

## Emotion and Appraisal Profiles of the Needs for Competence and Relatedness

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This study examined the emotion and appraisal correlates of the needs for Competence and Relatedness. Using experience-sampling, fluctuations of competence and relatedness throughout a day's period were found to correspond to fluctuations in emotions and appraisals in ways theoretically consistent with the self-determination theory (Deci & Ryan, 2000). Each need was related in specific ways to the six emotions examined (anger, sadness, fear, guilt, shame, and joy) and, more interesting, was characterized by a specific appraisal-profile. Implications of these findings for needs processes are discussed.

According to the self-determination theory (SDT), human needs are important determinants of a wide range of psychological and physical outcomes (Deci & Ryan, 2000). For example, fulfillment of the need to see oneself as competent (competence) and the need for satisfying social relationships (relatedness) are posited to be associated with personal growth and well-being and the deprivation of these needs incurs negative effects. Many studies have supported the predictions of SDT. For instance, daily changes in competence and in relatedness were found to be associated with corresponding daily changes in emotional well-being, vitality, confidence, self-esteem, and other variables (e.g., Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon & Niemiec, 2006; Sheldon, Ryan, & Reis, 1996).

These and other studies underscore the importance of competence and relatedness (Deci & Ryan, 2000) but

several questions still remain. First, because past studies only examined positive and negative global affects (Reis et al., 2000; Sheldon & Niemiec, 2006; Sheldon et al., 1996), little is known about how distinct emotions are related to these needs. This shortcoming can be crucial to the study of needs because different emotions are associated with distinct cognitive processes that cannot be explained just by valence alone (e.g., DeSteno, Petty, Wegener, & Rucker, 2000; Keltner, Ellsworth, & Edwards, 1993; Lerner & Keltner, 2000). Also, specific emotions are known to guide behaviors in ways that go beyond valence (e.g., Frijda, 1986; Tomkins, 1962). In failing to examine whether each need is differentially related to different emotions (e.g., anger, sadness, and fear), researchers risk missing out the finer and more intricate processes that distinct emotions bring to each need. For example, anger is associated with the motivation to remove obstacles and the tendency to attribute negative events to other people, whereas sadness is associated with giving up and the propensity to attribute events to uncontrollable factors (e.g., Frijda, Kuipers, & ter Schure, 1989; Keltner et al., 1993; Smith &

Ellsworth, 1985). Therefore, it makes a difference for the theoretical development of SDT to know whether dissatisfaction of a specific need is associated with anger or sadness because it would indicate how a person derived of that need is likely to respond. Hence, our first objective was to document how competence and relatedness are associated with specific emotions. Five negative emotions (anger, sadness, fear, guilt, and shame) and one positive emotion (joy) were examined. A simple prediction, based on existing research (Reis et al., 2000; Sheldon et al., 1996), is that competence and relatedness should be negatively associated with all five negative emotions and positively associated with joy. However, this study explored the possibility that each need might instead be differentially related to different emotions.

More important, we also examined whether each need is associated with a distinctive pattern of cognitive appraisals. According to appraisal theories, humans evaluate events according to a set of cognitive dimensions such as pleasantness, agency, and control. Appraisals are best known as correlates of emotions (for review, see Ellsworth & Scherer, 2003). However, they are also associated with a wide range of processes that include coping (Lazarus & Folkman, 1984), psychological symptoms (Folkman, Lazarus, Gruen, & DeLongis, 1986), and physiological responses (Tomaka et al., 1999). In addition, specific appraisals are linked to distinct action tendencies (Frijda et al., 1989). For example, appraisals of control and goal-attainability are likely to be associated with approach strategies in goal-pursuits, and appraisals of uncertainty and external control can trigger retreat from goals.

Therefore, the study of how needs are related to appraisals is important for reasons beyond mere descriptive taxonomy. The psychological properties of appraisals can help future studies account for the consequences that each need lead to. For example, past studies found that fulfillment of competence needs boosted interest in laboratory tasks (Deci, 1971; Vallerand & Reid, 1984) and environments that provided desired relationships promoted academic motivation and performance (Grolnick & Ryan, 1989; Ryan, Stiller, & Lynch, 1994). But still left unanswered is the question of how needs influence the social-cognitive processes that shape the way people approach these and other laboratory and naturalistic challenges. For example, if competence is more strongly associated with the appraisal of internal control than relatedness, then there is reason to posit that high competence individuals are more likely than high Relatedness individuals to pursue goals by personal effort. Therefore, by understanding the relationships between needs and appraisals, SDT researchers can draw from the relationships between appraisals and variables such

as coping and action tendencies to gain insights into how needs motivate behaviors and shape the chances of goal attainment.

Also, SDT posits that how individuals evaluate and relate to the environment can determine whether basic needs are satisfied or frustrated (Deci & Ryan, 2000). Because of individual differences in how people regulate the way they construe and interpret events, the theory predicts that as a consequence different people achieve varying degrees of needs-fulfillment (Ryan & Connell, 1989). However, the exact evaluative patterns or tendencies (i.e., appraisals) that predict fulfillment or thwarting of specific needs are never clearly specified or empirically examined. This does not imply that appraisals are the sole determinants of needs-fulfillment, but the point is that knowledge of how needs are associated with appraisals can improve understanding on the conditions under which needs are met.

In sum, SDT proposes that needs comprise subsystems involving affect, evaluative processes, motivation, and others, which influence each other in dynamic and recurring ways (Deci & Ryan, 2000). Past research has examined most subsystems but has given comparatively less attention to the evaluative subsystem which appraisals are part of. This study addressed this issue by examining the relationships between needs and appraisals. Given the nature of our data, it is not possible to definitively show how appraisals lead to needs or how appraisals mediate the effects of needs. This would require manipulation of appraisals and needs and measuring the outcome variables affected by needs. Our study is aimed at providing the first step of showing how each need is related to appraisals which is of relevance to the development of SDT.

We examined ten appraisals (pleasantness, goal conduciveness, effort, perceived control, certainty, agency-self, agency-others, agency-circumstances, unfairness, and moral violation), all of which are the major appraisals in most appraisal theories (Roseman, Dhawan, Retttek, Naidu, & Thapa, 1995; Scherer, 1997; Smith & Ellsworth, 1985; see the appendix for the appraisals). Some straightforward predictions can be made. Given that competence and relatedness tend to produce pleasant experiences and involve attainment of goals (Ryan et al., 1994; Sheldon & Niemiec, 2006), we predicted that fulfillment of these needs should be positively related to pleasantness and goal-conduciveness. Because these needs are positively associated with vitality, confidence, and improved performance (Grolnick & Ryan, 1989; Reis et al., 1996; Ryan et al., 1994), we expected them to be positively related to perceived control and certainty. No predictions were made for the other appraisals because of a lack of prior findings. More important, we examined whether this fairly large number of

appraisals could be meaningfully clustered into a parsimonious set of higher order appraisal factors and then tested how competence and relatedness were associated with these factors.

Of importance, we studied these processes as they occurred in natural contexts. We used an experience-sampling method that tracked and examined the daily fluctuations of the variables (through a day's period) in naturalistic contexts. Police officers from Singapore served as participants with measurements taken "online" as they were working. This design affords high ecological validity in that it involved a nonundergraduate sample; variables that were measured as and when they occurred; and data collected from nonlaboratory, naturalistic conditions.

## METHOD

### Participants

Participants were 118 male police officers from the Singapore Police Force. Mean age was 27.3 years (range = 19–50). Participants comprised the three dominant ethnic groups in Singapore—Chinese ( $n = 39$ ), Indians ( $n = 46$ ), and Malays ( $n = 33$ ).

### Procedure

Data for this study were taken from the ambulatory section of a larger study on cardiovascular reactivity to stress among police officers. Findings from the cardiovascular data are reported in other papers (Enkelmann et al., 2005). Participation was encouraged by a presentation on the relevance of the study to police work and by a lucky draw incentive with the first prize being a shopping voucher worth S\$700 (approximately US\$412). Participation was fully voluntary and confidentiality was assured by telling the officers that no one outside of the research team, including their superiors, would have access to their data.

In the ambulatory section, a blood pressure monitor was attached to each officer throughout his morning shift, which included a variety of police activities such as patrolling and desk work. The monitor was activated at approximately 30-min intervals, after which a questionnaire (which contained the relevant items) installed on a palmtop computer was to be filled out. Participants were not told when the monitor would be activated. Because the monitor was not activated exactly at every 30 min but with a random deviation of 10 min around that period, the activation appeared random to the participant. Because the measurements were time-stamped, we could determine that all observations were given at about the requested time. Data collection began at 8 a.m. and ended between 3 p.m. and 6 p.m. depending on the participants' availability. Participants could

contribute as many as 21 observations, and on average each participant gave about 16 observations. In all, 2,079 observations were obtained. Before 8 a.m., each participant was hooked up to the monitor while usage of the palmtop computer was explained. The officers were told that they need not respond to the questionnaire should the monitor be activated when they were busy. The questionnaire was in English, in which all participants were fluent. After data collection, participants were debriefed and thanked.

### Measures

**Needs.** Participants answered the competence items with reference to any activities done in the past 10 min and the relatedness items with reference to any social-interaction in the past 10 min. Because the officers participated while working, the palm questionnaire was kept brief with two items for each need. The items were modeled after those in past studies (e.g., Reis et al., 2000). Competence was assessed with "Were you able to control important things?" and "Were you able to handle difficulties?" ( $\alpha = .81$ ). Relatedness was assessed with "Was someone was helpful or supportive of you?" and "Are you satisfied with the interaction" ( $\alpha = .69$ ). All items were rated on 4-point scales ranging from 1 (*not at all*) to 4 (*very much so*).

**Emotions.** Participants was instructed to focus on "What you are feeling now?" and to rate the six items that followed (anger, sadness, fear, guilt, shame, and joy) on 5-point scales that ranged from 1 (*not at all*) to 5 (*extremely*).

**Appraisals.** Participant was to "focus on whatever that is on your mind right now" and then rate the appraisal items on 5-point scales with options labeled according to the appraisal (see the appendix). In contrast to past appraisal studies where participants focused on an event, we had our participants focused on their current thoughts based on the assumption that one's thoughts are a more proximal influence than the current situation; note that the participants might not be paying attention to the current situation. When no thoughts were on their minds, they were instructed that the proper response would be *not at all* or *neutral*.

Note that the emotions and appraisal items did not refer to the activities referred to in the needs items. We wanted to examine generalized emotion and appraisal structures—emotions and appraisals that were not tied to the events that triggered these needs and that could be generalized and applied to other current experiences. To avoid taxing the officers, single items were used to

measure emotions and appraisals. Using single-items is a standard practice in appraisal research and these items were taken or adopted from past appraisal studies (e.g., Scherer, 1997; Smith & Ellsworth, 1985), which have found predicted appraisal-emotion relationships from these items. Hence, we are confident of the psychometric strengths of these items.

## RESULTS

### Descriptive Statistics

All descriptive statistics are presented in Table 1. The distribution for competence was skewed to the left and was normalized with a square-root transformation; subsequent analyses employed this normalized variable. The mean and standard deviation for competence, however, were computed from raw scores. The relationships between emotions and appraisals largely conform to predictions of appraisal theories and are reported in other papers (Tong et al., 2005, 2007). To examine the relationship between competence and relatedness, we first standardized each need variable at within-participant levels and then correlated these standardized scores (Hox, 2002). The results showed that both needs were not related to each other,  $r(117) = .12, ns$ .

### Main Analyses

**Analytical strategy.** Our analytical goals were to estimate within-participant relationships between needs

TABLE 1  
Means and Standard Deviations of Needs, Emotions,  
and Appraisals

	<i>M</i>	<i>SD</i>
Needs		
Competence	3.14	0.71
Relatedness	2.58	0.82
Emotions		
Anger	1.35	0.71
Sadness	1.24	0.56
Fear	1.17	0.50
Guilt	1.09	0.34
Shame	1.44	0.32
Joy	2.58	1.15
Appraisals		
Pleasantness	3.09	0.85
Goal-conduciveness	3.05	0.81
Perceived control	3.22	1.06
Certainty	2.74	1.02
Effort	2.61	0.88
Agency-self	2.32	1.07
Agency-others	2.46	1.06
Agency-circumstances	2.44	1.04
Unfairness	1.95	1.01
Moral violation	1.86	0.97

on one hand, and emotions and appraisals on the other hand. Hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002) was employed. We prefer HLM to simple correlational analyses since HLM can adjust for measurement errors and accommodate missing data. In each analysis, competence and relatedness, both person centered, were entered simultaneously as within-participant predictors of an emotion or appraisal, as follows.

$$\text{Emotion/Appraisal} = \beta_0 + \beta_{\text{Competence}} \times \text{Competence} + \beta_{\text{Relatedness}} \times \text{Relatedness} + e,$$

$\beta_0$  indicates the cross-participant average level of the criterion variable;  $\beta_{\text{Competence}}$  and  $\beta_{\text{Relatedness}}$  indicate the average within-participant relationship between the criterion variable, and competence and relatedness, respectively;  $e$  is the error term. The independent contributions of competence and relatedness were examined since these needs are posited as independent systems (Deci & Ryan, 2000). As preliminary analyses, ethnicity was entered (as two appropriately coded dummy variables) to predict  $\beta_0$ ,  $\beta_{\text{Competence}}$ , and  $\beta_{\text{Relatedness}}$  for all criterion variables. Considering that only one significant moderating effect was found out of the many analyses carried out (Indians showed a stronger negative relationship between Relatedness and Shame than Malays), this might just be a chance finding. Hence, there was no strong evidence that ethnicity would affect the main results and it was not considered further.

**Emotions.** As expected, competence and relatedness were negatively related to anger and sadness and positively related to joy (Table 2). Also, competence was negatively associated with Fear.<sup>1</sup> Both needs were not associated with guilt and shame. Finally, previous studies only examined global negative affect variables that were computed from multiple negative emotion items (e.g., Reis et al., 2000; Sheldon et al., 1996). To replicate these findings, we averaged the five negative emotions and regressed the composite negative affect (Cronbach's  $\alpha = .79$ ) onto competence and relatedness in a similar HLM within-participant model. As shown in Table 2, negative emotions was negatively related to both competence and relatedness.

**Appraisals.** As shown in Table 2, competence and relatedness were positively associated with pleasantness,

<sup>1</sup>The negative emotions were reported very infrequently and their distributions followed Poisson distributions. This was commonly found in other studies (e.g., Williams, Suls, Alliger, Learner, & Wan, 1991). An alternative way to analyze the negative emotions is Poisson regression. Similar results were obtained when Poisson regressions were used.

TABLE 2  
Emotions and Appraisals as a Function of Competence and Relatedness

	Competence		Relatedness	
	$\beta_{Competence}$	SE	$\beta_{Relatedness}$	SE
<b>Emotions</b>				
Anger	-.41**	.15	-.13***	.03
Sadness	-.41**	.13	-.05*	.02
Fear	-.32*	.13	-.01	.02
Guilt	-.03	.06	-.01	.01
Shame	.03	.09	-.01	.01
Joy	.58**	.16	.35**	.05
Composite: Negative affect	-.22*	.09	-.05***	.01
<b>Appraisals</b>				
Pleasantness	.62***	.16	.21***	.05
Goal-conduciveness	.45**	.14	.19***	.04
Perceived control	.70**	.21	.12*	.05
Certainty	.31 <sup>†</sup>	.18	.12**	.04
Effort	.02	.15	.07	.04
Agency-self	-.08	.20	.03	.04
Agency-others	-.09	.18	.08 <sup>†</sup>	.04
Agency-circumstances	-.04	.17	.07	.05
Unfairness	-.25	.19	-.10**	.04
Moral violation	-.54**	.19	-.03	.04
Composite: Mastery	.03*	.01	.11 <sup>†</sup>	.07
Composite: Morality	.01	.01	.12**	.04

<sup>†</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

goal-conduciveness, and perceived control. Relatedness was also positively related to certainty. Two other relationships, not predicted a priori, were found: Competence was negatively related to moral violation and relatedness was negatively related to unfairness. The relationship between competence and certainty and that between relatedness and agency-others were marginally significant. However, because HLM is already a statistically powerful technique, the reliability of these relationships should be taken with caution.

To make sense of this array of findings, we then examined whether the appraisals could be meaningfully grouped into higher order factors. Unlike the emotions, there were no prior findings in the needs literature to posit a priori how the appraisals might cluster. Hence, we conducted a factor analysis with varimax rotation on the pooled within-participant correlation matrix of the appraisals (Heck, 1999). The analysis showed three factors with eigenvalues larger than 1 but the screeplot indicated a clear two-factor solution. Hence, the two-factor solution was adopted (see Table 3). Factor 1, Mastery, primarily concerns perceived goal-attainability, high sense of internal control, and perceptions that events were less controlled by external forces. Factor 2, morality, mainly concerns the extent to which events were deemed as upsetting standards of morality and fairness. Items in each factor were averaged. Higher scores on mastery reflect stronger perception that one

TABLE 3  
Factor Analysis of Ten Appraisal Dimensions

	Factor 1: Mastery	Factor 2: Morality
Pleasantness	<b>-.785</b>	.162
Goal-conduciveness	<b>-.741</b>	.290
Agency-circumstances	<b>.650</b>	-.131
Agency-others	<b>.628</b>	-.076
Control	<b>-.559</b>	.219
Effort	<b>.436</b>	.020
Agency-self	.236	<b>.770</b>
Moral violation	.307	<b>-.746</b>
Certainty	-.259	<b>.683</b>
Unfairness	.526	<b>-.637</b>
Variance counted for	38.01%	13.79%

Note. High-loading items are in bold.

could influence the environment in favor of personal goals. Higher scores on morality indicate stronger perceptions of morality and fairness. It is noteworthy that this solution parallels similar two-dimensional structures found in other research showing that traits, values, stereotypes, and person perception can be described by an agentic/competence dimension or a social/moral dimension (Fiske, Cuddy, Glick, & Xu, 2002; Judd, James-Hawkins, Yzerbyt, & Kashima, 2005; Rosenberg, Nelson, & Vivekananthan, 1968).

We performed two HLM within-participant regressions in which each appraisal factor was regressed onto competence and relatedness simultaneously. As shown in Table 2, competence was positively associated with mastery but only marginally with morality. However, relatedness was positively associated with morality but not with mastery. Therefore, fulfillment of competence needs was associated with perceptions of control over the environment and fulfillment of relationship needs tended to be accompanied by seeing events as fair and consistent with moral standards.

## DISCUSSION

In the framework of SDT, fulfillment of needs is conceptualized as experiences that enhance well-being. A challenge for needs researchers is to determine exactly how, at the process level, fulfillments of needs produce the various psychological benefits (e.g., greater interest in laboratory task, better academic performances) that are often documented in the literature (Deci & Ryan, 2000). Given that emotions and appraisals have distinct antecedents and consequences, examining their relationships to needs should help future studies to elucidate the mechanisms underlying needs systems. In this study, using experience-sampling, we found that fluctuations

of competence and relatedness were related to fluctuations of emotions and appraisals in theoretically expected ways, revealing novel information about the emotion and appraisal profiles of competence and relatedness.

Past studies have shown that a sense of competence and having fulfilling social networks are sources of global positive emotionality (Reis et al., 2000; Sheldon & Niemiec, 2006; Sheldon et al., 1996) but have never shown how they relate to specific emotions. This study adds to this literature by showing that competence and relatedness are negatively associated with anger and sadness and positively associated with joy. In addition, competence but not relatedness was negatively associated with fear. This suggests that fear can arise when the needed sense of competence is not felt, but the lack of satisfying social relationships does not necessarily elicit fear. Guilt and shame were not related to any need. We suspect that this is due to the small number of guilt and shame experiences reported; the percentages of total observations in which guilt and shame were reported (i.e., rated between 2 to 5) were only 7.5% and 6.4%, respectively. Further research is needed to explore whether competence and relatedness are related to guilt and shame. Beyond this limitation, these results suggest that the relationships between needs and psychological properties of anger, sadness, fear, and joy (e.g., the distinct action tendencies and coping styles associated with each emotion) should be further explored to understand how needs predict performance-related outcomes.

More important, competence and relatedness were associated with distinct appraisal structures. Although both needs shared somewhat overlapping profiles of individual appraisals (in particular, perceived pleasantness, goal-conduciveness, and internal control), their differentiated appraisal structures are most evident at the level of higher order appraisal factors. Competence was positively and significantly related only to mastery, which means that those who feel a sense of competency and effectiveness in their endeavors tend to appraise the environments as within their control and their goals as attainable. Competence was only marginally related to morality, which means that the reliability of this relationship is for now questionable. In contrast, relatedness was positively related only to morality and not mastery. We think that this suggests that those who feel satisfied with their social relationships tend to be more sensitive and attentive to issues about fairness and morality between people. The fact that the dual-systems of competence versus relatedness correlated in parallel ways with the two-dimensional appraisal structure of mastery versus morality is consistent with findings that intra-personal and interpersonal perceptions can be accounted for by the two-dimensional structure of

agentic/competence versus social/moral attributes (e.g., Fiske et al., 2002; Judd et al., 2005).

To our knowledge, this is the first study that documents in detail the appraisal properties of competence and relatedness. How do these findings contribute to a deeper understanding of needs? As posited by Deci and Ryan (2000), needs are complex systems with social-cognitive variables playing crucial roles in facilitating transactions with the environment. Drawing from this model, we propose that appraisals may influence needs at two levels—as contributing factors to these needs and as mediators of their effects. Regulatory strategies that facilitate the achievement of goals are likely to be instrumental in eliciting a sense of competence (i.e., competence). Mastery would be useful for this purpose as it can gear up the individual to pursue important goals. Similarly, it is possible that a reason why individuals higher on competence are more likely to obtain valued goals is because they are primed to appraise themselves as capable of obtaining them. Hence, high competence individuals, being more likely to think of themselves as in control and their goals as attainable, should be more motivated at approaching their goals, even increasing the chances of getting them. An enhanced awareness of the moral issues involved in interpersonal dynamics (i.e., morality) is likely to encourage behaviors that obey social and moral norms. This in turn should facilitate the formation and maintenance of satisfying social relationships (i.e., relatedness). Because high relatedness individuals are more likely to maintain fulfilling social networks due to their sharpened sensitivity to social issues, it is plausible that they are thus more likely to continue reaping the benefits of social support. More research, based on the current findings and using experimental techniques, is needed to examine the causal processes between needs and appraisals outlined here.

SDT also proposes a third need. Autonomy refers to the sense of feeling autonomous and self-determined in one's action. Regrettably, this study does not contain a valid measure of autonomy and hence fails to provide details about its emotion and appraisal profiles. However, given the important roles Autonomy plays in psychological well-being (Sheldon et al., 1996) and the fact that emotions and appraisals are likely to be associated with similar outcomes, examining the relationships between autonomy, emotions, and appraisals is clearly another area for future studies to fill in.

This research has some limitations that should be mentioned. Given the nature of our data, no causal conclusions can be drawn. Further, the use of self-reports has known limitations. Finally, it is not clear whether there are other appraisals not examined here that might differentiate these needs further. However, there are notable methodological strengths in the current study.

We went beyond undergraduate samples by using police officers, beyond laboratory conditions by employing naturalistic contexts, and beyond retrospective or imagined assessments by recording variables online. This supports the ecological validity of our data. The fact that the current sample is an Asian sample suggests cross-cultural validity of SDT.

To conclude, our study provides a glimpse into how needs, emotions, and appraisals are experienced in everyday life. Changes in needs are accompanied by corresponding changes in emotions and appraisals. These relationships are consistent with the SDT, which states that optimal human functioning depends on the extent to which basic human needs are met.

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## APPENDIX

### Appraisal Items for Electronic Questionnaire

*Pleasantness*: "How pleasant/unpleasant is this event?" [bipolar]

*Goal-conduciveness*: "To what extent are you getting what you desire/expect?" [unipolar]

*Perceived control*: "How much control do you have over the event?" [bipolar]

*Certainty*: "To what extent are you certain or uncertain about what will happen next?" [bipolar]

*Effort*: "How much personal effort (mental or physical) do you think you need to put in to deal with it?" [unipolar]

*Agency-self*: "To what extent are you responsible for event?" [unipolar]

*Agency-others*: "To what extent are other people responsible for the event?" [unipolar]

*Agency-circumstances*: "To what extent is it due to impersonal circumstances (other than by yourself or other people)?" [unipolar]

*Unfairness*: "Do you find it unfair/undeserved/illegitimate?" [unipolar]

*Moral violation*: "To what extent are your beliefs about what is right and wrong being violated?" [unipolar]

The above indicates the appraisal dimensions (in italics), the items, and the type of scale employed (in parentheses). For example, for certainty, a bipolar scale was used which ranged from 1 (*very uncertain*) to 5 (*very certain*) and for agency-self, a unipolar scale was used which ranged from 1 (*not at all*) to 5 (*totally due to me*).



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