

## The relative importance of needs among traumatized and non-traumatized samples

Patrick J. Carroll · Robert M. Arkin ·  
Steven D. Seidel · John Morris

Published online: 1 September 2009  
© Springer Science+Business Media, LLC 2009

**Abstract** Typically, people rate enhancement needs as more important than security needs to their well-being. Two studies tested whether event valence and prior trauma moderate relative need importance. Traumatized (hurricane survivors) and non-traumatized (control) participants recalled the most “distressing” (security-relevant) or “satisfying” (enhancement-relevant) event they had recently experienced and rated the importance of 10 needs in defining the event. In both studies, event valence moderated relative need importance on explicit (salience) and implicit (affect) measures as enhancement needs were more important for enhancement-relevant (satisfying) events whereas security needs were more important for security-relevant (distressing) events. However, results also suggest that differences in traumatic experience across samples moderated the effect of event valence on relative need importance. Unlike non-traumatized (control) participants, traumatized (hurricane survivors) participants did not reassign greater importance to enhancement over security needs when event valence shifted to enhancement-relevant (satisfying) memories. We close by discussing implications for human motivation.

**Keywords** Enhancement · Security · Self-esteem · Competence · Autonomy · Relatedness · Needs

### Introduction

The study of needs has attracted psychologists for many reasons. First, needs have enormous explanatory power in that a single need can account for a wide range of behaviors. Thus, the need to belong can explain behaviors ranging from why people derogate out-group members to why they develop intimate relationships (Baumeister and Leary 1995). Beyond their explanatory significance, needs have practical significance in that they offer precise recommendations for what can restore health when it is lost. Just as the provision of rain and nutrients restore the dying plant, interventions that fulfill deprived needs can restore human health and thriving (Ryan and Deci 2000). The appeal of needs is further enhanced by suggestions that their explanatory and practical significance for behavior is not limited to a few isolated contexts but, instead, extends across *most* social, cultural, and historical contexts (Baumeister and Leary 1995; Sheldon et al. 2001). Thus, whereas the importance of goals or motives may change across contexts, psychologists can generally depend on the absolute importance of basic needs, across contexts, to understand and predict behavior.

Although the foregoing work suggests that the absolute importance of needs may be stable across most contexts, other work suggests that the *relative* importance of basic needs may be moderated by some contextual factors (Sheldon et al. 2001). For example, certain situational factors (satisfying vs. unsatisfying events) appear to moderate the importance of security *relative* to enhancement (e.g., autonomy) needs even though both categories of

---

This publication was partially supported by Grant No. T32-MH19728 from the National Institute of Mental Health.

---

P. J. Carroll (✉)  
Department of Psychology, The Ohio State University-Lima,  
430C Galvin Hall, 4240 Campus Drive, Lima, OH 45804, USA  
e-mail: carroll.279@osu.edu

R. M. Arkin · J. Morris  
Department of Psychology, The Ohio State  
University-Columbus, Columbus, OH, USA

S. D. Seidel  
Texas A & M University-Corpus Christi, Corpus Christi,  
TX, USA

needs are important to the maintenance and enhancement of mental health (Kasser and Sheldon 2008; Kasser 2002). Moreover, within the broad category of enhancement needs, broad cultural factors (e.g., individualism vs. collectivism) appear to moderate the importance of autonomy *relative* to relatedness needs even though both needs independently enhance mental health (Oishi et al. 1999). The current investigation aimed to extend past work on moderators of relative need importance by conducting two new studies to test whether event valence (security-relevant vs. enhancement-relevant events) and prior traumatic experience (non-traumatic vs. traumatic) represent two additional moderators of the relative need importance.

### Existing models of human motivation

#### *Traditional need hierarchy*

Maslow's hierarchy remains one of the most influential and popular theories of relative need importance (Maslow 1954). Maslow specified 5 needs organized within a hierarchy of relative importance beginning with basic biological (e.g., hunger) and security needs at levels 1–2, followed by belongingness and self-esteem at levels 3–4 and, ultimately, self-actualization needs at level 5. An important feature of Maslow's hierarchy is that the satisfaction of lower needs was a precondition to the pursuit of higher needs. That is, people must first satisfy basic security needs before attempting to satisfy belongingness and self-esteem needs. Moreover, even if security needs are satisfied, people must satisfy belongingness and self-esteem before attempting to satisfy the highest self-actualization need (Maslow 1954).

Related to the strict chain of motivational priority placed on lower before higher needs, Maslow distinguished the highest self-actualization need from the four lower needs in terms of its unique association with the enhancement of well-being rather than the minimization of distress. Specifically, Maslow defined self-actualization as a *being-need* (B-Need), whose satisfaction was associated with the enhancement of well-being whereas he defined the four lower needs as *deficit-needs* (D-Needs), whose deprivation was uniquely associated with psychological distress and illness (Maslow 1954). Thus, Maslow claimed that the failure to satisfy self-actualization needs would not necessarily precipitate mental distress and illness so long as the four lower needs were satisfied. In fact, he suggested that most adults (~98%) would never experience the enhanced well-being that results from satisfying self-actualization needs and, yet, still lead relatively normal lives free of mental distress so long as they could satisfy their basic needs for safety, belongingness, and self-esteem.

#### *Limits of the traditional need hierarchy: rise of reduced 2 level hierarchies*

Despite its intuitive appeal, the 5-level hierarchy has garnered meager empirical support (Sheldon et al. 2001; Wahba and Bridwell 1976). In particular, evidence does not support the strict 5-step sequence of importance whereby people move from the satisfaction of basic physiological and safety needs, to esteem and belongingness needs, through to self-actualization needs.

Although little support has been obtained for Maslow's original 5-level hierarchy, considerable support has been obtained for an alternative 2-level hierarchy consisting of security and enhancement needs (Oishi et al. 1999; Sheldon et al. 2001). Within these reduced hierarchies, the first level consists of basic "security" or "deficit" needs whereas the second level consists of "enhancement" or "growth" needs (Bowlby 1969, 1973; Higgins 1997; Kasser and Sheldon 2008; Wahba and Bridwell 1976). As Maslow, reduced 2-level hierarchies assume that basic physiological and security needs must be satisfied before one can pursue higher level needs (Hart et al. 2005). As Maslow, moreover, these models define physiological and psychological security as deficit needs whose satisfaction predicts minimization of distress rather than the enhancement of well-being (Wahba and Bridwell 1976).

Despite these points of similarity, reduced 2 level hierarchies do differ from Maslow's model. Beyond consolidating the number of levels from 5 to 2 (security vs. enhancement) needs (Bowlby 1969; Higgins 1997; Wahba and Bridwell 1976), reduced hierarchies also extend the classification of enhancement needs to those (e.g., self-esteem and relatedness) that Maslow originally defined as deficit (D-needs) needs (Oishi et al. 1999). Although the precise set of enhancement needs may vary across models, most reduced hierarchies include relatedness, self-esteem, autonomy, competence, as well as self-actualization at this second level (Sheldon et al. 2001). Thus, beyond forsaking the strict 5-step sequence of motivational priority, reduced hierarchies depart from Maslow's model by expanding the original set of enhancement needs whose satisfaction predicted mental health and thriving.

#### *Self-determination theory*

The belief of reduced hierarchies that the category of enhancement needs includes those that Maslow originally defined as deficit needs has gained increasing traction in other contemporary models of human motivation. Self-Determination Theory represents just one model that exalts 3 needs other than self-actualization as the royal roads to enhanced mental health. This model posits that people need to feel effective in their activities (competence), feel their

activities are self-chosen (autonomy), and feel a sense of closeness with significant others (relatedness) to enhance well-being (Deci and Ryan 1985). Thus, similar to reduced 2-level hierarchies, Self-Determination Theory departs from Maslow's model by extending the classification of enhancement needs beyond self-actualization to include competence, relatedness, and autonomy as intrinsic enhancement needs that are all linked to the enhancement of positive well-being rather than the minimization of psychological distress (Ryan and Deci 2000; Sheldon et al. 1996). Moreover, similar to reduced 2-level hierarchies, Self-Determination Theory differs from Maslow's hierarchy in the sense that it has developed a strong empirical backbone (Ryan and Deci 2000). An impressive body of evidence has amassed over the past 20 years to support the unique importance of competence, autonomy, and relatedness for enhanced well-being and thriving (Deci et al. 1994; Ryan 1995; Ryan and Deci 2000; Sheldon et al. 1996).

Despite sharing these differences to Maslow's model, Self-Determination Theory even differs from reduced hierarchies in that it does not consider *any* "need" (e.g., esteem) other than competence, autonomy, or relatedness to be innate enhancement needs. In fact, unlike reduced hierarchy and Maslow's original model, it does not consider esteem or security to be innate needs let alone innate enhancement needs. Although other enhancement motivations (e.g., esteem) may exist, this model focuses on competence, autonomy, and relatedness as the *only* basic enhancement needs that must be satisfied across social, cultural, and historical contexts to enhance well-being (Ryan and Deci 2000).

#### Evaluating the context(s) of need importance

Although the absolute importance assigned to needs transcends most contextual boundaries, evidence suggests that some contextual variables moderate the *relative* importance of different needs. As noted earlier, recent evidence shows that the relative importance of security vs. autonomy, competence, relatedness, and self-esteem needs increased when the contextual factor of event valence changed from satisfying (enhancement-relevant) to unsatisfying (deprivation-relevant) event recollections (Sheldon et al. 2001). Specifically, the final study (Study 3) reported by Sheldon et al. (2001) provided the only direct test of whether relative need importance changed when positive event focus shifted from satisfying to unsatisfying event recollections. Participants recalled either an unsatisfying or satisfying event and then completed explicit and implicit measures of the relative importance of different needs in defining the event recollection. The explicit measure was a 30-item descriptive inventory that asked all participants to rate the extent to which the presence or absence of 10 needs

(e.g., autonomy, competence, relatedness, and security) represented a defining quality of the event (satisfying vs. unsatisfying) memory. So, regarding the security need, participants rated their agreement with the statement, "This event was (satisfying or unsatisfying) because I felt that I (was or was not) safe from threats and uncertainties." Participants were urged to differentiate between types of positive and negative feelings by asking them to "be as discriminating as you can in making these ratings". Based on explicit ratings, participants also ranked the 10 needs from least to most important.

Participants then completed an implicit measure of event-related affect in which they reported the feelings they experienced during the recalled event. The implicit measure of affect provided a supplementary measure that could offset any potential measurement limitations (e.g., response biases) of the primary explicit measure we used of relative need importance. Specifically, participants completed the positive affect/negative affect schedule (PANAS) regarding the event (Watson et al. 1988) by rating the extent to which the event evoked different moods (e.g., happy, sad, scared, proud) on a scale of 1 (Not At All) to 5 (Very Much). Composite positive and negative affect scores were computed by averaging the ratings of positive and negative affect items separately for each participant. Moreover, an affect balance score was computed by subtracting the ratings of negative from positive affect to obtain an overall index of the relative intensity of positive vs. negative event-related affect. As in prior work, the results from the final study showed that enhancement needs (autonomy, competence, relatedness) were higher than security needs on the explicit salience ratings for satisfying experiences. Moreover, as in prior work, the results of their final Study 3 showed that the explicit salience of fulfilled autonomy, competence, relatedness needs accounted for a significant portion of unique variance in positive affect tied to satisfying memories (all  $\beta$ s > .23, all  $p$ s < .01).

Consistent with the present argument, however, these findings show that event valence (satisfying vs. unsatisfying) moderated the relative importance of security vs. enhancement needs on both explicit (salience ratings) and implicit (affect) measures of relative need importance. The results showed a marginal, albeit non-significant, increase in the relative importance of security vs. enhancement needs on the explicit salience ratings when participants recalled an unsatisfying vs. satisfying event experience. As importantly, on implicit affect ratings of need importance, the explicit salience ratings for deprived security needs ( $r = .50, p < .01$ ) vs. enhancement needs of autonomy ( $r = .19, p < .01$ ), competence ( $r = .25, p < .01$ ), relatedness ( $r = .13, p < .10$ ), and self-esteem ( $r = .39, p < .01$ ) showed the highest correlation with negative affect ratings evoked by the unsatisfying event memories.

Finally, in a simultaneous regression model of the affect balance score, the explicit salience of deprived security needs ( $\beta = -.26, p < .01$ ) accounted for a *greater* proportion of unique variance than the only two enhancement needs (Competence,  $\beta = -.22, p < .01$ ; Self-esteem,  $\beta = -.18, p < .05$ ) that emerged as significant predictors in the analyses. Thus, the deprivation of security vs. enhancement needs not only showed a higher correlation with the level of negative affect but also explained more unique variance in the *relative* intensity of negative vs. positive affect evoked by unsatisfying event memories. When taken together, the results across explicit (salience) and implicit (affect) measures suggest that event valence could potentially moderate the relative importance of enhancement vs. security needs.

#### *Re-evaluating the contextual role of event valence*

We propose that Sheldon et al. may have inadvertently underestimated the significance of event valence as a potential moderator of relative need importance based on their finding that the relative importance of security was higher but not significantly higher relative to enhancement needs for unsatisfying vs. satisfying event memories. We suspect that the nature of their operational definition of event valence is the source of this oversight. In our view, their “manipulation” of event valence (satisfying vs. unsatisfying) did not vary event valence at all between bad (security-relevant) vs. good (enhancement-relevant) events but, instead, the positive event focus between the presence vs. absence of good (enhancement-relevant) events only (Higgins 1997). That is, although unsatisfying events are undesired experiences, they are primarily relevant to the deprivation/fulfillment of enhancement needs rather than security needs. A valid manipulation of event valence from the presence of bad (security-relevant) as well as good (enhancement-relevant) events would be required to truly test whether this contextual factor moderates the relative importance of security vs. enhancement needs.

Consistent with this point, prior theorists claim that unique contextual cues define experiences relevant to the deprivation or fulfillment of security and enhancement needs (Higgins 1997). Contextual cues signaling the presence or absence of psychological threat are uniquely associated with the deprivation or fulfillment of security needs whereas contextual cues signaling the presence or absence of opportunity are uniquely associated with the fulfillment vs. deprivation of enhancement needs (Higgins 1997; Kasser 2002). Unlike unsatisfying events, distressing events are inherently relevant to security needs in that they are uniquely defined by salient cues that signal threats to security (Carroll et al. 2006). Consistent with these conceptual claims, empirical evidence indicates that certain

events are primarily defined by the distressing experience of threats to security needs (Kasser and Sheldon 2008). That is, distressing events have more implications for security needs because these events are uniquely defined by salient cues signaling actual (or potential) threats to ongoing security vs. enhancement needs. Most importantly, though, this work suggests that the greater salience of threat (vs. other) cues in distressing events amplifies the importance of security over enhancement needs given the unique implications of threat for the regulation of security needs (Kasser and Sheldon 2008).

Of course, this past work does not suggest that distressing events defined by salient threat cues have no implications for enhancement needs but, rather, that these event experiences have relatively more implications for security than enhancement needs. That is, the distressing events of experiencing threats ranging from terrorist attacks to identity theft stems *more* from the unique implications these experiences have for one’s basic sense of security than for the senses that one is autonomous, effective, and emotionally close to many. We draw from this past work to suggest that the experiential cues that define distressing vs. unsatisfying events provide the more natural cues relevant to security needs. More specifically, though, we draw from this past work to suggest that exposure to threat cues related to security needs should enhance the relative salience of security vs. enhancement concerns and, in turn, the relative importance of security over enhancement needs in motivated cognition. In sum, we propose changes in event valence should qualify the relative importance of enhancement over security needs such that security vs. enhancement needs will assume more importance for distressing (security-relevant) memories whereas, consistent with prior work, enhancement vs. security needs will assume relatively more importance when event valence shifts from distressing (security-relevant) to satisfying (enhancement-relevant) event memories.

#### *Evaluating the contextual role of prior trauma*

Although we predicted that event valence would change the relative importance of enhancement vs. security needs across participants, we also tested whether pre-existing differences in traumatic event experience of hurricane survivors vs. controls would moderate the general tendency to re-assign greater importance to enhancement over security needs as event valence shifted from security (distressing) to enhancement (satisfying) relevant memories. Traumatic events are those that present actual or potential threats to one’s physical integrity and are experienced with intense fear, helplessness, or horror (DSM-IV-TR; APA 2000). Prior work is certainly consistent with the general possibility that pre-existing personal factors (e.g.,

prior traumatic experience) can moderate the relative importance of enhancement as well as security needs across situational contexts. For example, evidence shows that the importance of goals linked to individual enhancement needs diminishes during stressful life transitions (incarceration) from generally nurturant (community) to non-nurturant (prison) environments that no longer support the ongoing pursuit of individual enhancement goals (Kasser 1996). As importantly, though, some of this work shows that prior conditions linked to mental distress (e.g., insecure attachment history) may shape the *relative* as well as absolute importance of enhancement vs. security needs in defining significant situational experiences (Hart et al. 2005; Vasey et al. 1996).

It is also worth noting that some work goes beyond the descriptive to the explanatory level of analyses by exploring the underlying mechanisms that drive the contextual effect of pre-existing conditions related to stress on the relationship between specific situational factors and shifts in the relative importance of enhancement and security needs. First and, perhaps most obvious, some investigators suggest that pre-existing conditions related to stressful life experiences may limit the objective availability of environmental opportunities to satisfy enhancement needs related to self-acceptance and growth. For example, Kasser (1996) notes that prisons actually restrict the continued pursuit of inmates' individual needs for autonomy and control that might compromise the greater institutional need for order and security.

Beyond objective mechanisms (e.g., non-supportive prison environment), prior work suggests an important subjective mechanism that can account for the contextual effect of pre-existing stress conditions on situational shifts in relative need importance. This work suggests that pre-existing stress conditions (e.g., insecure attachment history) shape the relative importance of enhancement vs. security needs by creating a negativity bias that gears information-processing toward potential threat cues to the relative neglect of clear reward cues in new situations (Hart et al. 2005; Vasey et al. 1995). For example, clinical work shows that children with a history of test anxiety display an overwhelming bias for processing threat over clear reward cues in new testing situations (Vasey et al. 1996).

More importantly, there is direct evidence for the unique association between the pre-existing condition of traumatic experience and a negativity bias across a wide range of specific traumatic experiences, including natural disasters (earthquakes), violent crime (rape), and major accidents (e.g., automobile crash; Amir et al. 1996; Brewin et al. 1996a; McNally et al. 1990, 1987; Thrasher et al. Yule 1994). These findings provide direct precedence for the specific claim that the *specific* pre-existing condition of traumatic event experiences precipitates the development

of a chronic negativity bias that amplifies the salience of any risk cues signaling potential threats to satisfying security needs to the relative or complete neglect of even clear reward cues signaling realistic opportunities to satisfy enhancement needs (Amir et al. 1996; Brewin et al. 1996b; McNally et al. 1990). Drawing from this work, we propose that prior traumatic experience creates a negativity bias that inhibits the typical need effect such that people who have (vs. have not) experienced a prior trauma will not rate enhancement needs as more important than security needs even for enhancement-relevant experiences.

### Investigative overview and hypotheses

To summarize, this investigation adds to prior work by testing whether the contextual variables of event valence and prior trauma qualify the relative importance of basic needs. Across two samples, we predicted (Hypothesis 1) that event valence would moderate relative need importance such that participants would assign greater importance to enhancement over security needs for enhancement-relevant situations (satisfying events) whereas they would assign greater importance to security over enhancement needs for security-relevant situations (distressing events). However, we also predicted (Hypothesis 2) that pre-existing differences in prior traumatic experiences of hurricane survivors vs. controls would moderate the effect of changes in event valence from distressing to satisfying memories on relative need importance. Among participants in the non-traumatized sample, we predicted that the typical need effect would be found such that enhancement needs would be rated as more important than security needs for enhancement-relevant events. Among participants in the traumatized sample, however, we predicted that the typical need effect would not be found such that enhancement needs would not be rated as more important than security needs even for enhancement-relevant events.

### Study 1 method

The first purpose of Study 1 was to replicate the basic pattern of relative need importance for satisfying event memories found in Study 3 reported by Sheldon et al. (2001). We adapted the same procedure and measures of need importance (implicit affect and explicit salience ratings) used in that study to limit any methodological differences to *one* critical modification of the event valence manipulation necessary to test our hypothesis. Specifically, we substituted distressing (security-relevant) for unsatisfying (enhancement-relevant) events to represent the full range of variation on event valence from good events

linked to enhancement needs to bad events linked to security needs. This change enabled us to fully test the contextual role of event valence in shaping the importance of security vs. enhancement needs across distressing (security-relevant) as well as satisfying (enhancement-relevant) event memories.

### Participants

We recruited 120 students ( $M = 41$ ;  $F = 79$ ) enrolled in different courses (72% psychology, 12% business, and 16% communications) at the main and regional campuses at The Ohio State University to participate in exchange for course credit. Participants completed two demographic measures by listing their ethnicity/race as well as estimating their annual income for the current and past year. Participants also completed a measure of overall event-related stress by rating how much overall stress they had felt following the (distressing or satisfying) event on a 1 (None at All) to 7 (A Great Deal) response scale. The sample consisted of 41% African American and 59% European American participants with a self-reported annual income estimate that ranged from \$20,000 to \$80,000 and a mean income estimate of \$38,899.

### Procedure

This experiment used a survey methodology consisting of three parts. Participants were randomly assigned to 1 of 2 survey versions that varied only with respect to the event valence (satisfying vs. distressing). Ultimately, this study used a single factor (Event Valence: Satisfying vs. Distressing) between subjects design. The first section of the questionnaire included an adapted version of the event recall exercise (see Appendix) used by Sheldon et al. (2001) that was identical to the original in every way except for the modifications required to accommodate our broader manipulation of event valence from satisfying to *distressing* experiences rather from satisfying to *unsatisfying* experiences. Thus, the first section asked participants to recall the single most satisfying (enhancement-relevant) or distressing (security-relevant) event that they had experienced within the last month.

Next, participants proceeded to the second section of the questionnaire that included the 30-item descriptive inventory and corresponding instructions developed by Sheldon et al. as an explicit measure of relative need importance. This inventory requires participants to rate the relative salience of the presence or absence of 10 needs (3 for each need) in defining their recollection of motivationally significant (satisfying vs. distressing) events, using a 1 (*not at all*) to 5 (*very much*) scale. As in the original paradigm, participants were urged to differentiate between types of

positive and negative feelings evoked by the event memory in their ratings by asking them “be as discriminating as you can be in making these ratings”.

To further minimize any methodological discrepancies, all statements began with the same stem used in the final study reported by Sheldon et al. (2001) that tested the contextual effect of event valence. Thus, all items began with the original stem wording: “This event was (satisfying or distressing) because I felt...” The careful preservation of these features of the original questionnaire ensured that the only difference between our study and this past work were the accommodations required for the modified manipulation of event valence (replacing “unsatisfying” for “distressing” experiences in the negative event recall condition). Consistent with this past work, the 3-item subscales corresponding to each of the 10 psychological needs displayed adequate inter-item consistency in this sample (all  $\alpha$ s > .75). As in Sheldon’s paradigm, salience scores were computed for each of the 10 needs by averaging the 3 items relevant to that need. Table 1 presents 1 sample item for each of the 10 needs.

**Table 1** Need importance inventory

Item responses to “This event was (satisfying or distressing) because...”	
1. Autonomy	I felt that I (was or was not) free to do things my own way
2. Competence	I felt that I (was or was not) successfully completing difficult tasks and projects
3. Relatedness	I felt that I (was or was not) close and connected with other people who are important to me
4. Self-actualization-meaning	I felt that I (was or was not) “becoming who I really am.”
5. Physical thriving	I felt that my body (was or was not) getting just what it needed
5. Pleasure-stimulation	I felt that I (had or had not) found new sources and types of stimulation for myself
6. Money-luxury	I felt that I (was or was not) able to buy most things I want
7. Security	I felt that I (was or was not) safe from threats and uncertainties
8. Self-esteem	I felt that I (did or did not) have many positive qualities
9. Popularity-influence	I felt that I (did or did not) strongly influence others’ beliefs and behavior

*Note:* For each item, the wording for questionnaire versions in the satisfying and distressing event recall conditions appears in parentheses

Affect measures

The final phase adapted the same implicit measure of event-related affect used by Sheldon et al. to supplement the explicit measures of need importance. As noted by Sheldon et al. (2001), the inclusion of the implicit affect measures compensates for any potential biases associated with participants’ explicit ratings of the most salient features of their event recollections. Adapting the paradigm used by Sheldon et al. we obtained the implicit measure of need importance by having participants complete the PANAS of event-related affect in which they rated the extent to which they felt each of 20 different moods during the event using a 1 (*not at all*) to 5 (*very much*) scale. The PANAS contained mood adjectives such as *scared*, *hostile*, *inspired*, and *proud*. This scale consists of a positive affect subscale as well as a negative affect subscale. Consistent with past work, both the positive affect subscale and the negative affect subscale displayed excellent inter-item consistency in this sample (both  $\alpha$ s > .89). As in Sheldon’s paradigm, moreover, positive and negative affect scores were computed by separately averaging the 10 positive affect ratings and then averaging the 10 negative affect ratings to create two separate scores for positive and negative affect, respectively.

Results

Preliminary analyses

Table 2 presents the means and standard deviations for the 10 needs separately in the two conditions of event valence (satisfying vs. distressing).

**Table 2** Study 1. Mean salience of each need within low trauma sample across event valence

Distressing ( <i>N</i> = 61)		Satisfying ( <i>N</i> = 59)	
Need rank	<i>M</i> (SD)	Need rank	<i>M</i> (SD)
Low security	3.3 (0.5) <sup>a</sup>	High self-esteem	4.4 (0.6) <sup>a</sup>
Low competence	2.8 (0.9) <sup>b</sup>	High autonomy	4.2 (0.7) <sup>a,b</sup>
Low autonomy	2.7 (0.9) <sup>b,c</sup>	High competence	4.1 (0.8) <sup>b,c</sup>
Low relatedness	2.7 (1.0) <sup>b,c</sup>	High self-actualize	3.9 (0.9) <sup>c,d</sup>
Low pleasure	2.6 (0.8) <sup>b,c</sup>	High relatedness	3.8 (1.1) <sup>d</sup>
Low self-esteem	2.6 (1.0) <sup>b,c</sup>	High security	3.8 (0.7) <sup>d</sup>
Low self-actualize	2.5 (0.8) <sup>c,d</sup>	High pleasure	3.6 (0.9) <sup>d,e</sup>
Low physical	2.5 (0.9) <sup>c,d</sup>	High physical	3.5 (1.1) <sup>e</sup>
Low popularity	2.5 (0.9) <sup>c,d</sup>	High popularity	3.3 (1.0) <sup>e</sup>
Low money	2.3 (0.9) <sup>e</sup>	High pleasure	2.8 (1.1) <sup>f</sup>

Note: For each measure, means (within columns) with different superscripts differ at  $p < .01$

We conducted a series of dependent samples *t*-tests comparing the salience ratings for security needs against the separate salience ratings for each of the enhancement needs (autonomy, competence, relatedness, and self-esteem). To control for the potential inflation of type 1 error rates in multiple comparisons, we used the more stringent  $p < .01$  criterion over the conventional  $p < .05$  criterion for judging statistical significance. These analyses tested whether our manipulation of event valence would produce a significant shift in the importance of enhancement vs. security needs such that the deprivation of security vs. enhancement needs would be rated as more salient for distressing (security-relevant) memories whereas the fulfillment of enhancement vs. security needs would be rated as more salient for satisfying (enhancement-relevant) memories. As predicted, results showed that participants rated the deprivation of security vs. all 4 enhancement needs as a more salient feature of “distressing experiences”, all *t*s (59) > 2.29, all *p*s < .01, all *d*s > .30, whereas participants rated the fulfillment of 3 enhancement needs (autonomy, competence, and self-esteem) vs. security as more salient features of “satisfying experiences”, all *t*s (57) > 2.23, all *p*s < .01, all *d*s > .30, though they did not rate relatedness vs. security as a more salient feature of their “satisfying experiences”,  $t(57) = .00$ ,  $p = 1.00$ ,  $d = 00$ .

Associations of need satisfaction with affect

Table 3 presents the correlations of each of the 10 needs with event-related positive and negative affect across conditions of satisfying and distressing experiences. With the exception of money and physical needs, the pattern of correlations for distressing events shows that the deprivation of all candidate needs correlated with negative affect. With the exception of money and popularity, the pattern of correlations for satisfying events shows that 8 out of the 10 needs correlated with positive affect.<sup>1</sup>

Regression comparisons

We conducted simultaneous regression analyses to test the relative importance of all needs in predicting affect across satisfying and distressing experiences. Specifically, we entered in all 10 needs simultaneously as predictors of positive and negative affect. Unlike standard correlational analyses, the simultaneous regression analyses enabled us to extract all common variance and obtain pure indices of

<sup>1</sup> Although one could argue that popularity is a basic interpersonal enhancement need, evidence suggests that popularity is not a basic need in itself but, instead, an extrinsic goal that serves more basic needs directly linked to well-being (Kasser and Ryan 1996).

**Table 3** Study 1. correlations of candidate needs with event-related affect, separately for distressing & satisfying events

	Distressing ( <i>N</i> = 61) Negative affect		Satisfying ( <i>N</i> = 59) Positive affect
Low security	.50**	High security	.31*
Low relatedness	.37**	High relatedness	.25*
Low autonomy	.44**	High autonomy	.49**
Low competence	.48**	High competence	.25*
Low physical	-.16	High physical	.24*
Low self-actualize	.37**	High self-actualize	.45**
Low popularity	.42**	High popularity	.07
Low money	-.04	High money	.04
Low self-esteem	.36**	High self-esteem	.67**
Low pleasure	.39**	High pleasure	.41**

Note: For each measure,  
\*  $p < .05$ ; \*\*  $p < .01$

the unique variance that each need accounted for in positive and negative affect.

Table 4 presents the coefficients separately for the regression models of positive and negative affect, respectively.

These analyses tested our prediction that the explicit salience ratings for deprived security needs *but not* for any of the enhancement needs of autonomy, competence, relatedness, and self-esteem would account for a significant portion of unique variance in negative affect evoked by distressing (security-relevant) event recollections whereas the salience ratings for the fulfilled enhancement needs but not for security would account for a significant portion of unique variance in positive affect evoked by satisfying (enhancement-relevant) event recollections. Consistent with past work (Sheldon et al. 2001), the centered salience score for the fulfilled enhancement need of self-esteem emerged as a significant predictor of unique variance in positive affect for satisfying events such that the satisfaction of self-esteem needs was associated with elevations in positive affect,  $\beta = .61$ ,  $SE = .19$ ;  $t = 3.26$ ,  $p < .01$ . Consistent only with our unique predictions, however, the centered salience score for the deprived security need emerged as the only significant predictor of unique variance in negative affect for distressing memories,  $\beta = .31$ ,  $SE = .11$ ;  $t = 2.14$ ,  $p < .05$ , whereas the centered scores for all of the separate enhancement needs (autonomy, competence, relatedness, and self-esteem) needs did not account for a significant portion of unique variance in negative affect scores, all  $\beta$ s  $< .25$ , all  $SE$ s  $> .17$ ; all  $t$ s  $< 1.59$ , all  $p$ s  $> .10$ . Thus, the salience of deprived security needs emerged as the only significant predictor of negative affect: the deprivation of security needs predicted elevations in negative affect. The results of these analyses of event-related affect add further support to our prediction that complete shifts in event valence from satisfying (enhancement-relevant) to distressing (security-relevant) event recollections significantly increases the motivational importance of security over each of the enhancement needs of autonomy, competence,

relatedness, and self-esteem on implicit as well as explicit measures of relative need importance.<sup>2</sup>

## Study 1 discussion

Consistent with prior evidence, the results show that enhancement needs are more important than security needs in defining satisfying experiences. Except for relatedness, enhancement needs (autonomy, competence, self-esteem) were rated as more important than security on explicit and implicit measures in participant's satisfying event recollections. As predicted, however, the relative importance of enhancement vs. security needs does depend on the situational context of event valence such that security concerns was rated as more important than all enhancement needs when event valence shifted from recollections of enhancement-relevant (satisfying) experiences to security-relevant (distressing) experiences.

## Study 2 method

Study 2 attempted to extend the findings of Study 1 by testing whether the prior traumatic experience of hurricane

<sup>2</sup> We also re-ran the analyses using the reduced model of negative affect that restricted the predictor terms only to the subset of centered need scores (self-esteem, security, autonomy, competence, and relatedness) directly relevant to our hypotheses regarding changes in relative importance of enhancement vs. security needs across distressing as well as satisfying event memories. For distressing events, the results of the reduced model were consistent with the full model as security deprivation scores accounted for a significant portion of unique variance in negative affect,  $\beta = .31$ ,  $SE = .15$ ,  $t(1, 55) = 2.11$ ,  $p < .05$ , whereas competence, autonomy, relatedness, and self-esteem did not, all  $\beta$ s  $< .25$ , all  $t$ s  $(1, 55) < 1.90$ , all  $p$ s  $> .06$ . For satisfying events, moreover, the results of the reduced model converged with the full model as self-esteem accounted for a unique portion of the variance in positive affect,  $\beta = .69$ ,  $SE = .18$ ,  $t(1, 55) = 3.97$ ,  $p < .05$ , whereas security, competence, autonomy, and relatedness did not, all  $\beta$ s  $< .22$ , all  $t$ s  $(1, 55) < 1.70$ , all  $p$ s  $> .10$ .

**Table 4** Study 1. regression coefficients of needs with event-related affect, separately for distressing & satisfying events

	Distressing ( $N = 61$ ) Negative affect		Satisfying ( $N = 59$ ) Positive affect
Low security	.31**	High security	.06
Low relatedness	-.06	High relatedness	-.06
Low autonomy	.23	High autonomy	.17
Low competence	.25	High competence	.01
Low physical	-.16	High physical	-.04
Low self-actualize	-.08	High self-actualize	.13
Low popularity	.04	High popularity	.01
Low money	-.12	High money	-.07
Low self-esteem	-.11	High self-esteem	.61**
Low pleasure	.24	High pleasure	.13

Note: For each measure,  
\*  $p < .05$ ; \*\*  $p < .01$

survivors (Hurricanes Katrina and Rita) would qualify the effect of changes in event valence on relative need importance observed in the non-traumatized sample of control participants. As in Study 1, we predicted that the relative importance of enhancement vs. security needs would depend on the situational context of event valence such that enhancement vs. security needs would be more important in the recollection of enhancement-relevant (satisfying) experiences whereas security vs. enhancement needs would be more important in the recollection of security-relevant (distressing) experiences. However, we also predicted that pre-existing differences in the prior traumatic experience of hurricane survivors vs. control participants would moderate the effect of event valence on relative need importance. Unlike the non-traumatized sample of control participants (Study 1), we predicted that the traumatized sample of hurricane survivors (Study 2) would not reassign significantly greater importance to enhancement over security needs when event valence shifted from recollections of distressing (security-relevant) to satisfying (enhancement-relevant) situational experiences.

### Participants

The study was held in a living facility located in Corpus Christi, Texas, for displaced refugees from Hurricanes Katrina and Rita. 63 refugees ( $M = 27$ ;  $F = 36$ ) participated in exchange for \$3 cash compensation. The proximity of landfalls for Katrina (August 29, 2005) and Rita (September 21, 2005) coupled with the enhanced sense of urgency to accelerate Rita evacuation efforts in the immediate aftermath of Katrina minimized temporal differences from storm to assessment between Katrina and Rita survivors. In fact, the data from all participants (Katrina and Rita survivors) was collected less than 1 month after both hurricanes.

Participants completed the same overall stress measure and demographic (race/ethnicity, income) measures used in

Study 1 as well as new measures of age and education level. The measure of education level asked participants to list their highest educational experience on a 12-point scale: 1 (grade school), 2 (junior high school), 3 (some high school), 4 (GED), 5 (high school graduate), 6 (1–2 years of college), 7 (3 or more years of college), 8 (Associates Degree), 9 (BA or BS), 10 (some graduate school), 11 (master's degree), 12 (Ph.D, Ed.D, MD, D.D.S., L.L.B, or other professional degree). The sample consisted of 63% African American and 37% European American and the self-reported annual income level ranged from \$5,000 to \$100,000 with a mean of \$34, 527. The self-reported age of participants ranged from 16 to 67 with a mean age of 40 years and the self-reported education level ranged from 2 (junior high school) to 9 (BA or BS) with a mean of 5 (high school degree).

### Procedure

Participants were randomly assigned to 1 of 2 survey versions that varied only with respect to the event valence (satisfying vs. distressing). Ultimately, this study used a single factor (Event Valence: Satisfying vs. Distressing) between subjects design. The Study 2 questionnaire consisted of three sections. The first two sections were identical to Study 1. As in Study 1, participants began with the *Event Recall Exercise* in the first section by recalling either the most satisfying (enhancement-relevant) or distressing (security-relevant) events that they experienced within the last month and, then, proceeded to the second section to complete the modified Need Importance Inventory (Sheldon et al. 2001) consisting of the 3-item subscales rating 10 different needs in terms of the salience of their presence during the satisfying events and absence during the distressing events. As in Study 1, the 3-item subscales corresponding to each of the 10 psychological needs displayed adequate inter-item consistency in this sample (all  $\alpha > .65$ ). The survey ended with an optional open-ended

item that allowed participants to share any information that was not captured in the other questions. The inclusion of these open-ended responses provided a level of resolution to our analyses that could not be captured via sole reliance on constrained explicit or implicit measures.<sup>3</sup>

## Results

### Analyses

Given our prediction that post-traumatic stress rather than demographic variables would represent the critical difference between the traumatized and non-traumatized, we used the overall stress item as a manipulation check to test if participants in the “traumatized” vs. “non-traumatized” sample did display significantly higher levels of psychological stress. As predicted, an independent sample *t*-test revealed that post-event stress was significantly greater in the hurricane sample ( $M = 6.3$ ;  $SD = 1.1$ ) vs. college sample ( $M = 4.9$ ;  $SD = 1.5$ ),  $t(1, 172) = 6.63$ ,  $p < .01$ ,  $d = 1.04$ . Moreover, results of an independent sample *t*-test revealed that the self-reported income was not significantly greater in the college ( $M = \$38,899$ ) vs. hurricane sample ( $M = \$34,355$ ),  $t(1, 172) = .72$ ,  $p > .85$ ,  $d = .18$ .

The results of a between sample chi-square test did show a significant difference between the observed and expected representation of blacks vs. whites across samples,  $\chi^2(1, 179) = 6.68$ ,  $p < .01$ . Ancillary chi-square tests of racial distributions within samples revealed a significantly greater proportion of black vs. white participants in the hurricane sample (63 vs. 37%),  $\chi^2(1) = 4.26$ ,  $p < .05$ , whereas there was not a significantly greater proportion of black vs. white participants in the college sample (41 vs. 57%),  $\chi^2(1) = 2.40$ ,  $p > .15$ . Table 5 presents the means and standard deviations for the 10 needs separately for both conditions of event valence (satisfying vs. distressing).

As in Study 1, a series of dependent samples *t*-tests were conducted to test the pair wise differences between the separate needs. As in Study 1, we used the more stringent probability criterion of  $p < .01$  to control for the inflation of type 1 error in reporting multiple comparisons. Consistent with predictions, results show that event valence moderated the importance of security vs. enhancement needs as security needs vs. enhancement needs were rated

<sup>3</sup> Unfortunately, we had to exclude the PANAS as well as several other measures from the Study 2 questionnaire as the Red Cross had to impose length constraints on the interview experience to fully protect the already compromised mental state of hurricane survivors. We certainly understood the Red Cross’s position and, ultimately, felt that the convergence of the implicit affect measure with the explicit salience measure in Study 1 and in Sheldon’s prior work did not make the replication of this finding in Study 2 an absolute necessity.

**Table 5** Study 2. Mean Salience of Each Need within High Trauma Sample across Event Valence

Distressing ( $N = 31$ )		Satisfying ( $N = 29$ )	
Need rank	$M$ (SD)	Need rank	$M$ (SD)
Low security	4.2 (0.5) <sup>a</sup>	High relatedness	4.1 (0.9) <sup>a</sup>
Low relatedness	3.6 (0.8) <sup>b</sup>	High competence	3.5 (1.0) <sup>b</sup>
Low competence	3.3 (0.8) <sup>b,c</sup>	High autonomy	3.4 (0.8) <sup>b</sup>
Low autonomy	3.2 (0.8) <sup>c</sup>	High self-esteem	3.4 (1.1) <sup>b</sup>
Low popularity	2.8 (1.2) <sup>d</sup>	High security	3.3 (0.8) <sup>b</sup>
Low physical	2.7 (0.9) <sup>d</sup>	High self-actualize	2.1 (0.9) <sup>c</sup>
Low self-esteem	2.3 (0.9) <sup>e</sup>	High physical	2.1 (0.7) <sup>c</sup>
Low self-actualize	2.2 (1.0) <sup>e</sup>	High popularity	2.1 (1.3) <sup>c</sup>
Low money	2.0 (1.1) <sup>e</sup>	High pleasure	1.7 (0.8) <sup>d</sup>
Low pleasure	1.5 (0.7) <sup>f</sup>	High money	1.5 (0.7) <sup>d</sup>

*Note:* For each measure, means (within columns) with different superscripts differ at  $p < .01$

as the more salient feature of “distressing experiences”, all  $t_s(31) > 3.27$ , all  $p_s < .01$ , all  $d_s > .65$ , whereas the enhancement need of relatedness (but not competence, autonomy, or self-esteem) vs. security was rated as the more salient feature of “satisfying experiences”,  $t(31) = 2.27$ ,  $p = .01$ ,  $d = .49$ .

Although these findings further support our primary hypotheses regarding the distribution of importance across the broad categories of security and enhancement needs, one intriguing pattern that emerged in this study among specific needs within the broad category of enhancement needs is worth mentioning. The results suggest that the fulfillment of relatedness needs was more important than the fulfillment of competence, autonomy, or self-esteem in defining enhancement-relevant (satisfying) experiences of hurricane survivors. Although puzzling at first glance, this finding is perfectly consistent with past work on factors that moderate the relative importance of different needs.

This past work suggests that, beyond shifts in relative importance between the broad categories of security vs. enhancement needs, certain contextual factors may moderate the relative importance among specific enhancement needs. For instance, the *values-as-moderators* (Oishi et al. 1999) model of subjective well-being predicts that salient cultural values may moderate the relative importance of interpersonal enhancement (e.g., relatedness) vs. individual enhancement needs (e.g., esteem). Consistent with these findings, past evidence suggests that interpersonal enhancement needs assume greater importance in determining overall life satisfaction within collectivist cultures that value interdependence whereas individual enhancement needs (e.g., competence, self-esteem) assume greater importance within individualistic cultures (Oishi et al. 1999). The present findings may suggest that prior trauma

as well as cultural values may represent a potent moderator of the relative importance among specific enhancement needs. As in Study 1, money and pleasure emerged in the bottom three needs for both distressing and satisfying experiences.

#### Open-ended responses

Although the quantitative analyses of the explicit and implicit scale ratings supported many predictions, quantitative and qualitative analyses of the open-ended responses may provide a richer depiction of how the relative importance of needs shifts within the broader context of life trauma. The analyses of open-ended responses converge with the analyses of scale ratings to suggest that prior trauma moderated the relative importance of security vs. enhancement needs. Specifically, the results of the chi-square analyses showed the frequency of security vs. enhancement need references was significantly greater among hurricane survivors recalling distressing events,  $\chi^2(1, 31) = 32.00, p < .01$ . Although more pronounced for distressing events, even participants recalling satisfying events made significantly more security vs. enhancement need references in their open-ended responses,  $\chi^2(1, 29) = 30.01, p < .01$ . One participant wrote, “Don’t feel safe...Police were shooting at me...added to danger I felt”. Similarly, another participant wrote “I was trapped in my attic...couldn’t sleep, didn’t know how to react to being hungry, afraid, and trapped”.

The quantitative analyses of the open-ended responses converge with those of the scale ratings to suggest that the context of prior trauma may have influenced relative need importance within the category of enhancement needs. The chi-square analyses showed the frequency of references to relatedness vs. individual enhancement needs (autonomy, competence, and self-esteem) was significantly greater among hurricane survivors,  $\chi^2(1, 32) = 10.15, p < .01$ . For example, one participant wrote, “I still have my kids and family and that’s the most important thing”. Similarly, another participant wrote “I lost my house and lost my father-in-law; father-in-law was worst...I learned that you need to hold on more to relationships than stuff.”

Another noteworthy pattern that this example illustrates is that verbal references to the importance of relatedness needs often coincided with a countervailing devaluation of money in the open-ended responses. Consistent with this point, one participant wrote...“Lesson: Most important thing in life is having friends and family—not about \$”. Rather than depicting social relationships as means to obtain wealth and power, these examples support the claim that the pursuit of fame, wealth, and power has little hedonic value outside the context of significant social relationships (Baumeister and Leary 1995). As noted

earlier, though, it is inappropriate to draw any firm conclusions from these findings given the nature and limitations of our design. By the same token, however, they do suggest the need for future work to further examine the potential role of that prior trauma in moderating the relative importance of the interpersonal need for relatedness vs. individual enhancement needs or other needs.

#### Discussion

As predicted, these findings show that the relative importance of enhancement vs. security needs shifted when we varied event valence such that security needs assumed significantly greater importance over all four enhancement needs for security-relevant (distressing) experiences whereas one enhancement need (relatedness) assumed significantly greater importance than security needs for enhancement-relevant experiences. Compared to Study 1, the Study 2 findings suggest that differences in prior traumatic experience qualified the effect of changes in event valence to enhancement-relevant events on relative need importance such that security: (1) *was not* significantly less important than most enhancement needs except for relatedness in the traumatized sample even though it (2) *was* significantly less important than most enhancement needs except for relatedness in the non-traumatized sample. Moreover, our findings suggest that interpersonal (relatedness) vs. individual (competence, autonomy, and self-esteem) enhancement needs can become more important in the context of prior trauma.<sup>4</sup>

#### General discussion

This work extends prior research by demonstrating the contextual influence of changes in event valence (enhancement-relevant vs. security-relevant) and prior trauma on the relative importance of security vs. enhancement needs. With respect to event valence, the results across studies show that the relative importance of enhancement vs. security needs shifted with changes in event valence as security vs. enhancement needs were significantly more important for recollections of security-relevant (distressing) events whereas enhancement vs. security needs became significantly more important when event valence shifted from recollections of security-relevant to enhancement-relevant (satisfying) event memories.

<sup>4</sup> Results showed adequate interrater reliability (Cohen’s  $\kappa > .65$ ) between two raters in coding the frequency of specific references made to 1 of the 5 critical needs (security, competence, relatedness, autonomy, and self-esteem) relevant to our predictions.

However, the findings across studies also suggest that pre-existing differences in traumatic experience of hurricane survivors vs. control participants qualified the effect of changes in event valence on relative need importance. Although a quantitative test of the interaction is inappropriate given that only a subset of potentially relevant demographic factors were controlled for, a qualitative analysis of the divergent pattern of results across samples suggests that pre-existing differences in the traumatic experience of hurricane survivors vs. control participants qualified the general tendency to shift significantly more importance to enhancement over security needs as event valence shifted from security-relevant to enhancement-relevant (satisfying) memories.

For security-relevant memories, the traumatized and non-traumatized samples did not differ on ratings of relative need importance as all participants rated security as significantly more important than all enhancement needs in defining distressing event experiences. However, when event valence shifted from security (distressing) to enhancement-relevant (satisfying) memories, differences did emerge between traumatized vs. non-traumatized participants in relative need importance such that security needs: (1) *were* rated as *significantly less* important than individual enhancement needs (3.8 vs. 4.1 for Competence, 4.2 for Autonomy, and 4.4 for Self-Esteem) in the non-traumatized (control) sample but (2) *were not* rated as significantly less important than all of the individual enhancement needs (3.3 vs. 3.5 for competence, 3.4 for autonomy, and 3.4 for self-esteem) in the traumatized sample of hurricane survivors. To summarize, these findings suggest that pre-existing differences in traumatic experiences may qualify the effect of changes in event valence on relative need importance. With the exception of relatedness, traumatized, unlike non-traumatized, participants did not rate enhancement needs as more important than security needs when event valence shifts to enhancement-relevant events that offer more viable opportunities to satisfy enhancement vs. security needs.

### Conceptual & practical implications

#### *The context(s) of relative need importance*

Before closing, we take a moment to pause and reflect on a few additional implications of this work. Although some scholars argue for the primacy of enhancement over security needs, recent evidence suggests that this tendency does not transcend the influence of certain contextual factors. The present work adds to this growing body of work to show that the relative importance of enhancement vs. security needs does not transcend but, instead, depends on contextual shifts in event valence and prior traumatic

experience. At a basic level, the present findings suggest that the relatively greater importance of enhancement over security needs does not extend beyond enhancement-relevant experiences.

In fact, across both studies, the distribution of relative need importance actually reversed when event valence shifted to security-relevant experiences such that significantly greater importance was assigned to security over enhancement needs. In addition, though, the results across studies suggest that the presence (vs. absence) of prior traumatic experience may also moderate the effect of changes in event valence on relative need importance. Consistent with past work, our findings show that prior trauma can ultimately inhibit the normal shift in importance to most enhancement needs except relatedness when event valence shifts to enhancement-relevant events by creating a chronic negativity bias in trauma survivors that focuses primarily on threat cues to the neglect of opportunity cues that define enhancement-relevant events. Of noteworthy importance, prior work has generalized the enhanced negativity bias over numerous specific traumas (Brewin et al. 1996a, b; McNally et al. 1990; Thrasher et al. 1994). Our work adds to this work by showing an interactive effect between the specific hurricane trauma and event valence that extends from enhancing negativity bias to, ultimately, enhancing the importance of security vs. enhancement needs. Just as that prior work generalized the enhanced negativity bias over a range of specific traumas, we assume that our effects should also generalize from hurricanes to other traumas. Of course, this claim awaits future research.

Nevertheless, this work adds to prior work that has underscored the need for context-sensitive therapeutic approaches to account for the contextual influence of current situational experiences (event valence) and prior patient history (prior trauma) in shaping the relative importance of different needs. Some work has even shown that well-being declines when people do not adjust to contextual shifts by continuing to pursue individual enhancement needs that are not supported by new situational or life contexts (Kasser 1996). Although purely speculative, we draw from this work to propose that clinical approaches based on unqualified scientific claims that all people focus on enhancement over security needs may actually amplify (vs. alleviate) distress in people facing security-relevant experiences within the broader context of prior trauma. The present findings suggest that an optimal therapeutic approach should recognize that people with prior traumatic experience who are currently experiencing security-relevant vs. enhancement-relevant events may have difficulty focusing on the pursuit of enhancement needs given the relatively greater salience of security concerns that define their current situational and prior life

contexts. Of course, beyond noting the independent effects on the relative importance of security vs. enhancement needs, these findings also suggest that prior trauma may interact with shifts in event valence from security to enhancement-relevant experiences in shaping the relative importance of specific enhancement needs. Across studies, the interpersonal vs. individual enhancement needs was significantly more important for enhancement-relevant events among traumatized vs. non-traumatized individuals.

Past work certainly supports the claim that threat and trauma increase the importance of relatedness needs for mental health and thriving (Baumeister and Leary 1995). The satisfaction of relatedness needs has unique benefits for well-being in times of trauma independent of any benefits associated with the satisfaction of competence or esteem needs (Williams et al. 1998). Some theorists have even suggested that the satisfaction of relatedness needs may actually be a precondition to the satisfaction of individual enhancement needs within unstable environments (Baumeister and Leary 1995) given that individual enhancement needs (e.g., competence) cannot be satisfied outside stable and meaningful relationships (Markus et al. 1990; Williams et al. 1998). Consistent with this logic, these results suggest that therapists should also consider that prior traumatic experience may motivate people to first pursue the restoration of *interpersonal* enhancement need of relatedness within stable and meaningful relational networks prior to pursuing the restoration of *individual* enhancement needs (e.g., autonomy, competence, and esteem) within those relational communities (family, neighborhood, community). To summarize, the present findings introduce two contextual factors that qualify past claims that the satisfaction of enhancement and, in particular, individual enhancement needs represent the most important quality indices of mental and behavioral experiences. These are only a few notable conceptual and practical implications of the present findings to shape future theory, research, and practice on the link between relative need importance and well-being.

#### *Limitations and future directions*

Although some measures (e.g., random assignment) were used in both studies to control for extraneous factors, limitations remain that qualify definitive claims that prior trauma uniquely accounts for the observed differences between samples. First, we controlled for only a subset of potentially relevant extraneous factors. For example, although the restriction of our college sample to lower division students (1–2 years college) enabled the *inference* the average education level in this sample and the

hurricane sample (high school education) was roughly equivalent, we still could not statistically control for the potential influence of education as we only measured it in the hurricane sample. Also, other relevant variables (e.g., age, religious affiliation) were not measured in either study. So, while trauma seems likely to account for most of the variance across samples, we cannot rule out the possibility that such unmeasured factors could account for at least a portion of the observed variance between the hurricane and college samples. Second, there are also basic limitations of the self-report methodology we used for certain demographic variables. For instance, some work suggests that income self-reports are vulnerable to different social desirability biases across different cultural contexts as higher reports of personal wealth/status are more desired in poorer nations whereas lower reports are more desired in wealthier nations (Oishi et al. 1999). Like those living in hardship in poor nations, hurricane survivors may have inflated income reports to present an image of personal wealth prior to their current life hardship. The income item was also vague as it never specified if personal income should include supporting family income. A spurious equivalence across samples in income may have arisen if students excluded supporting parent income from personal income. Ultimately, these and other response biases can be ruled out in future work by using objective records to account for critical demographic factors.

#### **Conclusion**

These findings support the claim that certain contextual variables can moderate the relative importance assigned to psychological needs. Both studies reveal the importance of event valence and prior trauma in moderating the relative importance assigned between and within the broader categories of enhancement and security needs. In this sense, the present work adds to the growing literature regarding what people need most and when their needs arise.

**Acknowledgments** The contents are solely the responsibility of the authors and do not necessarily represent the official views of the National Institute of Mental Health. We would like to thank Joann Benigno as well as Johnmarshall Reeve, and two anonymous reviewers for their helpful feedback on earlier versions of this manuscript.

#### **Appendix**

See Table 6.

**Table 6** Instructions for recall exercise

Now, we ask you to consider the past month of your life.\* Think back to important experiences during this period of time. What we want you to do is to bring to mind the single most personally (satisfying/distressing) event that you experienced over the past (month or week). We are being vague about the definition of (“satisfying event”/“distressing event”) on purpose, because we want you to use your own definition. Think of (“satisfying”/“distressing”) in whatever way makes sense to you. Take a couple of minutes to be sure to come up with a very impactful experience.

\* The phrase “since the hurricane” followed the word “life” at the end of this first sentence in the hurricane sample

## References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: American Psychiatric Association.
- Amir, N., McNally, R., & Wiegartz, A. (1996). Implicit memory bias for threat in posttraumatic stress disorder. *Cognitive Therapy and Research*, 20(6), 625–663.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497–529.
- Bowlby, J. (1969). *Attachment (Attachment and loss, Vol. 1)*. New York: Basic Books.
- Bowlby, J. (1973). *Separation: Anxiety and anger (Attachment and loss, Vol. 2)*. New York: Basic Books.
- Brewin, C. R., Christodoulides, J., & Hutchinson, G. (1996a). Intrusive thoughts and intrusive memories in a non-clinical sample. *Cognition and Emotion*, 10, 107–112.
- Brewin, C., Dalgleish, T., & Joseph, S. (1996b). A dual representation theory of post-traumatic stress disorder. *Psychological Review*, 103, 670–686.
- Carroll, P. J., Wichman, A. L., & Arkin, R. M. (2006). Security in the aftermath of 9–11. *Basic and Applied Social Psychology*, 28(4), 289–290.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality*, 62, 119–142.
- Hart, J., Shaver, P. R., & Goldenberg, J. L. (2005). Attachment, Self-esteem, worldviews, and terror management: Evidence for a tripartite security system. *Journal of Personality and Social Psychology*, 88(6), 999–1013.
- Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, 52, 1280–1300.
- Kasser, T. (1996). Aspirations and well-being in a prison setting. *Journal of Applied Social Psychology*, 26, 1367–1377.
- Kasser, T. (2002). Sketches for a self-determination theory of values. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 123–140). Rochester, NY: University of Rochester Press.
- Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Well-being correlates of intrinsic and extrinsic goals. *Personality and Social Psychology*, 22, 281–288.
- Kasser, T., & Sheldon, K. (2008). Psychological threat and extrinsic goal striving. *Motivation and Emotion*, 32, 37–45.
- Markus, H., Cross, S. E., & Wurf, E. (1990). The role of the self-system in competence. In R. J. Sternberg & J. Kolligan Jr. (Eds.), *Competence considered* (pp. 205–226). New Haven, CT: Yale University Press.
- Maslow, A. (1954). *Motivation and personality*. New York: Harper & Row.
- McNally, R. J., Luedke, D. L., Beysner, J. K., Peterson, R. A., Bohm, K., & Lips, O. J. (1987). Sensitivity to stress-relevant stimuli in post-traumatic stress disorder. *Journal of Anxiety Disorders*, 1, 105–116.
- McNally, R. J., Aspi, S. P., Reimann, B. C., & Zeitlin, S. B. (1990). Selective processing of threat cues in posttraumatic stress disorder. *Journal of Abnormal Psychology*, 99(4), 398–402.
- Oishi, S., Diener, E., Suh, E., & Lucas, R. E. (1999). Cross-cultural variations in predictors of life satisfaction: Perspectives from needs and values. *Personality and Social Psychology Bulletin*, 25, 980–990.
- Ryan, R. M. (1995). Psychology needs and the facilitation of integrative processes. *Journal of Personality*, 63, 397–427.
- Ryan, R., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68–78.
- Sheldon, K. M., Ryan, R. M., & Reis, H. (1996). What makes for a good day? Competence and autonomy in the day, and in the person. *Personality and Social Psychology Bulletin*, 22, 1270–1279.
- Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology*, 80, 325–339.
- Thrasher, S. M., Dalgleish, T., & Yule, W. (1994). Information processing in post-traumatic stress disorder. *Behavior Research & Therapy*, 32, 247–254.
- Vasey, M. W., Daleiden, E. L., Williams, L. L., & Brown, L. M. (1995). Biased attention in childhood anxiety disorders: A preliminary study. *Journal of Abnormal Child Psychology*, 23, 267–279.
- Vasey, M. W., El-Hag, N., & Daleiden, E. L. (1996). Anxiety and the processing of emotionally threatening stimuli: Distinctive patterns of selective attention among high- and low-test-anxious children. *Child Development*, 67, 1173–1185.
- Wahba, M. A., & Bridwell, L. G. (1976). Maslow reconsidered: A review of research on the need hierarchy theory. *Organizational Behavior and Human Performance*, 15, 212–240.
- Watson, D., Clark, L., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070.
- Williams, K. D., Shore, W. J., & Grahe, J. E. (1998). The silent treatment: Perceptions of its behaviors and associated feelings. *Group Processes & Intergroup Relations*, 1(2), 117–141.