). In both studies, results were interpreted to mean that match or fit between message frame and frame associated with chronic cultural style matter, with promotion frame fitting with cultural individualism and a prevention frame fitting with cultural collectivism.

### ***Individualism and collectivism and persuasiveness of health messages***

Individualistic cultural frames emphasise the individual, personal autonomy and self-fulfilment (Hofstede, 1980; Kagitcibasi, 1994; Oyserman et al., 2002a; Schwartz, 1990; Triandis, 1995). Collectivistic cultural frame emphasises the social, mutual obligations and fulfilment of in-group expectations (Hofstede, 1980; Kagitcibasi, 1994; Oyserman et al., 2002a; Schwartz, 1990; Triandis, 1995). Societies differ not in whether individuals can use an individualistic or collectivistic frame, but in the likelihood that each frame is cued across contexts in everyday life (Oyserman, Kimmelmeier, & Coon, 2002b).

Several studies have demonstrated increased persuasiveness of advertisements linked with chronic cultural focus. For example, among Korean and Chinese viewers, when advertisements emphasise social norms and roles (e.g. family well-being, in-group goals) they are more persuasive than advertisements that emphasise individual preferences and benefits (e.g. self-improvement, personal rewards) (Han & Shavitt, 1994; Zhang & Gelb, 1996). Presumably these results are grounded in higher chronic salience of collectivism in these countries.

Our current focus is on health messages. Though cultural variation in how health is understood has been little studied, as we outline below, individualism may cue focus on the physical body and wellness whereas collectivism may cue focus on illness as a to-be-avoided breakdown in one's ability to carry out obligations. In this sense, having a capable and healthy body is a goal within an individualistic frame. Within a collective frame fitting into the social order is the goal, having a healthy body is a means to this goal.

With regard to individualism, the link to health seems to have been a part of the implicit operationalisation of the term, as can be seen by the fact that the statement 'I value being in good health above everything' is an item in Singelis's (1994) independent self-construal factor. This item does indeed load on the independent self-construal factor empirically (Singelis, 1994). Within literature focused explicitly on American

individualism, this linkage is also apparent; sociologists Rose (1996) and Lock (1999) link American cultural focus on wellness, avoidance of illness and improvement of health with American cultural focus on self-actualisation and personal responsibility. Psychologists Crawford (1984) and Baumeister (1997), link American's desire to maintain their health with their desire to be autonomous individuals.

In contrast, collectivism is associated with an interpretation of ill-health in terms of social responsibility and desire to avoid failure to properly fulfil social obligations (Uskul & Hynie, 2007, 2008). In a study involving recall of a time when one was ill, participants who rated themselves as more relational and collective were more concerned with the social consequences of health problems such as being a burden to and unable to fulfil responsibilities towards loved ones (Uskul & Hynie, 2007). Congruent with this finding, in a follow-up study (Uskul & Hynie, 2008) participants who rated themselves as more relational and collective were more likely to report social engaged emotions (shame and embarrassment) about their illness rather than socially disengaged emotions (anger and frustration) (Kitayama, Mesquita, & Karasawa, 2006).

Thus, the available literature suggests that individualistic and collectivistic cultural perspectives yield differing salient frameworks for understanding health and illness. Following from this, messages that attempt to influence health and health risk behaviours that are congruent with cultural frame are more likely to feel relevant and therefore more likely to influence judgement about appropriate behaviour. Our literature search yielded a number of studies that tested the persuasive effects of matching health message content to cultural characteristics. However, these studies did not make culture frame salient in context, which may explain the generally weak results. Studies found effects in some conditions, not others and across studies, which cultural frame was more potent also shifted as can be seen below.

In a study involving Canadian college student participants, effects were found for collectivism-match but not for individualism-match (Uskul, 2004). In this study, independent (individualistic) and interdependent (collectivistic) ways of defining the self were rated. The collectivism-match result was that collectivistic participants rated a relevant health message as more convincing when it emphasised negative consequences for significant others of one's own engagement in the risky health behaviour. No individualism-match was found, individualistic participants did not rate a relevant health message as more convincing when it emphasised negative consequences for one's own physical health.

In a second study involving youth participants who were either Mexican immigrant or African American, some effects were found for collectivism-match and for individualism-match on some outcome measures (Murray-Johnson, Witte, Liu, & Hubbell, 2001). In this study, individualistic and collectivistic ways of defining the self were also rated. The collectivism-match results were that the Mexican immigrant youth generally and collectivistic participants specifically found an AIDS message more frightening when it focused on family-related consequences of AIDS. The individualism-match results were that the African American youth generally and individualistic participants specifically found the AIDS message more frightening when it focused on self-related consequences of AIDS. Match results were found only for self-rated fear evoked by the message; no effects were observed for attitudes towards AIDS prevention or for intentions to prevent the risk of HIV infection.

Another series of studies focused on African American adults. These studies report on perceived favourability rather than persuasiveness of message content. While Murray-Johnson et al. (2001) found some evidence that individualistically framed

messages had more impact for African American youth, studies with African American adults show the opposite direction of effect. In these studies, messages incorporating interdependent content were rated more favourably (Herek et al., 1998; Kalichman & Coley, 1995; Kreuter et al., 2004).

### *Current studies*

We addressed the gap in the literature created by lack of application of a culturally informed social cognition framework (e.g. Oyserman & Lee, 2008a; Oyserman & Sorensen, 2009; Oyserman, Sorensen, Reber, Chen & Sannum, in press) to the health communication field. By making cultural frame salient, we expected that we would be able to demonstrate consistent effects for both individualism-congruent and collectivism-congruent judgement tasks. As summarised above, the health communication literature cannot directly address this issue because in prior studies cultural frame was not necessarily salient at the time of judgement. That is, while this literature recognises the positive persuasive impact of matching message to characteristics of the intended message recipient, including cultural characteristics such as individualism and collectivism, research to date has focused on matching message frame to chronic cultural frame and has not primed relevant cultural frame. Therefore, in the current studies we tested the persuasiveness of health messages framed to match or mismatch chronic cultural frame among individuals primed with chronic or less accessible cultural frame. We hypothesised that messages would be more persuasive when chronic cultural frame had been primed and message frame fit this chronic cultural frame. We tested this hypothesis in a group assumed chronically higher in individualism (European Americans, Study 1) and in a group assumed to be chronically higher in collectivism (Asians and Asian Americans, Study 2).

### **Study 1**

#### *Method*

##### *Participants and design*

We used a 2 (cultural frame) by 2 (message frame) between-subjects design. The persuasive health message focused on negative effects of caffeine consumption. Therefore, we prescreened for subject-pool participants who were European American, female, and reported drinking two or more cups of caffeinated drinks daily (procedure followed Liberman & Chaiken, 1992). A few weeks after prescreening, we invited 75 participants who met screening criteria to participate in a 30-min study on 'how people process scientific information'. Data from three participants could not be used (two were suspicious about the health article, and one did not complete the prime), resulting in a final sample of  $n = 72$  ( $M_{\text{age}} = 18.56$ ,  $SD = 0.81$ ).

##### *Procedure and measures*

Participants arrived at the lab in small groups of two to four participants, instructions were provided by a European American female experimenter blind to study hypotheses. Participants were randomly assigned to cultural frame prime (individualism or collectivism), primed, randomly assigned to message frame (individual or relational consequences of caffeine consumption), then given a 'Health Today Newsletter' article



to read. The article described fibrocystic disease (FD) and its consequences, citing research linking it to caffeine consumption. The individual consequences and relational consequences articles were of equal length. We used boxed text and bold font to attract attention to relevant content (consequences of caffeine consumption for the individual or for relationships). After participants finished reading the article, the research assistant collected it and provided the questionnaire which contained, in order, the dependent measures, manipulation checks and demographic questions. After the questionnaire was completed, participants passed by a sign that read 'Free Candies for Study Participants' above three boxes of candy. Each box was identical in size, wrapping and brand except that one box was labelled fruit candies, one labelled coffee candies and one labelled chocolate candies. Candies taken were unobtrusively counted by the research assistant. Prior to leaving, participants were debriefed.

*Priming chronic cultural-frame.* The pronoun circling task (Gardner, Gabriel, & Lee, 1999) was used to prime individualism or collectivism. Nineteen first person singular – *I, me, mine* or *me* (individualism prime) or first person plural – *we, our, us* (collectivism prime) pronouns were embedded in the paragraph. All participants circled at least 13 pronouns.

*Message frame.* Individual consequences of FD included feelings of tenderness and lumps in breasts, following Liberman and Chaiken's (1992) and Sherman, Nelson, and Steele's (2000) high-threat article (which were in turn based on Kunda (1987)). Relational consequences of FD included not being able to take proper care of one's family, not being able to properly fulfil one's social roles and responsibilities, following Uskul and Hynie (2007). We ascertained that messages were rated as equally threatening,  $F(1, 68) = 2.61, p = 0.11$ .

*Dependent measures.* We assessed message acceptance, perceived risk, personal relevance and behaviour. Message acceptance was assessed with two items: (1) *To what extent do you agree or disagree that there is an association between caffeine and FD?* (1 = completely disagree, 9 = completely agree), (2) *How important do you think it is that women reduce their caffeine intake in order to avoid FD?* (1 = not important at all, 9 = extremely important) which were averaged to form an index of message acceptance ( $\alpha = 0.80$ ). Perceived risk was assessed by asking *To what extent do you perceive yourself to be at risk of developing FD?* (1 = not at risk at all, 9 = extremely at risk). Personal relevance was assessed by asking *How personally relevant was the topic of the article to you?* (1 = not relevant at all, 9 = extremely relevant). The behavioural measure of message acceptance was the number of non-caffeinated (fruit) candies chosen, covarying on the number of caffeinated (coffee and chocolate) candies chosen.

*Manipulation check.* Participants were asked *'To what extent do you think that this message was reporting on the physical consequences of caffeine consumption and developing FD?'* and *'To what extent do you think that this message was reporting on the interpersonal/social physical consequences of caffeine consumption and developing FD?'* (1 = not at all, 9 = completely). Effects were as expected. Article focus influenced judged focus; participants who read the self-focused article rated it as more physical ( $M = 6.50, SD = 1.58$ ) than relational ( $M = 2.72, SD = 1.34$ ) in focus,  $F(1, 35) = 115.11, p < 0.001$ , participants who read the relational-focused article rated it as more relational ( $M = 6.11,$

SD = 1.33) than physical ( $M = 4.44$ ,  $SD = 1.68$ ) in focus,  $F(1, 35) = 15.63$ ,  $p < 0.001$ . Participants who read the self-focused article rated it as more physical than did participants who read the relational-focused article  $F(1, 70) = 28.40$ ,  $p < 0.001$ , those who read the relational-focused article rated it as more relational than did participants who read the self-focused article,  $F(1, 70) = 115.97$ ,  $p < 0.001$ .

### **Results and discussion**

We expected that health messages that fit chronic and primed cultural frame would be more persuasive. That is what we found using both a summative multivariate analysis of variance (MANOVA with Wilks' Lambda) and a set of univariate analyses (ANOVA). Each analysis revealed the expected prime by message frame interaction. First, the overall interaction was significant, MANOVA  $F(5, 63) = 6.04$ ,  $p < 0.001$ , and second, the ANOVAs demonstrated that for each outcome variable, the expected primed cultural frame by message content interaction was significant – as can be seen in Table 1 which displays means, main and interaction effects and in Figure 1 which displays planned contrasts.

We interpret these results to mean that when health messages fit chronic and primed cultural frame, they are more persuasive. Study 1 demonstrates these effects with people assumed to be individualistic in chronic cultural frame. A limitation is that we cannot tell if the result we found – improved persuasiveness by matching with individualism, is due to match of primed individualism with message frame among chronic individualists as we posited or if the relational content and the collectivism cultural prime were simply less effective. To rule out this latter possibility, in Study 2 we utilised an Asian and Asian American sample, replicating the procedures used in Study 1. In Study 2 we again hypothesised that match improves persuasiveness. Because the Study 2 sample involves individuals assumed to be collectivistic in chronic cultural frame, in Study 2, the expected effective match was improved persuasiveness by matching with salient collectivism.

## **Study 2**

### **Method**

#### *Participants and design*

We used the same design and prescreening procedure described in Study 1, recruiting 48 East Asian women who reported consuming two or more cups of caffeinated drinks daily and ( $M_{\text{age}} = 20.12$ ,  $SD = 2.28$ , 23 Chinese American, 17 Korean American, 4 Taiwanese American, 1 Vietnamese American, 3 Asian). Procedure and measures were identical to Study 1 (message acceptance  $\alpha = 0.76$ ), experimenter ethnicity matched participant-ethnicity as before. No participant voiced suspicion about the procedure and all participants circled all 19 pronouns in the cultural-frame priming task. Manipulation check confirmed the expected effects whether assessed within or between subjects. Participants who read the self-focused article rated it as more physical ( $M = 6.52$ ,  $SD = 2.10$ ) than relational ( $M = 3.80$ ,  $SD = 2.24$ ,  $F(1, 24) = 20.84$ ,  $p < 0.001$ ); participants who read the relational-focused article rated it as more relational ( $M = 5.43$ ,  $SD = 1.90$ ) than physical ( $M = 4.57$ ,  $SD = 1.50$ ,  $F(1, 22) = 3.28$ ,  $p = 0.08$ ). The self-focused article was rated more physical than the relational-focused article  $F(1, 46) = 13.51$ ,  $p = 0.001$ ;



Table 1. Study 1 (European Americans) means (SDs) and MANOVA results for dependent measures.<sup>a</sup>

Dependent variable	Message content	Culture-prime				MANOVA <i>df</i> (1, 67)		<i>df</i> (1, 67)
		Independence		Interdependence		Main effect of prime	Main effect of message content	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Message acceptance	Self-focused	6.72	(1.89)	5.37	(1.84)	$F = 2.80, p = 0.099$	$F = 0.61, p = 0.44$	$F = 6.20, p < 0.02$
	Relational-focused	5.00	(1.58)	5.71	(1.68)			
Perceived risk	Self-focused	6.06	(1.43)	4.37	(1.71)	$F = 4.79, p = 0.03$	$F = 3.81, p = 0.055$	$F = 6.03, p < 0.02$
	Relational-focused	4.28	(1.56)	4.47	(1.77)			
Perceived relevance	Self-focused	7.06	(1.63)	4.32	(1.77)	$F = 2.08, p = 0.15$	$F = 13.71, p < 0.001$	$F = 12.76, p < 0.01$
	Relational-focused	5.17	(1.20)	5.12	(1.73)			
Number of fruit candies chosen	Self-focused	0.89	(0.68)	0.06	(0.24)	$F = 14.86, p < 0.001$	$F = 13.32, p = 0.01$	$F = 15.93, p < 0.001$
	Relational-focused	0.11	(0.32)	0.12	(0.33)			

Note: Sample size per condition varied between  $n = 17$  and  $n = 18$ .

<sup>a</sup>Priming individualism (IND) rather than collectivism (COL) increased message acceptance ( $M_{IND} = 5.86, SD = 1.74, M_{COL} = 5.54, SD = 1.76, F(1, 67) = 2.80, p < 0.10$ ), perceived risk ( $M_{IND} = 5.17, SD = 1.50, M_{COL} = 4.42, SD = 1.74, F(1, 67) = 4.79, p = 0.03$ ), and behavioural engagement ( $M_{IND} = 0.5, SD = 0.5, M_{COL} = 0.09, SD = 0.29, F(1, 67) = 14.86, p < 0.001$ ). Self-focused (S) rather than relational-focused (R) message-frame increased perceived risk ( $M_S = 5.22, SD = 1.57, M_R = 4.38, SD = 1.67, F(1, 67) = 3.81, p = 0.055$ ), relevance ( $M_S = 5.69, SD = 1.70, M_R = 5.15, SD = 1.47, F(1, 67) = 13.71, p < 0.001$ ), and behavioural engagement ( $M_S = 0.48, SD = 0.46, M_R = 0.12, SD = 0.33, F(1, 67) = 13.32, p = 0.01$ ).

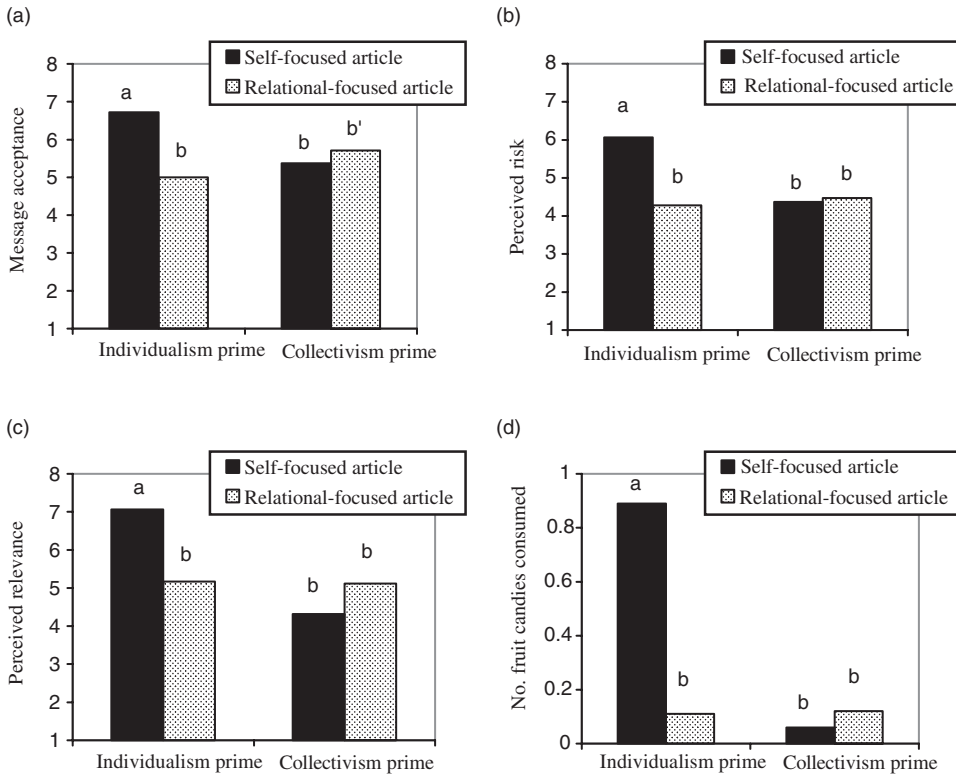


Figure 1. Study 1 (European Americans): Impact of prime and message content. (a) Message acceptance, (b) Perceived risk, (c) Perceived relevance, (d) Number of fruit candies consumed.

Note: In each panel, different superscripts denote contrasts significant at  $p < 0.001$  and  $p < 0.05$ , except in Panel I where b and b' superscripts do not differ and the contrast between superscripts a and b' is at trend,  $p = 0.16$ .

the relational-focused article was rated more relational than the self-focused article,  $F(1, 46) = 7.38$ ,  $p = 0.008$ . As before, self- and relational-focused messages were rated as equally threatening,  $F < 1$ .

### Results and discussion

Results support our matching hypotheses. Specifically, the prime by message frame interaction was significant overall, MANOVA ( $F(5, 40) = 8.24$ ,  $p < 0.001$ ) and for each dependent measure as detailed in Table 2. Planned contrasts revealed that message acceptance, perception of risk, article relevance and behavioural engagement were each higher (see Figure 2 for means and contrasts) in the condition in which message content and prime matched assumed chronic cultural frame; that is, among participants primed with collectivism who read a relational-focused message.

### General discussion

Building on social cognition literature, we predicted that matching health messages to salient cultural frames would increase persuasiveness, predicting that culturally relevant messages would be more persuasive if they came after being reminded of one's

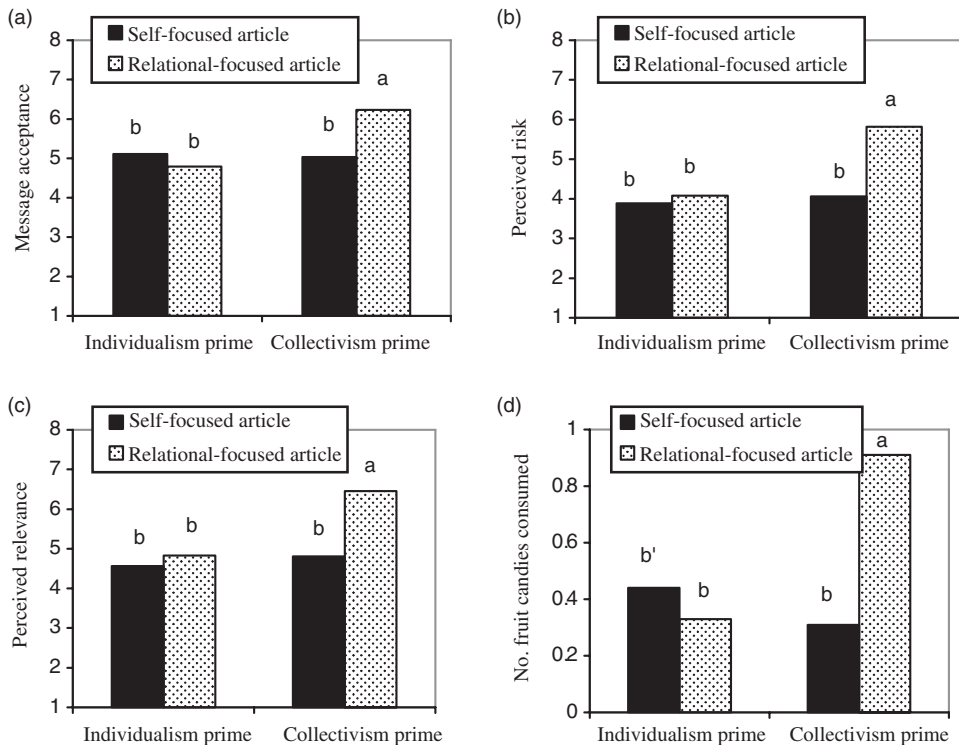


Figure 2. Study 2 (Asian and Asian Americans): Impact of prime and message content. (a) Message acceptance, (b) Perceived risk, (c) Perceived relevance, (d) Number of fruit candies consumed.

Note: In each panel, different superscripts denote contrasts significant at  $p < 0.001$  and  $p < 0.05$ , except in Panel IV where b and b' superscripts do not differ and the contrast between superscripts a and b' is significant at  $p = 0.095$ .

cultural frame. Our results support this hypothesis. Presumed individualists (European Americans) induced to focus on individualism were more persuaded by health messages associating health behaviour with negative physical consequences for the self. Presumed collectivists (Asian Americans) induced to focus on collectivism were more persuaded by health messages associating health behaviour with negative social consequences. Culture-matched messages did not differ in their perceived threat, but did differ in their effectiveness from mis-matched or non-matched messages, suggesting a reason for weak effects in prior research focused on main effects of message framing.

Thus, our results suggest that message effectiveness can be increased by reminding potential listeners of their chronically relevant cultural-orientation by making it momentarily salient. In this way, our results propose a way to handle a conundrum for the health communication field – the need to target messages coupled with lack of knowledge about what intended consumers may be thinking when they come in contact with the health message. As noted by Kreuter, Farrell, Olevitch, and Brennan (1999) and Kreuter and Wray (2003) when health communication is not targeted, individuals are less likely to see it as relevant to them, but when it is targeted to a specific group, it is not clear that individuals happen to be thinking of themselves with reference to this

Table 2. Study 2 (Asian and Asian Americans) means (SDs) and MANOVA results for dependent measures.<sup>a</sup>

Dependent variable	Message content	Prime type				MANOVA		df (1, 42)
		Independence		Interdependence		Main effect of prime	Main effect of message content	
		M	SD	M	SD			
Message acceptance	Self-focused	5.11	(1.05)	5.03	(0.94)	$F = 6.28, p < 0.02$	$F = 2.21, p = 0.11$	$F = 6.60, p < 0.01$
	Relational-focused	4.79	(0.81)	6.23	(0.88)			
Perceived risk	Self-focused	3.89	(0.60)	4.06	(0.85)	$F = 17.47, p < 0.001$	$F = 18.24, p < 0.001$	$F = 11.69, p < 0.01$
	Relational-focused	4.08	(0.79)	5.82	(0.75)			
Perceived relevance	Self-focused	4.56	(0.73)	4.81	(0.91)	$F = 13.50, p < 0.01$	$F = 14.11, p < 0.01$	$F = 7.12, p = 0.01$
	Relational-focused	4.83	(0.58)	6.45	(1.13)			
Number of fruit candies chosen	Self-focused	0.44	(0.53)	0.31	(0.48)	$F = 1.15, p = 0.29$	$F = 2.36, p = 0.13$	$F = 5.57, p = 0.02$
	Relational-focused	0.33	(0.49)	0.91	(0.30)			

Note: Sample size per condition ranged between  $n = 9$  and  $n = 16$ .

<sup>a</sup>Priming Collectivism (COL) vs. Individualism (IND) increased message acceptance ( $M_{COL} = 5.63, SD = 0.91, M_{IND} = 4.95, SD = 0.93, F(1, 42) = 6.28, p < 0.02$ ), perceived risk ( $M_{COL} = 4.94, SD = 0.80, M_{IND} = 3.99, SD = 0.70, F(1, 42) = 17.47, p < 0.001$ ), and perceived relevance ( $M_{COL} = 5.63, SD = 1.02, M_{IND} = 4.70, SD = 0.66, F(1, 42) = 13.50, p < 0.01$ ). Relational-focused (R) rather than self-focused (S) message-frame increased message acceptance ( $M_R = 5.11, SD = 0.85, M_S = 5.07, SD = 1.52, F(1, 42) = 2.21, p = 0.11$ ), perceived risk ( $M_R = 4.95, SD = 0.77, M_S = 3.98, SD = 0.73, F(1, 42) = 18.24, p < 0.001$ ), and perceived relevance ( $M_R = 5.64, SD = 0.89, M_S = 4.69, SD = 0.82, F(1, 42) = 14.11, p < 0.01$ ).

group at the time of message processing. Our findings suggest that matching content to primed frame consistent with the chronic frame may be a way to know what to match messages to. Future research is needed to investigate ways in which priming can be employed in real life intervention settings to increase message effectiveness. Some promising methods include embedding primes in the context via features of the situation itself or via apparently irrelevant tasks.

Moreover, our findings contribute to an emerging health literature highlighting the role of culture and identity in how health is managed and maintained (Contrada & Ashmore, 1999; Hardie, Kashima, & Pridmore, 2005; Oyserman, Fryberg, & Yoder, 2007; Uskul & Hynie, 2007, 2008). Our studies also supported the notion that the physical body and consequences for its well-being are perceived as part of the bounded self within an individualistic framework but that health appeals intending to improve health by focusing on the physical body are unlikely to be convincing when the self is socially embedded as within a collectivistic framework. Finally, our studies add to the literature on cultural frame priming. Typically the impact of priming cultural frame is assessed on immediately presented dependent variables (Oyserman & Lee, 2008a, 2008b). In the present studies, we find effects after processing a lengthy and reasonably complex text, 10–15 min after the prime. In addition, whereas cultural frame priming studies typically focus on priming content (e.g. values, content of self-concept) or process (e.g. cuing a contrast and separate or an assimilate and connect cognitive style) (for a review, see Oyserman & Lee, 2008b), in the current studies, we focused on cultural frame as cuing a goal – being healthy for myself or being healthy for my relationships and thereby contribute to the limited literature on the impact of cuing a goal. Our results suggest that cultural frame priming does influence participants' processing of complex and potentially threatening verbal information as relevant to their health goal, but only when the prime is congruent with chronic cultural frame and especially when it is also congruent with the way the message is framed.

More generally, our results suggest that, at least under some circumstances, strong person-situation effects (Shah et al., 1998) can be attained when individual characteristics and situational affordances match. Moreover, incongruent findings in the persuasion literature may be due to participant awareness that messages include identity-relevant content in an effort to influence them. Heavy-handed influence attempts in which participants are aware of the expected influence of the prime consistently result in contrast effects as participants react against the influence attempt (Lombardi, Higgins, & Bargh, 1987; Srull & Wyer, 1979).

A number of limitations of our studies should be noted. First, our studies focused on the impact of a (fabricated) link between caffeine consumption and physical and relational well-being. Future research is needed to replicate the results with health behaviours having varying degrees of severity. Second, given the disease description, we focused on women; further studies should demonstrate effects for both genders. Last, we proposed but did not measure the underlying process and future research should do so.

We argued that the underlying process had to do with fluency – the match felt right, the priming resulted in making the message feel like it fit (for reviews, see Cesario & Higgins, 2008; Cesario et al., 2004; Schwarz, 2004; Winkielman et al., 2003). The fit literature has focused explicitly on matches between processing style and context, while the ease literature has focused more generally on factors that increases processing ease – fit being one of them. However, both formulations converge in predicting that factors that influence ease (and fit) should also influence judgements about the informational

value of a statement. Simply put, things that are easy to process are more likely to be judged as true (e.g. Reber & Schwarz, 1999; Weaver et al., 2007). This effect is independent of the quality of the information presented – for example, in the studies by Reber and Schwarz (1999), information was judged as true when presented in easy to read print font, in the studies by Song and Schwarz (2008), information was judged as true when presented in easier to say rhymes, or in easier to read print fonts, in the studies by Weaver et al. (2007), information was judged more persuasive when simply repeated. We interpret our results within this body of work, suggesting that culture-match makes messages more persuasive because they are easier to process. Ease and fit are likely to be non-conscious processes, like other primes, so that drawing attention to them should undo the effect (e.g. Lombardi et al., 1987). However, we did not assess ease directly and future research could attempt to assess ease (e.g. Reber & Schwarz, 1999) or fit perhaps by using thought-listing (e.g. Chaiken & Maheswaran, 1994; Chen, Schechter, & Chaiken, 1996) or evaluation of memory errors (e.g. Fiedler, Walther, Armbruster, Fay, & Naumann, 1996).

Taken together, we believe that a fluency model is the most likely process explanation for our findings. Two other models that might seem relevant to our model – depth of processing (Boninger, Krosnick, Berent, & Fabrigar, 1995) and self-affirmation (Steele, 1988), do not make clear *a priori* predictions, though they provide potentially relevant *post hoc* explanations. Depth of processing models propose that influence attempts work better when poor quality arguments are processed peripherally, when good quality arguments are processed deeply and when counter-arguments are not developed. A *post facto* argument could be made that match effects occurred either because non-matching information was peripherally processed and therefore not persuasive or because it was centrally processed through counter-arguing and therefore rejected as non-persuasive. There is some evidence that unmatched information is less deeply processed (Aaker & Lee, 2001; Updegraff, Sherman, Luyster, & Mann, 2007), but this would not necessarily lead to a prediction that it would be more or less persuasive in this case. Another way to understand persuasive communication is within a self-affirmation (Steele, 1988) framework. Here too no *a priori* prediction could be made about how the process would work. Prior research showed reduced defensive responding to health messages when valued self-images were affirmed (Harris, Mayle, Mabbott, & Napper, 2007; Harris & Napper, 2005; Sherman et al., 2000). In our case, the prime may remind participants of culturally relevant and valued characteristics such as independence or interdependence and this may be self-affirming, but this does not explain why participants would be more willing to change only when the message itself was framed in culture-relevant terms as well.

In sum, the current studies can be seen as a first step in demonstrating effectiveness of matching message to cued chronic cultural frame. Findings suggest that activating chronic cultural frame and presenting health information within this framework increases persuasiveness of health messages that might otherwise be threatening. Given the complexity of persuasion, these results suggest a useful tool.

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## References

- Aaker, J., & Lee, A. (2001). 'I' seek pleasures and 'we' avoid pains: The role of self-regulatory goals in information processing and persuasion. *Journal of Consumer Research*, 28, 33–49.
- Baumeister, R.F. (1997). The self and society: Changes, problems, and opportunities. In R.D. Ashmore, & L. Jussim (Eds.), *Self and identity: Fundamental issues* (Vol. 1, pp. 191–217). New York: Oxford.
- Boninger, D., Krosnick, J., Berent, M., & Fabrigar, L. (1995). The causes and consequences of attitude importance. In R. Petty, & J. Krosnick (Eds.), *Attitude strength: Antecedents and consequences* (pp. 159–189). Hillsdale, NJ: Erlbaum.
- Chaiken, S., & Maheswaran, D. (1994). Heuristic processing can bias systematic information processing: Effects of source credibility, argument ambiguity and task importance on attitude judgment. *Journal of Personality and Social Psychology*, 66, 460–473.
- Chen, S., Schechter, D., & Chaiken, S. (1996). Getting at the truth or getting along: Accuracy- versus impression-motivated heuristic and systematic processing. *Journal of Personality and Social Psychology*, 71, 262–75.
- Contrada, R.J., & Ashmore, R.D. (1999). *Self, social identity and health*. London: Oxford.
- Cesario, J., & Higgins, E.T. (2008). Making message recipients 'Feel Right': How nonverbal cues can increase persuasion. *Psychological Science*, 19, 415–420.
- Cesario, J., Grant, H., & Higgins, T.E. (2004). Regulatory fit and persuasion: Transfer from 'Feeling right'. *Journal of Personality and Social Psychology*, 86, 388–404.
- Crawford, R. (1984). A cultural account of health: Self-control, release, and the social body. In J. McKinlay (Ed.), *Issues in the political economy of health care* (pp. 60–103). London: Tavistock.
- Evans, L., & Petty, R. (2003). Self-guide framing and persuasion: Responsibly increasing message processing to ideal levels. *Personality and Social Psychology Bulletin*, 29, 313–324.
- Fabrigar, L.R., & Petty, R.E. (1999). The role of the affective and cognitive bases of attitudes in susceptibility to affectively and cognitively based persuasion. *Personality and Social Psychology Bulletin*, 25, 363–381.
- Fiedler, K., Walther, E., Armbruster, T., Fay, D., & Naumann, U. (1996). Do you really know what you have seen? Intrusion errors and presuppositions effects on constructive memory. *Journal of Experimental Social Psychology*, 32, 484–511.
- Gardner, W., Gabriel, S., & Lee, A. (1999). 'I' value freedom but 'we' value relationships: Self construal priming mirrors cultural differences in judgment. *Psychological Science*, 10, 321–326.
- Han, S., & Shavitt, S. (1994). Persuasion and culture: Advertising appeals in individualistic and collectivistic societies. *Journal of Experimental Social Psychology*, 30, 326–350.
- Hardie, E.A., Kashima, E.S., & Pridmore, P. (2005). The influence of relational, individual and collective self-aspects on stress, uplifts and health. *Self and Identity*, 4, 1–24.
- Harris, P., Mayle, K., Mabbott, L., & Napper, L. (2007). Self-affirmation reduces smokers' defensiveness to graphic on-pack cigarette warning labels. *Health Psychology*, 26, 437–446.
- Harris, P.R., & Napper, L. (2005). Self-affirmation and the biased processing of threatening health-risk information. *Personality and Social Psychology Bulletin*, 31, 1250–1263.
- Herek, G., Gillis, J., Glunt, E., Lewis, J., Welton, D., & Capitano, J. (1998). Culturally sensitive AIDS education videos for African American audiences: Effects of source, message, receiver, and context. *American Journal of Community Psychology*, 26, 705–743.
- Hofstede, G. (1980). *Culture's consequences*. Beverly Hills, CA: Sage.
- Kalichman, S.C., & Coley, B. (1995). Context framing to enhance HIV-antibody-testing messages targeted to African American women. *Health Psychology*, 14, 247–254.

- Kagitcibasi, C. (1994). A critical appraisal of individualism and collectivism: Toward a new formulation. In U. Kim, H.C. Triandis, C. Kagitcibasi, S.-C. Choi, & G. Yoon (Eds.), *Individualism and collectivism: Theory, method, and applications* (pp. 52–65). Thousand Oaks, CA: Sage.
- Kitayama, S., Mesquita, B., & Karasawa, M. (2006). Cultural affordances and emotional experience: Socially engaging and disengaging emotions in Japan and the United States. *Journal of Personality and Social Psychology, 91*, 890–903.
- Kreuter, M., Farrell, D., Olevitch, L., & Brennan, L. (1999). *Tailored health messages: Customizing communication with computer technology*. Mahwah, NJ: Erlbaum.
- Kreuter, M., Lukwago, S., Bucholtz, D., Clark, E., & Sanders-Thompson, V. (2002). Achieving cultural appropriateness in health promotion programs: Targeted and tailored approaches. *Health Education and Behavior, 30*, 133–146.
- Kreuter, M.W., & McClure, S.M. (2004). The role of culture in health communication. *Annual Review of Public Health, 25*, 439–455.
- Kreuter, M.W., Strecher, V.J., & Glassman, B. (1999). One size does not fit all: The case for tailoring print materials. *Annals of Behavioral Medicine, 21*, 276–283.
- Kreuter, M., & Wray, R. (2003). Tailored and targeted health communication: Strategies for enhancing information relevance. *American Journal of Health Behavior, 27*, S206–S216.
- Kreuter, M., Skinner, C., Steger-May, K., Holt, C., Bucholtz, D., Clark, E., et al. (2004). Response to behaviorally vs. culturally tailored cancer communication among African American women. *American Journal of Health Behavior, 28*, 195–207.
- Kunda, Z. (1987). Motivated inference: Self-serving generation and evaluation of causal theories. *Journal of Personality and Social Psychology, 53*, 636–647.
- Liberman, A., & Chaiken, S. (1992). Defensive processing of personally relevant health messages. *Personality and Social Psychology Bulletin, 18*, 669–679.
- Lock, M. (1999). The politics of health, identity, and culture. In R. Contrada, & R. Ashmore (Eds.), *Self, social identity, and physical health*. New York: Oxford.
- Lombardi, W., Higgins, E.T., & Bargh, J. (1987). The role of consciousness in priming effects on categorisation: Assimilation versus contrast as a function of awareness of the priming task. *Personality and Social Psychology Bulletin, 13*, 411–429.
- Mann, T., Sherman, D., & Updegraff, J. (2004). Dispositional motivations and message framing: A test of the congruency hypothesis in college students. *Health Psychology, 23*, 330–334.
- Morling, B., & Lamoreaux, M. (2008). Measuring culture outside the head: A meta-analysis of individualism-collectivism in cultural products. *Personality and Social Psychology Review, 12*, 199–221.
- Murray-Johnson, L., Witte, K., Liu, W., & Hubbell, A. (2001). Addressing cultural orientation in fear appeals: Promoting AIDS-protective behaviors among Hispanic immigrants and African-American adolescents, and American and Taiwanese college students. *Journal of Health Communication, 6*, 335–358.
- Orbell, S., Perugini, M., & Rakow, T. (2004). Individual differences in sensitivity to health communications: Consideration of future consequences. *Health Psychology, 23*, 388–396.
- Oyserman, D., Coon, H., & Kimmelmeier, M. (2002a). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin, 128*, 3–73.
- Oyserman, D., Fryberg, S., & Yoder, N. (2007). Identity-based motivation and health. *Journal of Personality and Social Psychology, 93*, 1011–1027.
- Oyserman, D., Kimmelmeier, M., & Coon, H.M. (2002b). Cultural psychology, a new look: Reply to Bond (2002), Fiske (2002), Kitayama (2002), and Miller (2002). *Psychological Bulletin, 128*, 110–117.
- Oyserman, D., & Lee, S.W.S. (2008a). Does culture influence what and how we think? Effects of priming individualism and collectivism. *Psychological Bulletin, 134*, 311–342.

- Oyserman, D., & Lee, S.W.S. (2008b). A situated cognition perspective on culture: Effects of priming cultural syndromes on cognition and motivation. In R. Sorrentino, & S. Yamaguchi (Eds.), *Handbook of motivation and cognition across cultures* (pp. 237–265). New York: Elsevier.
- Oyserman, D. & Sorensen, N. (2009). Understanding cultural syndrome effects on what and how we think: A situated cognition model. In C. Chiu, R. Wyer Jr, and Y. Hong (Eds), *Understanding culture: Theory, research and application* (pp. 25–52). New York: Psychology Press.
- Oyserman, D., Sorensen, N., Reber, R., Chen, S.X., & Sannum, P. (in press). Connecting and separating: A situated cognition model to understand effects of priming individualism and collectivism. *Journal of Personality and Social Psychology*.
- Reber, R., & Schwarz, N. (1999). Effects of perceptual fluency on judgments of truth. *Consciousness and Cognition*, 8, 338–342.
- Resnicow, K., Baranowski, T., Ahluwalia, J., & Braithwaite, R. (1999). Cultural sensitivity in public health: Defined and demystified. *Ethnicity and Disease*, 9, 10–21.
- Rose, N. (1996). Identity, genealogy, history. In S. Hall, & P. duGay (Eds.), *Questions of cultural identity* (pp. 128–150). London: Sage.
- Schwarz, N. (2004). Metacognitive experiences in consumer judgment and decision making. *Journal of Consumer Psychology*, 14, 332–348.
- Schwarz, N., Bless, H., Wänke, M., & Winkielman, P. (2003). Accessibility revisited. In G. Bodenhausen, & A. Lambert (Eds.), *Foundations of social cognition: A Festschrift in honor of Robert S. Wyer*. Mahwah, NJ: Erlbaum.
- Schwarz, N., Sanna, L.J., Skurnik, I., & Yoon, C. (2007). Metacognitive experiences and the intricacies of setting people straight: Implications for debiasing and public information campaigns. *Advances in Experimental Social Psychology*, 39, 127–161.
- Schwartz, S. (1990). Individualism–collectivism: Critique and proposed refinements. *Journal of Cross-Cultural Psychology*, 21, 139–157.
- Shah, J., Higgins, E.T., & Friedman, R. (1998). Performance incentives and means: How regulatory focus influences goal attainment. *Journal of Personality and Social Psychology*, 74, 285–293.
- Sherman, D.A., Nelson, L., & Steele, C. (2000). Do messages about health risks threaten the self? Increasing the acceptance of threatening health messages via self-affirmation. *Personality and Social Psychology Bulletin*, 26, 1046–1058.
- Singelis, T. (1994). The measurement of independent and interdependent self-construals. *Personality and Social Psychology Bulletin*, 20, 580–591.
- Snyder, M., & DeBono, K. (1985). Appeals to image and claims about quality: Understanding the psychology of advertising. *Journal of Personality and Social Psychology*, 49, 586–597.
- Song, H., & Schwarz, N. (2008). If it's hard to read, it's hard to do: Processing Fluency affects effort prediction and motivation. *Psychological Science*, 19, 986–988.
- Srull, T., & Wyer, R. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology*, 37, 1660–1672.
- Steele, C.M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 21, pp. 261–302). New York: Academic Press.
- Triandis, H.C. (1995). *Individualism and collectivism*. Boulder, CO: Westview Press.
- Updegraff, J.A., Sherman, D.K., Luyster, F.S., & Mann, T.L. (2007). Understanding how tailored communications work: The effects of message quality and congruency on perceptions of health messages. *Journal of Experimental Social Psychology*, 43, 248–256.
- Uskul, A.K. (2004). *The role of self-construal in illness-related cognitions, emotions, and behavior*. Unpublished Dissertation, York University, Toronto.
- Uskul, A.K., & Hynie, M. (2007). Self-construal and concerns elicited by imagined and real health problems. *Journal of Applied Social Psychology*, 37, 2156–2189.
- Uskul, A.K., & Hynie, M. (2008). *Role of self-construal in emotions elicited by physical health problems*. Manuscript submitted for publication.

- Uskul, A.K., Sherman, D., & Fitzgibbon, J. (in press). The cultural congruency effect: Culture, regulatory focus, and the effectiveness of gain- vs. loss-framed health messages. *Journal of Experimental Social Psychology*.
- Weaver, K., Garcia, S., Schwarz, N., & Miller, D. (2007). Inferring the popularity of an opinion from its familiarity: A repetitive voice can sound like a crowd. *Journal of Personality and Social Psychology*, *92*, 821–833.
- Williams-Piehot, P., Schneider, T.R., Pizarro, J., Mowad, L., & Salovey, P. (2003). Matching health messages to information-processing styles: Need for cognition and mammography utilization. *Health Communication*, *15*, 375–392.
- Winkielman, P., Schwarz, N., Fazendeiro, T., & Reber, R. (2003). The hedonic marking of processing fluency: Implications for evaluative judgment. In J. Musch, & K.C. Klauer (Eds.), *The psychology of evaluation: Affective processes in cognition and emotion* (pp. 189–217). Mahwah, NJ: Erlbaum.
- Wyer, R., & Srull, T. (1989). *Memory and cognition in its social context*. Hillsdale, NJ: Erlbaum.
- Zhang, Y., & Gelb, B.D. (1996). Matching advertising appeals to culture: The influence of products' use conditions. *Journal of Advertising*, *25*, 29–46.