

On Boredom: Lack of Challenge and Meaning as Distinct Boredom Experiences

Wijnand A. P. van Tilburg & Eric R. Igou

University of Limerick, Ireland

Author Note

Wijnand A. P. van Tilburg, Department of Psychology, University of Limerick, Castletroy, Republic of Ireland; Eric R. Igou, Department of Psychology, University of Limerick, Castletroy, Republic of Ireland.

This research was in part funded by a PhD scholarship grant from the Irish Research Council for the Social Sciences and Humanities (IRCHSS). We want to thank Marcel Zeelenberg for his encouraging remarks on our undertaking, the members of the Social Cognition and Decision Making Lab for their constructive comments on our research, and Annemieke J. M. van den Tol for her assistance in data collection. In addition, we would also like to thank Timothy D. Ritchie for his feedback on an earlier version of the manuscript.

Correspondence concerning this article should be addressed to Wijnand A. P. van Tilburg, Department of Psychology, Computer Science Building, University of Limerick; Castletroy, Republic of Ireland, Phone: +353 61 234692, Email: Wijnand.vanTilburg@ul.ie

Abstract

Boredom is a common experience that affects people on multiple levels, including their thoughts, feelings, motivations, and actions. Not much research, however, has examined what makes the experience of boredom distinct from other affective experiences. Based on earlier research on boredom and our meaning-regulation framework, we conducted a series of four studies that demonstrate the distinct experiential content of boredom. More than other negative affective experiences (sadness, anger, and frustration), boredom makes people feel unchallenged while they think that the situation and their actions are meaningless (Study 1). The distinct experiential content of boredom is associated with boredom proneness (Study 2) and with state boredom experiences (Study 3). In addition, the distinct experiential content of boredom is affected by contextual features (Study 4). This series of studies provides a systematic understanding of what people feel, think, and want to do when bored, distinctive from other negative experiences.

Keywords: boredom, challenge, meaning, emotion

On Boredom: Lack of Challenge and Meaning as Distinct Boredom Experiences

It is Friday afternoon. You just completed your manuscript, you graded all homework assignments, you prepared your upcoming lectures, your research assistants are trained well enough to enter data without your advice, your friends have adapted to your academic career and are now able to enjoy themselves without your presence and – to make matters even worse – in the coming week there will be a public holiday with only trash on TV. Much to your surprise, you do not feel the long anticipated satisfaction of having nothing to do, instead you feel an emptiness, you don't feel like standing up nor like sitting down; you are utterly bored. Fortunately, many people are able to understand your pain and may sympathize with you because boredom is a common emotion (Farmer & Sundberg, 1986), with some research estimating that between 18% and 50% of the population often feels bored (Klapp, 1986; see also Eastwood, Cavaliere, Fahlman, & Eastwood, 2007).

Given the prevalence of boredom, it is surprising that research on the experience of boredom has only started to gain attention within psychology during the last decades. Most boredom research has focused only on correlates of boredom *proneness* (e.g., Dahlen, Martin, Ragan, & Kuhlman, 2004; Farmer & Sundberg, 1986). Past research identified correlations between boredom proneness and phenomena such as job dissatisfaction (e.g., Kass, Vadanovich, & Callender, 2001), anxiety (Gordon, Wilkinson, McGrown, & Jovanoska, 1997), pathological gambling (e.g., Blaszczynski, McConaghy, & Frankova, 1990), aggression (e.g., Rupp & Vadanovich, 1997), and eating disorders (e.g., Stickney & Miltenberger, 1999). However, there is no clarity with respect to affective, cognitive, and motivational signature of state boredom, and in particular how this is *distinct* (i.e. different) from other affective states.

What do we know about the experience of boredom? First of all, we roughly know what bored people look like. Wallbott (1998) investigated the bodily expression of actors

imposing several emotional states – including boredom – and found that actors who act bored typically hold a collapsed upper body, lean their heads backwards, and engage in few bodily movements. Second, we know how bored people interpret their environment. In a classical study on cognitive appraisals of emotions, Smith and Ellsworth (1985; see also Leary, Rogers, Canfield, & Coe, 1986) found that boredom is a negative experience in which people make appraisals of low effort and little attention; bored people feel that they have little on their minds and they have a clear idea of what is going on.

Boredom can motivate an array of behaviors. Some of these behaviors are immediately aimed at reducing how boring an activity or situation is, for example by seeking challenge or stimulation (e.g., Csikszentmihalyi, 2000; Dahlen et al., 2004; Farmer & Sundberg, 1986; Harris & Segal, 1985; Vodanovich & Kass, 1990), interest or engagement (e.g., Fisher, 1998; Kanevsky & Keighley, 2003; Sansone, Weir, Harpster, & Morgan, 1992; Silvia, 2006), or fun (e.g., Smith, Wagaman, & Handley, 2009). Intriguingly, however, some motivated behaviors following from boredom surpass the activity or situation at hand. People who are bored seem motivated to engage in acts that provide them with a sense of meaning or purpose (e.g., Barbalet, 1999; Bargdill, 2000; Fahlman, Mercer, Gaskovski, Eastwood, & Eastwood, 2009). Building on this research, we argue that the experience of boredom makes one's activities seem meaningless, motivating people to create or re-establish a sense of meaningfulness. That is, escaping or counteracting the influence of boredom is an escape from the very unpleasant impression that one's activities are meaningless (e.g., Van Tilburg & Igou, 2011a, 2011b; see also Fromm, 1973). In order to achieve this goal, boredom does not motivate people to engage in one particular behavior; it motivates people to engage in any activity that seems meaningful to them. This hypothesis is consistent with recent approaches people's meaning-regulation strategies. For example, Heine, Proulx, and Vohs (2006) pose that people's overarching goal is to strive for a sense of meaning via satisfying particular

needs (e.g., symbolic immortality). If these needs are threatened (e.g., due to mortality salience), then people protect or re-establish a sense of meaningfulness. Psychological responses such as defending cultural worldviews (e.g., in-group favoritism and out-group derogation) or pursuing social connectedness (e.g., seeking relationships) can be used relatively interchangeably in order to maintain a sense of personal meaningfulness. In this regard, we understand boredom as a threat to the perception of meaningfulness, motivating bored people to eliminate or counteract this influence by re-establishing a sense of meaningfulness.

Crucially, we argue that boredom is an emotion ‘in its own right’; that is, boredom has a set of features that is not explainable by any other emotion. More specifically, ‘feeling unchallenged’ and perceiving one’s ‘activities as meaningless’ is central to boredom, whereas other boredom correlates such as ‘unpleasantness’, ‘lack of interest’, or ‘disengagement’ may be shared with many other emotions such as sadness. In essence, we argue that the concepts of challenge and meaning explain the difference of boredom to other emotional states particularly well, and they indicate why boredom is important with regards to meaning-regulation.

One important benefit of identifying boredom’s *unique* experiential is that this provides a basis for predicting actions that are distinct from other affective states (e.g., Eastwood et al., 2007), that is, because it helps to understand which consequences are directly stemming from boredom rather than from other co-occurring affective states that may arise while people are engaged in boring activities (e.g., frustration, sadness, or anger). Past research on state boredom has typically looked at boredom without specifying other affective states that may co-occur or overlap with boredom. In fact, in their pioneering boredom research, Farmer and Sundberg (1986) already highlighted the importance of examining what makes boredom different from other affective states, yet such crucial systematic empirical

work has still not been conducted (see also Vodanovich, 2003). Our research was therefore designed to examine the specific experience of boredom and how it is different from other emotional experiences; in order to fulfill this aim, we systematically analyzed several boredom experiences and investigated their relationship to chronic boredom proneness and temporary state boredom. Importantly, we focused in the current research especially on the *lack of challenge and meaning* associated with boredom because these two factors can promote responses that may hold implications for future behavior, even after a specific boring activity has finished (e.g., Csikszentmihalyi, 2000). Moreover, research has documented a vast amount of consequences of meaning threats such as mortality salience, uncertainty, low self-esteem, or a lack of social affiliation (e.g., Heine et al., 2006). Conceptualizing boredom as another type of meaning threat offers great potential for a fuller understanding of boredom and for meaning-regulation processes in general.

Overview

As the crucial starting point of our approach, we analyzed in Study 1 how boredom relates to five common experiential content domains: feelings, thoughts, action tendencies, actions, and motivational goals¹ (see Roseman, Wiest, & Swartz, 1994) in comparison to how other emotions related to this experiential content. This ‘experiential content’ would reflect the *state* of boredom, but more precisely it would reflect a particular state, one that makes boredom distinct from other affective states. The experiential content of boredom was then validated in Study 2 by correlating it to an often used boredom measure, the boredom proneness scale (Farmer & Sundberg, 1986). To investigate the validity of boredom’s experiential content in relation to the momentary experience of boredom, we correlated the distinct experiential content (i.e. distinct from other affective states) to participants’ state experience of boredom in Study 3. Finally, in Study 4 we tested whether boredom involves the distinct experiential experiences by manipulating state boredom. In addition, we tested

whether the interpretation of the current situation (causal appraisal) would explain the effects of the boredom induction on its distinct experiential content.

Study 1: Exploring Boredom's Distinct Experiential Content

What do people experience when they are bored? And how does this experience differ from other negative affective states? We followed the procedure proposed by Roseman and colleagues (1994; see also Frijda, Kuipers, & Ter Schure, 1989) to identify the experiential content of boredom as this approach has proven to be a successful way to assess the feelings, thoughts, action tendencies, actions, and motivational goals that are typical for specific emotions. In addition, the method proposed by Roseman and colleagues seemed valuable as their method was particularly designed to investigate the *distinct* experiential content of affective states. This approach has proven to be valuable in examining the distinctive elements of emotions (see also Van de Ven, Zeelenberg, & Pieters, 2009) and the relatively broad focus is also consistent with the important early work on boredom by Leary and colleagues (1986), who stress that the experience of boredom involves an array of “situational antecedents, psychological correlates, phenomenological concomitants, and behavioral consequences” (p. 968).

We explored participants' past experiences of boredom and compared them to the past experiences of sadness, anger, and frustration. Participants were asked to indicate to what extent particular feelings, thoughts, action tendencies, actions and motivational goals would be descriptive of how they felt during their recalled experience. As critical comparative affective states, we included sadness, anger, and frustration. Sadness was selected because it resembles a more general and prototypical state of negative affect. Moreover, early boredom research emphasized the potential difference between boredom and sadness (Farmer & Sundberg, 1986), yet these concepts have not yet been directly compared (see Vodanovich, 2003), even though boredom proneness is correlated with negative affect (e.g., Vodanovich,

Verner, & Gilbride, 1991). We compared boredom to anger because both states have been found to correlate in the past (e.g., Rupp & Vodanovich, 1997); and assuming that a number of ‘boring’ tasks hinder the achievement of particular goals (e.g., having fun rather than having to copy letters; Smith et al., 2009), we chose to also compare boredom with frustration. Importantly, we predicted that boredom differs from sadness, anger, and frustration. In addition, we examined which contexts participants typically recalled in order to gain more insights into the situational characteristics of their boredom experiences.

Method

Participants and design. One hundred and six undergraduate students participated in this study and were randomly assigned to either one of the four emotion conditions (Emotion: Boredom vs. Sadness vs. Anger vs. Frustration) of a between factorial design. Two participants were excluded based on the outlier criteria proposed by Tabachnick and Fidell (2007), resulting in an effective sample size of 104 participants (60 females, 44 males; $M_{\text{age}} = 20.53$, $SD = 3.08$).

Procedure and materials. Students were approached on campus and asked if they were willing to participate in a short paper-and-pencil study on emotions. Upon agreement, participants filled out the consent forms and then gave us demographic information (age, sex). Participants then recalled and wrote down an experience of feeling bored, sad, angry, or frustrated. Specifically, they were asked to “describe what you experienced at that moment in such a way that another person would be able to easily imagine how you felt at that moment” in order to facilitate the detailed recollection of the experience. Next, they rated the experiential content of the emotion: their feelings, thoughts, action tendencies, actions, and motivational goals. Following Roseman and colleagues (1994), we included two items per experiential content domain for each emotion. The items had the following structure: “When you were feeling [emotion], how much did the feeling make you [experiential content]?”

Items relating to sadness, anger, and frustration were taken from Roseman and colleagues² and we generated items for boredom based on literature. Specifically, research suggests that boredom relates to a lack of challenge (e.g., Csikszentmihalyi, 2000), a lack of purpose or meaning (e.g., Barbalet, 1999; Fahlman et al., 2009), and a subsequent desire for changing aspects of the situation or to pursue challenge and meaning in subsequent behavior (e.g., Csikszentmihalyi, 2000; Smith et al., 2009). We focused especially on these domains of the proposed boredom experience because they seemed to be central to the boredom experience and may have a particularly pronounced impact on subsequent behavior (e.g., Sansone, 1992; Rupp & Vodanovich, 1997). Participants rated their agreement to all of the items on five-point interval scales ranging from 1 (*not at all*) to 5 (*very much*).

As reflected in Table 1, the boredom *feeling* items read “When you were feeling bored, how much did the feeling make you feel restless and unchallenged at the same time?” (Item 1) and “When you were feeling bored, how much did the feeling make you feel that you did not know what to do with your time?” (Item 2). The *thought* items read “When you were feeling bored, how much did the feeling make you unable to stop thinking about things you would rather do?” (Item 3) and “When you were feeling bored, how much did the feeling make you think that the situation served no important purpose?” (Item 4). The *action tendency* items read “When you were feeling bored, how much did the feeling make you feel like doing something completely different?” (Item 5) and “When you were feeling bored, how much did the feeling make you feel like doing something purposeful?” (Item 6). The *action* items read “When you were feeling bored, how much did the feeling make you change to more exiting behaviors?” (Item 7) and “When you were feeling bored, how much did the feeling make you turn to a more meaningful activity?” (Item 8). Finally, the *emotivational goal* items read “When you were feeling bored, how much did the feeling make you want to do something more meaningful?” (Item 9) and “When you were feeling bored, how much did

the feeling make you want to be challenged?” (Item 10). In the other emotion conditions, the items did not refer to boredom but to the other emotion in question (e.g., “When you were feeling sad ...”) and the ended with the experiential contents (see Roseman et al., 1994).

Higher ratings indicate that an emotion has the particular experiential quality.

To summarize, participants rated all forty experiential content items (always two items relating to feelings, thoughts, action tendencies, actions, and emotivational goals) that seem typical for each of the four emotions, and this was done in all four emotion conditions. Afterwards, participants were shown a funny Calvin and Hobbes cartoon to enlighten their moods, and then they were thanked, debriefed, and rewarded for their participation.

Results^{3,4}

Results on individual items. We predicted that typical boredom experiences would be rated higher when boredom was recalled then when another emotion was recalled *for each* of the ten boredom items. For that purpose, we examined participants’ scores on these items across the conditions. First, we tested whether there were significant differences across all conditions using one-way analyses of variance (ANOVA) with Emotion as independent variable and each item relating to the experiential content of boredom as dependent variable. Next, we conducted planned comparisons testing the prediction that participants in the boredom condition would yield higher average ratings on each of the items relating to boredom’s experiential content compared to sadness, anger, and frustration. We only considered an item to measure the *distinctive* experience of boredom if it satisfied two important criteria: (1) the ANOVA revealed significant differences across the emotion conditions, and (2) the boredom item was rated significantly higher in the boredom condition compared to *each* of the other emotion conditions. We implemented this conservative test in order to very precisely identify the distinct emotional content of boredom experiences.⁵ As reflected in Table 1 and 2, the results of these analyses indicated that at least one item in all

the five experiential content domains satisfied the criteria for being distinctive of boredom, totaling seven out of the ten items. Specifically, these analyses indicated that boredom involves feeling restless and unchallenged at the same time (Item 1) while thinking that the situation serves no purpose (Item 4). One wants to engage in behavior that is different and purposeful (Items 5 & 6) and one is motivated to be challenged and to engage in something meaningful (Items 8, 9, & 10).

Results on aggregate of all items. When the composite measure of all ten boredom items ($\alpha = .79$) was entered into a one-way ANOVA with Emotion as independent variable, differences between the conditions were highly significant, $F(3, 100) = 23.44$, $p < .001$, $\eta^2 = .41$. As reflected in Table 3, participants' scores were higher in the boredom condition ($M = 3.90$, $SD = 0.44$) compared to the sadness condition ($M = 2.88$, $SD = 0.74$), $t(100) = 6.30$, $p < .001$, $d = 1.26$, compared to the anger condition ($M = 2.82$, $SD = 0.63$), $t(100) = 6.65$, $p < .001$, $d = 1.33$, and compared to the frustration condition ($M = 2.77$, $SD = 0.70$), $t(100) = 7.22$, $p < .001$, $d = 1.44$. The sadness, anger, and frustration conditions did not differ significantly from each other (all $ps > .53$). Overall, these results indicate that the ten items relating to boredom's experiential content were useful to differentiate between the experience of boredom compared to experiences of sadness, anger, and frustration.

Results on aggregate of most distinct items. Of all the proposed ten distinctive items, seven satisfied the two conservative distinctiveness criteria specified above and these seven covered all five experiential content domains (see Table 1, items indicated with *). We performed a similar analysis on the basis of our conservative criterion for distinctiveness. That is, we used the items where participants in the boredom condition gave significantly higher ratings to the experiential content in question than in any other emotion condition. We averaged these seven items into a single score of boredom's distinctive experiential content ($\alpha = .80$). A one-way ANOVA with the aggregated experiential content as dependent

variable, and Emotion as independent variable revealed significant differences, $F(3, 100) = 27.85, p < .001, \eta^2 = .46$. As can be observed in Table 3, in the boredom condition participants scored higher ($M = 4.14, SD = 0.45$) compared to the sadness condition ($M = 2.86, SD = 0.86$), $t(100) = 6.64, p < .001, d = 1.33$, compared to the anger condition ($M = 2.65, SD = 0.72$), $t(100) = 7.76, p < .001, d = 1.55$, and compared to the frustration condition ($M = 2.75, SD = 0.71$), $t(100) = 7.54, p < .001, d = 1.51$. The sadness, anger, and frustration conditions, however, did not differ significantly from each other (all $ps > .28$). The findings regarding the seven aggregated boredom items thus reveal that boredom is clearly distinct from experiences such as sadness, anger, and frustration.

Boredom situations. In order to understand what *kind* of boredom experiences were recalled, we also examined the situational characteristics of the participants' descriptions. A first coder went through the boredom descriptions ($N = 28$) and generated situational categories. A second and third coder then independently categorized each description. There was a high consensus across the two coders (89%) and full agreement for the remainder was reached after the coders exchanged their views on the reasons for their categorizations. The most frequently described boredom experience related to educational settings ($N = 10$; e.g., attending a boring lecture), followed by situations in which participants were alone ($N = 5$; e.g., friends were away for the weekend), boredom experienced during leisure activities ($N = 3$; e.g., nothing of interest on TV), and being bored at work ($N = 2$; e.g., working in a shop with few customers). The remaining participants ($N = 8$) focused on boredom's affective character without providing details of the situational characteristics of their experiences.

Participants' ratings of the distinct experiential content items are quite high across all of these different categories (all $Ms \geq 3.95$), when compared to the sadness, anger, and frustration conditions (all $Ms \leq 2.86$).⁶ Moreover, the rated distinct experiential content did not differ much between the categories: Participants' ratings of the aggregated distinct

boredom items were highest for work boredom ($M = 4.43$, $SD = 0.20$, $N = 2$), followed by feeling bored while being alone, ($M = 4.26$, $SD = 0.34$, $N = 5$), boredom in educational settings ($M = 4.10$, $SD = 0.56$, $N = 10$), and leisure boredom ($M = 3.95$, $SD = 0.08$, $N = 3$). For participants who gave descriptions that did not offer information regarding the specific situation the scores fell more or less in the middle ($M = 4.10$, $SD = 0.50$, $N = 8$). Overall, boredom situation thus ranged from educational, work, and leisure settings, to being alone; each of these situation seemed to involve relatively similar scores on boredom's distinct experiential content.

Discussion

The experiential content of boredom was investigated with respect to feelings, thoughts, action tendencies, actions, and emotivational goals that differentiate boredom from sadness, anger, and frustration. Using a conservative criterion regarding the distinctiveness of experienced content of one emotion to other emotions, we found that seven items clearly captured a distinct experiential content of boredom; boredom involves feeling restless and unchallenged at the same time while thinking that the situation serves no purpose. One wants to engage in behavior that is different and purposeful, and this is accompanied by turning to activities that are considered to be more meaningful. These findings lend support to our general hypothesis that bored people feel unchallenged, that they think the situation and their activities are meaningless, motivating them to engage in more meaningful activities. Importantly, this particular configuration of experiences *distinguishes* boredom from the other negative affective states such as sadness, anger, and frustration: It not merely confirms that these elements are part of the state boredom experience, but it suggests that they are not merely reflecting co-occurring experiences of other negative affective states.

Study 1 was a first step in the identification of the experiential content of boredom. Participants recalled boredom experiences and experiences of other emotions and then

reported their characteristics. Boredom situations in the current study involved educational, work, leisure settings, and situations in which one was alone. In additional studies, we tested whether the identified distinct experiential content of boredom is consistent with individual differences in boredom proneness (Study 2) and with the actual state experiences when people are bored, by measuring (Study 3) and manipulating (Study 4) state boredom.

Study 2: Experiential Content and Boredom Proneness

Is vulnerability for being bored associated with the typical configuration of boredom experiences? That is, do people who are prone to being bored more frequently experience what we identified as the distinct set of boredom experiences? We designed Study 2 in order to examine the validity of boredom's identified experiential content (Study 1) by relating it to the boredom proneness scale (Farmer & Sundberg, 1986) – a measure of people's *disposition* for being bored. The boredom proneness scale is regarded as a valid and reliable boredom proneness measure (Farmer & Sundberg, 1986) and has been shown to predict a wide variety of phenomena (e.g., anger, aggression, impulsiveness, sensation seeking, lack of and search for meaning in life; see Dahlen, et al., 2004; Rupp & Vodanovich, 1997; Van Tilburg & Igou, 2011a). On one level, a correlation between boredom proneness and boredom's distinct experiential content would mean that people prone to be bored more often have the distinct experience of boredom than people who are less prone to be bored. On another level, a correlation would suggest that the identified experiential content partially represents the boredom construct. Importantly, the existence of a correlation would confirm that the previously identified distinct experiential content of boredom is not merely restricted to *recalled* boring situation but also relates to another boredom indicator, in this case individual differences in the vulnerability of experiencing boredom.

Method

Participants and design. Thirty-five undergraduate students participated in a correlational paper & pencil study (21 females, 14 males; $M_{\text{age}} = 21.60$, $SD = 2.34$) in exchange for a candy bar.

Procedure and materials. Students were asked to participate in a short study on emotions and attitudes. Upon agreement, we provided participants with the informed consent form before asking them for demographic information (age, sex). To make the level of measurement similar to that of the boredom proneness scale, the seven distinct experiential content items (Study 1) were revised so that they would measure frequent experiences. Specifically, the items read “I often feel restless and unchallenged at the same time.”, “I often think that the situation serves no important purpose.”, “I often feel like doing something completely different.”, “I often feel like doing something more purposeful.”, “I often turn to a more meaningful activity.”, “I often want to do something more meaningful.”, and “I often want to be challenged.” Participants rated to what extent each of the items were descriptive of them on a five-point interval scale ranging from 1 (*never*) to 5 (*most of the time*). None of the items included an explicit reference to boredom. Next, participants worked on the boredom proneness scale (Farmer & Sundberg, 1986), which includes items such as “Most of the time I just sit around doing nothing”; “I am good at waiting patiently” (reversed), measured with five-point interval scale ranging from 1 (*never*) to 5 (*most of the time*). Afterwards, participants were thanked, rewarded, and debriefed.

Results and Discussion

Participants’ scores on the experiential content items were averaged ($\alpha = .79$) as were their scores on the boredom proneness scale after recoding reversed items ($\alpha = .82$). Next, we calculated the correlation between the two measures. As predicted, we obtained a significant positive correlation between the experiential content and the boredom proneness scale ($r =$

.48, $p < .01$), indicating that the distinct experiential content identified in Study 1 overlaps with boredom proneness. In other words, the correlation between the measured boredom proneness – a dispositional measure of boredom – and boredom’s distinct experiential content signals that people who become more easily bored more often have the distinct boredom experiences. Importantly, these results lend credibility to the assumption that this experiential content represents the boredom construct. This study used a dispositional indicator of boredom; in Study 3 we examined whether the distinct boredom experiences overlap with *state* boredom.

Study 3: Experiential Content and Measured State Boredom

The previous studies focused on recalled and dispositional boredom but did not directly show what bored people feel in the moment when they are bored. Do people *who are momentarily bored* have more of the distinct boredom experiences than people who are momentarily less bored? Based on the identified distinct experiential content of boredom in Study 1 we designed Study 3 to examine the validity of boredom’s identified experiential content by testing whether it relates to *actual state experiences* of boredom assessed at the end of a two-hour psychology tutorial. A correlation between the experiential content of boredom with the momentary experience of boredom would again validate the identified experiential content. In addition, the existence of a correlation would again confirm that the previously identified distinct experiential content of boredom is not merely restricted to recalled boring situations or dispositional boredom but also translates well to state experiences as a boredom indicator.

Method

Participants and design. Seventy-seven undergraduate students participated in a correlational paper & pencil study (54 females, 23 males; $M_{\text{age}} = 19.31$, $SD = 3.86$) in exchange for partial course credit.

Procedure and materials. Students engaged in this research as part of their course requirement and this study took place at the end of a first year two-hour psychology tutorial in which the topic of entering data and labeling variables was covered, which posed an ideal setting for examining state boredom. The data collection was situated in class rooms of between 20 and 30 students who all worked quietly and individually on the materials. After giving informed consent, participants were asked for demographic information. The seven items of our boredom experience measure (Study 1) were revised in such a way that they accounted for state experiences. Specifically, the items read “When you focus on your feelings at the moment, how much does the feeling make you feel restless and unchallenged at the same time?”, “When you focus on your feelings at the moment, how much does the feeling make you think that the situation served no important purpose?”, “When you focus on your feelings at the moment, how much does the feeling make you feel like doing something completely different?”, “When you focus on your feelings at the moment, how much does the feeling make you feel like doing something more purposeful?”, “When you focus on your feelings at the moment, how much does the feeling make you turn to a more meaningful activity?”, “When you focus on your feelings at the moment, how much does the feeling make you want to do something more meaningful?”, and “When you focus on your feelings at the moment, how much does the feeling make you want to be challenged?” Participants rated the extent to which they agreed to each of the items on five-point interval scales ranging from 1 (*not at all*) to 5 (*very much*). In addition, participants indicated the extent to which they experienced state boredom by rating the item “When you focus on your feelings in this moment, how much do you feel bored?” on a five-point interval scale ranging from 1 (*not at all*) to 5 (*very much*). Afterwards, participants were thanked, rewarded, and debriefed.

Results and Discussion

Participants' scores on the experiential content items were averaged ($\alpha = .78$) and correlated with the state boredom ratings. A significant positive correlation was obtained ($r = .58, p < .001$), indicating that the more the participants felt bored at the time of the study, the more they agreed with the experiential content that was found to be most distinctive for boredom. Importantly, this study confirms that the more people experience boredom in a particular moment the more their experiences are in line with the distinct experiential content reported in Study 1. In Study 4, we tested whether the experiential content of boredom would also be observed when boredom was manipulated and whether the causal appraisal of the situation as 'boring' would explain the effects of our manipulation on the distinct boredom experiences.

Study 4: Experiential Content, Manipulated State Boredom, and the Interpretation of the Situation

Study 4 was designed to examine two questions. We first of all tested whether state boredom causes the distinct boredom experience. Extending the investigation of the distinct experiential content of boredom from yet another perspective would further confirm that the distinct experiential content represents typical boredom experiences. To understand an emotion requires an understanding of people's interpretation of the self and the situation (e.g., Frijda, 1988, 2007; Lazarus & Smith, 1988; Schachter & Singer, 1962; Scherer, 1997). The *experiential content* of boredom reflects for the most part the self-related *descriptive appraisal* of this emotion. That is, how people experience the situation and how they plan to respond. However, appraisals are also important to understand how the interpretation of the situation causes the emotion, that is, the *causal appraisals* or appraisals as antecedents of emotions (e.g., Frijda, 2007; Scherer, 1997). For *state* boredom, the situation is of central

importance. We therefore also tested whether the interpretation of the situation is accountable for the resulting feelings, thoughts, goals, and actions.

Method

We adopted the notion that the distinct boredom experiences (feelings, thoughts, motivational goals, action tendencies, actions) may in part result from people's interpretation of the situation as boring. Consequently, we tested whether the effects of the boredom manipulation on boredom experiences would be mediated by the extent to which the situation was perceived as boring. We also controlled for the states of frustration, anger, and sadness to test whether the boredom manipulation had a distinct effect on state boredom compared to these other emotional states.

Participants and design. Thirty-six undergraduate students participated in a short study and were assigned to either one of the conditions (Boredom: High vs. Low) of a between factorial design in exchange for a candy bar. One participant was excluded based on the outlier criteria proposed by Tabachnick and Fidell (2007), resulting in an effective sample size of thirty-five participants (22 females, 13 males; $M_{\text{age}} = 21.66$, $SD = 3.58$).⁷

Procedure and materials. Students were asked to participate in exchange for a candy bar. Upon agreement, participants gave their informed consent and reported demographic information. Boredom was manipulated by having participants engage in the repetitive task of copying either only 2 (Low Boredom) versus 10 (High Boredom) references taken from an October 2009 Wikipedia entry on concrete (e.g., "Kosmatka, S.H.; Panarese, W.C. (1988). *Design and control of concrete mixtures*. Skokie, IL"). After copying either 2 or 10 references, participants were asked for their causal appraisal of the situation "To what extent did the task you just completed make you feel bored?" on a seven-point interval scale ranging from 1 (*not at all*) to 7 (*very much*). Afterwards, they worked on the seven distinct boredom experience items (Study 1). Specifically, the items read "To what extent do you feel

restless and unchallenged at the same time?”, “To what extent do you think that the situation served no important purpose?”, “To what extent do you feel like doing something completely different?”, “To what extent do you feel like doing something more purposeful?”, “To what extent do you wish to turn to a more meaningful activity?”, “To what extent do you want to do something more meaningful?”, and “To what extent do you want to be challenged?”

Participants rated their agreement on five-point interval scales ranging from 1 (*not at all*) to 5 (*very much*). Next, we had participants rate the extent to which they felt bored, sad, angry, and frustrated on four similar five-point interval scales in order to measure their emotional states using four items (“To what extent do you feel bored?”, “To what extent do you feel sad?”, “To what extent do you feel angry?”, “To what extent do you feel frustrated?”).

Afterwards, participants were thanked, rewarded, and debriefed.

Results

Interpretation of the Situation. The item measuring whether participants perceived the reference copying task as boring was subjected as a dependent variable to a one-way ANOVA with the boredom manipulation as independent variable. As reflected in Table 4, this analysis indicated that in the high boredom condition participants thought more strongly that the task made them feel bored ($M = 4.83$, $SD = 1.95$) than participants in the low boredom condition ($M = 3.00$, $SD = 2.00$), $F(1, 33) = 7.55$, $p = .01$, $\eta^2 = .19$.

Distinctive emotional state. The items measuring state boredom, sadness, frustration, and anger were each entered as dependent variable into four one-way ANOVAs with the boredom manipulation as independent variable. As reflected in Table 4, these analyses revealed that participants felt significantly more bored after copying 10 references ($M = 3.61$, $SD = 1.42$) versus 2 references ($M = 2.65$, $SD = 1.17$), $F(1, 33) = 4.78$, $p = .04$, $\eta^2 = .13$, indicating the effectiveness of our manipulation. No reliable differences, however, were

found on feeling sad ($M = 2.00, SD = 1.28$ vs. $M = 1.44, SD = 0.71$), $F(1, 33) = 2.59, p = .12$, $\eta^2 = .07$, feeling angry ($F < 1$), or feeling frustrated ($F < 1$).⁸

Specific boredom experiences. The participants' scores on the experiential content items were averaged ($\alpha = .87$) and were subjected as dependent variable to a one-way ANOVA with the boredom manipulation as independent variable. As reflected in Table 4, this analysis indicated that in the high boredom condition participants agreed more to the experiential content items ($M = 4.05, SD = 0.90$) than in the low boredom condition ($M = 3.30, SD = 0.87$), $F(1, 33) = 6.21, p = .02, \eta^2 = .16$.

Interpretation of situation as mediator. The interpretation of causality to the situation (i.e., the task) has implications for the specific boredom experiences, that is, how people feel, what they think, and what they plan to do. Therefore, the appraisal of the task as being boring was expected to mediate the effect of boredom (high vs. low) on the experiential content scores. An analysis of statistical mediation was performed following the procedure of Preacher and Hayes (2008). As reflected in Figure 1a, this analysis indicated that participants scored higher on boredom's experiential content in the high than in the low boredom condition, $B = 0.75, S_e = 0.30, \beta = 0.40, t(32) = 2.49, p = .02$,⁹ and the causal appraisal was more pronounced in the high versus the low boredom condition, $B = 1.83, S_e = 0.67, \beta = 0.43, t(32) = 2.75, p = .01$. Moreover, the non-mediated effect of the boredom manipulation on the experiential content was not significant ($t < 1$) while the appraisal was significantly associated with the experiential content, $B = 0.26, \beta = 0.60, S_e = 0.06, t(32) = 4.14, p < .001$. The mediated effect, estimated using 5,000 accelerated and bias-corrected bootstraps as recommended by Hayes (2009), confirmed the existence of a significantly mediated path, $0.11 < B_{95} < 1.04, S_e = 0.23, 0.26 < \beta < 0.56$.

The finding that our manipulation only significantly affected state boredom and not the other negative emotional states suggests that the effect of our manipulation on the

experiential content of boredom was unlikely to be associated with sadness, anger, frustration, but it was likely to be associated with boredom. To provide further evidence for this conclusion, we re-estimated the second mediation model after including sadness, anger, and frustration as covariates consistent with the methodological recommendations of Preacher and Hayes (2008). As reflected in Figure 1b, this analysis indicated that participants scored higher on boredom's experiential content in the high than in the low boredom condition, $B = 0.76$, $S_e = 0.28$, $\beta = 0.30$, $t(29) = 1.97$, $p = .06$, and the causal appraisal was more pronounced in the high versus the low boredom condition, $B = 1.47$, $S_e = 0.67$, $\beta = 0.35$, $t(29) = 2.23$, $p = .03$. Moreover, the non-mediated effect of the boredom manipulation on the experiential content was not significant ($t < 1$) while the appraisal was significantly associated with the experiential content, $B = 0.18$, $S_e = 0.07$, $\beta = 0.40$, $t(29) = 2.49$, $p = .02$. The mediated effect, estimated using 5,000 accelerated and bias-corrected bootstraps as recommended by Hayes (2009), confirmed the existence of a significantly mediated path, $0.00 < B_{95} < 0.74$, $S_e = 0.23$, $0.00 < \beta < 0.41$. These results further confirm our assumption that the experiential content of boredom experiences is distinct from other emotional states.

Discussion

This study had multiple purposes. Most importantly, we demonstrated that *state* boredom, manipulated via a task, resulted in the distinct pattern of experiences for boredom. In addition, no other emotional state (i.e., sadness, anger, or frustration) was affected by our manipulation and these other emotional states did not have a distinct association with the experiential content, thus indicating – consistent with the results of Study 1 – that boredom can be distinguished from other emotional states in terms of its experiential content. Finally, a mediation analysis further revealed that the increase in boredom's experiential content could be fully explained by the causal attribution of the affective state. That is, the specific *situation* (task) was associated with a pattern of feelings, thoughts, action tendencies, actions, and

emotivational goals that emerges when participants were bored and these experiences were distinct from other emotions.

The identified experiential content of boredom was again validated – this time by experimental induction, and it was distinct from sadness, anger, and frustration. This study adopted a broad perspective on the experience of boredom as it addressed an antecedent (here the interpretation of the situation), boredom’s experience, and the subsequent goals that boredom promotes. Effectively, this study further confirmed that boredom’s distinctiveness involves feeling restless and unchallenged at the same time, while thinking that the situation serves no purpose. One wants to engage in behavior that is different and purposeful, and this is accompanied by turning to activities that are considered to be meaningful.

General Discussion

Our research was designed to investigate what makes the boredom experience distinct from other affective states. Based on the literature of consequences of boredom, we adopted a meaning-regulation framework to conceptualize the typical boredom experience and how it is distinct from other emotional experiences. We tested our framework of boredom in a series of four studies. In Study 1, participants were asked to recall and describe a past experience of boredom, sadness, anger, or frustration and subsequently rated items that potentially captured the experiential content. We followed the procedure by Roseman and colleagues (1994) to identify boredom’s unique emotional signature across a variety of experiential content domains. Importantly, by comparing participants’ ratings of the feelings, thoughts, action tendencies, actions, and emotivational goals across the emotion conditions, we were able to assess the experiential configuration that *distinguished* boredom from other negative emotions. The results indicate that boredom has a unique experiential content: Boredom – experienced in educational settings, work settings, leisure contexts, and while being alone – involves feeling restless and unchallenged at the same time, while thinking that the situation

serves no purpose. One wants to engage in behavior that is different and purposeful, and this is accompanied by turning to activities that are considered to be meaningful.

The particular experiential content of boredom was validated in Study 2 by correlating it to one of the most often used boredom measures in research: the boredom proneness scale (Farmer & Sundberg, 1986). That is, a positive correlation was found between boredom's phenomenology and individual difference in boredom *proneness*, confirming that the identified distinct experiential content is indeed related to the construct of boredom. In Study 3, we correlated the identified experiential content to the *state* experiences of boredom assessed at the end of a psychology tutorial on date entry and giving labels to variables. These results indicate that the distinct experiential content of boredom is also related to actual state boredom experiences, thus further lending construct validity to the identified distinct boredom experience.

In Study 4, we manipulated state boredom directly by means of a repetitive task. As expected, greater boredom caused more of the typical, distinct experiences of boredom. Furthermore, the effect of the boredom induction on the distinct experiential content was mediated by the causal appraisal, in our case, the attribution of the affective state to the features of the situation. Note that the measured state boredom was associated with the typical experiential content whereas states of sadness, anger, and frustration could not explain this relationship, confirming once more that the boredom experience differs from that of other negative emotions. Adding to the research on what bored people look like (Wallbott, 1998), and to research that indicates that boredom is negative experience in which people make appraisals of low effort and little attention with bored people feeling that they have little on their minds and that they have a clear idea of what is going (Smith & Ellsworth, 1985), we thus provide evidence that boredom has a distinct experiential content, reflected in people's feelings, thoughts, action tendencies, actions and emotivational goals.

Essentially, our results highlight that the affective experience of boredom informs a person about the situation and the self (e.g., for an affect-as-information model see Schwarz & Clore, 2007; Clore & Bar-Anan 2007). Specifically, the experience informs a person that the present activity or situation lacks challenge and meaning, and that some effort needs to be taken in order to resolve this issue. In this sense, the affective state of boredom informs oneself about the situation that one is in. Importantly, this self-regulatory function of boredom is *distinct* in that it is not shared by affective experiences such as frustration, anger, or sadness, and the experience of boredom thus serves a relatively unique purpose

One benefit arising from a better understanding what it means to feel bored and how this differs from other negative emotions is the opportunity to *distinguish* between the effects that stem from each of these emotions. Many factors have been suggested to be either correlates or components of boredom, but it remains largely unclear whether they are really part of the experienced *boredom* rather than co-occurring affective states. Our research provides a first step in identifying unique components of boredom and adds to the understanding of consequences of boredom. Boredom research suggests that people who are easily bored may behave anti-socially by being aggressive (e.g., Rupp & Vodanovich, 1997). Dahlen and colleagues (2004), suggest that a significant part of the association of boredom proneness with aggression could *not* be explained by sensation seeking only. Our findings make it possible to develop tests of how boredom is experienced and how it affects behavior, with the potential of identifying factors that contribute to the boredom-aggression link.

The presented research provides a basis for a deeper understanding of the boredom experience and its potential consequences. Sure, it is not surprising that people don't want to engage in uninteresting activities, but our research goes far beyond this notion. Our research shows that boredom is associated with a particular experience on multiple levels, and our studies indicated that these experiences are most typical for boredom compared to sadness,

anger, and frustration. Most importantly, the boredom experience must not be understood as one particular experience (e.g., feeling restless, experiencing a lack of challenge), it is the *configuration* of experiences that makes it unique. Bored people feel restless and unchallenged, they think that the situation serves no purpose, they want to engage in behavior that is different and purposeful, and thus turn to activities that are considered to be meaningful. It is this affective signature that characterizes boredom and distinguishes it from other affective states, and understanding boredom helps in predicting its behavioral consequences. We wish to preclude the misunderstanding that challenge and meaning are the *only* two components that make boredom different from other affective states. Based on our reading of the literature on boredom experiences, we focus on ‘meaning’ and ‘challenge’ as the two concepts that are highly distinctive for boredom, and our hypothesis was confirmed across a series of four studies.

We started our investigation based on the procedure by Roseman and colleagues (1994; see also Frijda, 1986; Frijda et al., 1989; Van de Ven et al., 2009). This research investigated central experiential contents of emotions, that is, experiential contents that are relevant across emotions in general. As in Roseman and colleagues’ research, some overlap between these elements of experiential content is inherent in this approach. For example, ‘action tendencies’ must – to some degree – be related to other elements such as ‘actions’. Essentially, our results indicate that the meaning-regulation process of boredom is not only reflected in the motivational components of boredom (e.g., action tendencies, emotivational goals), but also manifest in the thoughts and feelings associated with boredom.

Based on the configuration of experiences that are distinctive for boredom, we further conclude that boredom is strongly associated with self-regulatory processes and especially two self-regulation goals seem to be promoted according to our findings. Boredom seems to make people strive for challenge or stimulation (e.g., Dahlen et al., 2004), and boredom

promotes the maintenance and restoration of the perception that one's activities are meaningful (e.g., Heine et al., 2006; see also Sansone et al., 1992). This is important and of great interest, as past research indicates that the need to re-establishment a sense of meaning has inspired an impressive amount of empirical work that identified many consequences of meaning-threats on people's attitudes and behaviors (for overviews, see Greenberg et al., 2004; Heine et al., 2006). This opens a wide array of directions in which the investigation of boredom can be pursued. On the broader level, our findings illuminate the prevalent *motivational* character of boredom. Consistent with classic boredom research by Leary and colleagues (1986), boredom is not merely a state of passivity, disinterest, or lack of arousal, but involves a strong self-regulatory component that is represented across the experiential domains of boredom.

Limitations and Future Directions

In order to preclude misunderstandings, we would like to add that the experience of boredom is likely to include more than a lack of challenge and meaning and subsequent responses to increase them again. Boredom may also promote other self-regulatory processes, for example to remain interested and increase fun (e.g., Nett, Goetz, & Hall, 2011; Sansone, 1992 Smith et al., 2009), and boredom may include physiological, cognitive, affective, and behavioral elements (e.g., Vodanovich, 2003) that we did not investigate. Based on earlier research, we sought to identify whether the *particular* boredom elements of meaning and challenge are central to the boredom experience and *differentiate* boredom from other affective states.

Future research may identify additional experiential contents of boredom and responses that we did not investigate. However, our research contributes to the understanding of the distinct experiential content of boredom and its consequences. Specifically, our meaning-regulation approach was confirmed and may thus open up many pathways to explain

and test the effects of boredom experiences on behavior. For example, to conceptualize boredom as an unpleasant emotion that suggests meaninglessness of one's activities, a lack of challenge, and the goal to re-establish a sense of meaningfulness may help to explain seemingly contradictory consequences of boredom. More specifically, although the literature suggests an association of boredom with aggression (Rupp & Vodanovich, 1997), we found in our own research that boredom promotes pro-social behavior (Van Tilburg & Igou, 2011a). Even though such findings may seem inconsistent at first sight, understanding what bored people experience can help to explain these findings. Specifically, needs for meaningfulness of one's activities and challenge may be served differently in particular situations. Aggression in one situation and pro-social behavior in another situation may provide adequate and functional means to re-establish a sense of meaningfulness or challenge. Although some research findings *seem* contradictory, they are likely to be rooted in the same experiential content of boredom.

It would be interesting if future research examined the extent to which challenge and meaning are distinctive for boredom depending on contextual influences. For example, research by Acee and colleagues (2010) suggests that in some cases, also overly challenging activities can be associated with boredom. These authors further suggest that one of the reasons why not only a lack of challenge but also certain over-challenging activities may be associated with boredom is because "both kinds of boredom register an absence of meaning" (p. 25). Possibly, boredom may to some extent also be experienced when only one the presently identified distinctive elements is present (e.g., lack of meaning), and whether this is the case may be dependent on the particular context of the boring situation or activity (see also Pekrun et al., 2010).

Conclusion

Boredom is a chore, an experience that relates to central human needs for meaningful and challenging activities. Understanding people's behaviors in part as attempts to cope with or to overcome boredom may help to reduce the occurrence of boredom or at least to reduce its potentially negative consequences, and to increase its potentially positive consequences. Therefore, our research on boredom is likely to contribute to this overarching goal.

References

- Acee, T. W., Kim, H., Kim, H. J., Kim J. I., Chu, H. R., Kim, M., Cho, Y., Wicker, F. W., & The Boredom Research Group (2010). Academic boredom in under- and over-challenging situations. *Contemporary Educational Psychology, 35*, 17-27.
- Barbalet, J. M. (1999). Boredom and social meaning. *British Journal of Sociology, 50*, 631-646.
- Bargdill, R. W. (2000). The study of life boredom. *Journal of Phenomenological Psychology, 31*, 188-219.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.
- Blaszczynski, A., McConaghy, N., & Frankova, A. (1990). Boredom proneness in pathological gambling. *Psychological Reports, 67*, 35-42.
- Clore, G. L. & Bar-Anan, Y. (2007). Affect-as-Information. In R. Baumeister & K. Vohs (Eds.) *Encyclopedia of Social Psychology*. Thousand Oaks, CA: Sage.
- Csikszentmihalyi, M. (2000). *Beyond boredom and anxiety: Experiencing flow in work and play*. San Francisco: Jossey-Bass.
- Dahlen, E. R., Martin, R. C., Ragan, K., & Kuhlman, M. M. (2004). Boredom proneness in anger and aggression: Effects of impulsiveness and sensation seeking. *Personality and Individual Differences, 37*, 1615-1627.
- Eastwood, J. D., Cavaliere, C., Fahlman, S. A., & Eastwood A. E. (2007). A desire for desires: Boredom and its relation to alexithymia. *Personality and Individual Differences, 42*, 1035-1045.

Fahlman, S. A., Mercer, K. B., Gaskovski, P., Eastwood, A. E., & Eastwood, J. D. (2009).

Does a lack of meaning cause boredom? Results from psychometric, longitudinal, and experimental analyses. *Journal of Social and Clinical Psychology, 28*, 307-340.

Farmer, R., & Sundberg, N. D. (1986). Boredom proneness – The development and correlates of a new scale. *Journal of Personality Assessment, 50*, 4-17.

Fisher, C. D. (1998). Effects of external and internal interruptions on boredom at work: Two studies. *Journal of Organizational Behavior, 19*, 503-522.

Frijda, N. H. (1986). *The emotions*. Cambridge, UK: Cambridge University Press.

Frijda, N. H. (1988). The laws of emotion. *American Psychologist, 43*, 349-358.

Frijda, N. H. (2007). *The laws of emotion*. Mahwah, NJ: Erlbaum.

Frijda, N. H., Kuipers, P., & Ter Schure, E. (1989). Relations among emotion, appraisal, and emotional action readiness. *Journal of Personality and Social Psychology, 57*, 212-228

Fromm, E. (1973). *The anatomy of human destructiveness*. New York, NY: Holt McDougal.

Gordon, A., Wilkinson, R., McGrown, A., & Jovanoska, S. (1997). The psychometric properties of the boredom proneness scale: An examination of its validity. *Psychological Studies, 42*, 85-97.

Greenberg, J., Koole, S. L., & Pyszczynski, T. (2004). *Handbook of experimental existential psychology*. New York: Guilford Press.

Heine, S. J., Proulx, T., & Vohs, K. D. (2006). The meaning maintenance model: On the coherence of social motivations. *Personality and Social Psychology Review, 10*, 88-110.

Kanevsky, L., & Keighley, T. (2003). To produce or not to produce? Understanding boredom and the honor in underachievement. *Roeper Review, 26*, 20-28.

- Kass, S. J., Vadanovich, S. J., & Callender, A. (2001). State-trait boredom: Relationship to absenteeism, tenure, and job satisfaction. *Journal of Business and Psychology, 16*, 317-327.
- Klapp, O. E., (1986). *Overload and boredom: Essays on the quality of life in the information society*. New York: Greenwood Press.
- Leary, M. R., Rogers, P. A., Canfield, R. W., Coe, C. (1986). Boredom in interpersonal encounters: Antecedents and social implications. *Journal of Personality and Social Psychology, 51*, 958-975.
- Lazarus, R. S., & Smith, C. A. (1988). Knowledge and appraisal in the cognition-emotion relationship. *Cognition and Emotion, 2*, 281-300.
- Nett, U. E., Goetz, T., & Hall, N. C. (2011). Coping with boredom in school: An experience sampling perspective. *Contemporary Educational Psychology, 36*, 49-59.
- Pekrun, R., Goetz, T., Daniels, L. M., Stupnisky, R. H., & Perry, R. P. (2010). Boredom in achievement settings: Control-value antecedents and performance outcomes of a neglected emotion. *Journal of Educational Psychology, 102*, 531-549.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavioral Research Methods, 40*, 879-891.
- Harris, J. J., & Segal, D. R. (1985). Observations from the Sinai: The boredom factor. *Armed Forces and Society, 37*, 235-248.
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis is the new millennium. *Communication Monographs, 76*, 408-420.
- Roseman, I. J., Wiest, C., & Swartz, T. S. (1994). Phenomenology, behaviors, and goal differentiate discrete emotions. *Journal of Personality and Social Psychology, 67*, 206-221.

- Rupp, D. E., & Vodanovich, S. J. (1997). The role of boredom proneness in self-reported anger and aggression. *Journal of Social Behavior and Personality, 12*, 925-936.
- Sansone, C., Weir, C., Harpster, L., & Morgan, C. (1992). Once a boring task always a boring task? Interest as a self-regulatory strategy. *Journal of Personality and Social Psychology, 63*, 379-390.
- Schachter, S., & Singer, J. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological Review, 69*, 379-399.
- Scherer, K. R. (1997). The role of culture in emotion-antecedent appraisal. *Journal of Personality and Social Psychology, 73*, 902-922.
- Scherer, K. R., Schorr, A., & Johnstone, T. (Eds.) (2001). *Appraisal processes in emotion: Theory, methods, research*. New York: Oxford University Press.
- Schwarz, N. & Clore, G.L. (2007). Feelings and Phenomenal Experiences. In E. T. Higgins & A. Kruglanski (Eds.), *Social Psychology. A Handbook of Basic Principles*. 2nd Ed. (pp. 385-407). New York: Guilford Press.
- Silvia, P. J. (2006). *Exploring the psychology of interest*. New York, NY: Oxford University Press
- Smith, C. A., & Ellsworth, P. C. (1985). Patterns of Cognitive Appraisal in Emotion. *Journal of Personality and Social Psychology, 48*, 813-838.
- Smith, J. L., Wagaman, J., & Handley, I. M. (2009). Keeping it dull or making it fun: Task variation as a function of promotion versus prevention focus. *Motivation and Emotion, 33*, 150-160.
- Stickney, M. L., & Miltenberger, R. G. (1999). Evaluating direct and indirect measures for the functional assessment of binge eating. *International Journal of Eating Disorders, 26*, 195-204.

- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (fifth ed). Boston, MA: Allyn & Bacon.
- Twenge, J. M., Baumeister, R. F, DeWall, C. N., Ciarocco, N. J., & Bartels, J. M. (2007). Social exclusion decreases prosocial behavior. *Journal of Personality and Social Psychology, 92*, 56-66.
- Van de Ven, N., Zeelenberg, M., & Pieters, R. (2009). Leveling up and down: The experiences of benign and malicious envy. *Emotion, 9*, 419-429.
- Van Tilburg, W. A. P., & Igou, E. R. (2011a). Why bored George helps others; A pragmatic meaning-regulation hypothesis on boredom and prosocial behavior. *Under Review*.
- Van Tilburg, W. A. P., & Igou, E. R. (2011b). On boredom and social identity: A pragmatic meaning-regulation approach. *Under Review*.
- Vodanovich, S. J. (2003). Psychometric properties of boredom: A review of the literature. *Journal of Psychology, 137*, 569-595.
- Vodanovich, S. J., & Kass, S. J. (1990). A factor analytic study of the boredom proneness scale. *Journal of Personality Assessment, 55*, 115-123.
- Vodanovich, S. J., Verner, K. M., & Gilbride, T. V (1991). Boredom proneness: Its relationship to positive and negative affect. *Psychological Reports, 69*, 1139-1146.
- Wallbott, H. G. (1998). Bodily expression of emotion. *European Journal of Psychology, 28*, 879-896.

Footnotes

¹ Following Roseman (1994), the term ‘emotivational goal’ refers to motivational components that are specifically related to *emotions*.

² For the items that did not work in their original research (e.g., actions of frustration) we developed items in order to have an equal amount of items for each emotion. Details can be provided on request.

³ Across all studies, no main or interaction effects of gender and age were observed besides a single very small significant association between age and the boredom item “want to do something meaningful” of Study 1. Specifically, a 2-way ANCOVA with this item as dependent variable and the emotion condition and gender as independent variables revealed that participants’ endorsement of the item increased with age. $F(1, 94) = 3.86, p = .05, \eta^2 = .04$ ($B = .08, S_e = .04$). This association, however, did not interfere with the effect of interest.

⁴ Even though the experiential content of sadness, anger, and frustration were not of primary interest for the current investigation, the original findings by Roseman and colleagues (1994) were largely replicated. Details can be provided on request. Interestingly, the sadness item ‘...feel very tired’ was found to be significantly more endorsed for boredom compared to each of the other emotions (all $ps < .05$). Although our investigation focused primarily on challenge and meaning, this item may be considered for inclusion in future research.

⁵ No adjustments to the α -level were made because we made explicit predictions for each of the comparisons. Specifically, we predicted that participants would give higher ratings for the ten boredom items in the boredom condition relative to participants in the sadness, anger, or frustration conditions. Similarly, Roseman and colleagues (1994), whose approach served as basis for our Study 1, explain why adjustments would not be adequate (p. 208). However, to rule out any concerns in this regard, we checked the data after making Bonferroni corrections to the α -level. First of all, we correcting for the total amount of 12 ANOVAs by adopting an

α -level of .004. Importantly, the critical ANOVAs associated with the seven distinct items, the ANOVA on the entire boredom content, and also the ANOVA on the composite of the distinct boredom content remained significant (all $ps \leq .002$). We also examined the specific comparisons after adopting an α -level of .008, correcting for the 6 specific comparisons after each of the ANOVA's. Importantly, people's scores in the boredom condition were still significantly higher compared to those in the other conditions for each of the seven distinct boredom items, the entire boredom content, and also the composite of boredom's distinct content (all $ps \leq .007$).

⁶ It should be noted that the identified category frequencies were too small for testing the statistical reliability of these differences.

⁷ The sample size was relatively small compared to the other studies. Please note, however, that the study contained only two conditions and that the effect sizes of the predicted significant main effects are considerable ($.13 \leq \text{all } \eta^2\text{s} \leq .19$). Moreover, sample sizes such as those in Study 4 are quite common in social psychology experiments that are part of a series of studies (e.g., Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007, p. 57).

⁸ Correlation analyses indicated that state boredom was significantly correlated with anger, $r = .47, p < .01$, and frustration, $r = .64, p < .001$, not with sadness, $r = .19, p = .27$. Moreover, anger significantly correlated with sadness, $r = .61, p < .001$, and frustration, $r = .76$, and also sadness and frustration were significantly correlated, $r = .47, p < .01$. These correlations are consistent with the general notice that the four experiences share elements and these correlations further subscribe to the importance of identifying how these emotional states *can* be distinguished from each other, as done in our research. Importantly, our manipulation affected boredom in particular and did not significantly alter levels of sadness, anger, and frustration.

⁹ The mediation analysis procedure by Preacher and Hayes (2008) does not include β -coefficients in the output. We have therefore estimated the Beta's by performing the same mediation analyses after standardizing the involved variables.

Table 1

Experiential Content Items of Boredom (Study 1).

	Item	Question
Feelings	1	...feel restless and unchallenged at the same time?*
	2	...feel that you did not know what to do with your time?
Thoughts	3	...unable to stop thinking about things you would rather do?
	4	...think that the situation served no important purpose?*
Action Tendencies	5	...feel like doing something completely different?*
	6	...feel like doing something purposeful?*
Actions	7	...change to more exiting behaviors?
	8	...turn to a more meaningful activity?*
Emotivational Goals	9	...want to do something more meaningful?*
	10	...want to be challenged?*

Note: * Item was distinctive for boredom relative to sadness, anger, and frustration.

Table 2

Results for the Experiential Content Items of Boredom (Study 1).

Boredom Items		Boredom			Sadness			Anger			Frustration			<i>F</i>	<i>p</i>	η^2
		<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>			
Feelings	Item 1*	4.00 _a	1.12	28	2.59 _b	1.40	22	2.21 _b	1.18	24	2.15 _b	1.26	27	13.28	.000	.29
	Item 2	3.96 _a	0.85	27	3.78 _a	1.28	23	2.95 _b	1.33	22	2.78 _b	1.48	27	5.69	.001	.15
Thoughts	Item 3	3.93 _a	1.39	28	2.96 _b	1.37	24	3.78 _a	1.38	23	3.25 _{ab}	1.51	28	2.63	.055	.07
	Item 4*	3.75 _a	1.11	28	1.96 _b	1.20	24	2.35 _b	0.89	23	2.67 _b	1.31	28	12.63	.000	.28
Action Tendencies	Item 5*	4.50 _a	0.79	28	3.13 _b	1.54	24	3.50 _b	1.59	24	3.56 _b	1.22	27	5.37	.002	.14
	Item 6*	4.54 _a	.79	28	3.42 _b	1.53	24	2.83 _b	1.34	24	3.11 _b	1.32	28	9.49	.000	.22
Actions	Item 7	3.04 _a	1.26	27	2.04 _b	1.27	24	2.92 _{ac}	1.25	24	2.29 _{bc}	1.15	28	3.92	.011	.07
	Item 8*	3.50 _a	1.07	28	2.42 _b	1.35	24	2.29 _b	1.20	24	2.50 _b	1.00	28	6.27	.001	.16
Emotivational Goals	Item 9*	4.43 _a	0.74	28	3.50 _b	1.41	24	2.22 _c	1.24	24	2.96 _b	1.14	28	16.94	.000	.34
	Item 10*	4.22 _a	1.05	27	3.00 _{bc}	1.53	24	3.13 _b	1.30	24	2.41 _c	1.28	27	9.23	.000	.22

Note: Higher scores indicate agreement. Means in a single row with different subscript significantly differ at the .05 level in contrast analyses.

* Item was distinctive for boredom relative to sadness, anger, and frustration according to our conservative criterion.

Table 3

Results for the Aggregated Experiential Content of Boredom (Study 1).

Experiential Content Measure	Boredom			Sadness			Anger			Frustration			<i>F</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>			
Entire Experiential Content	3.99 _a	0.44	28	2.88 _b	0.74	24	2.82 _b	0.63	24	2.77 _b	.70	28	23.44	.000	.41
Distinctive Experiential Content	4.14 _a	0.45	28	2.86 _b	0.86	24	2.65 _b	0.72	24	2.75 _b	0.71	28	27.85	.000	.46

Note: Higher scores indicate agreement. Means in a single row with different subscript significantly differ at the .05 level in contrast analyses.

Table 4

The Effects Copying References on Experiences (Study 4).

Dependent Variable	Boredom Manipulation						<i>F</i>	<i>p</i>	η^2
	Low Boredom			High Boredom					
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>			
Task Boringness	3.00	2.00	17	4.83	1.95	18	7.55	.01	.19
Boredom's Experiential Content	3.30	0.87	17	4.05	0.90	18	6.21	.02	.16
State Boredom	2.65	1.17	17	3.61	1.42	18	4.75	.04	.13
State Sadness	2.00	1.28	17	1.44	0.71	18	2.59	.12	.07
State Anger	1.82	1.07	17	2.00	1.33	18	.19	.67	.01
State Frustration	2.24	1.44	17	2.72	1.67	18	.85	.36	.03

Note: Higher scores indicate higher perceived boringness of the task, greater endorsement of boredom's experiential content, and more boredom, sadness, anger, and frustration.

Figure 1a: *Mediation by Causal Appraisal on the Experiential Content (Study 4).*

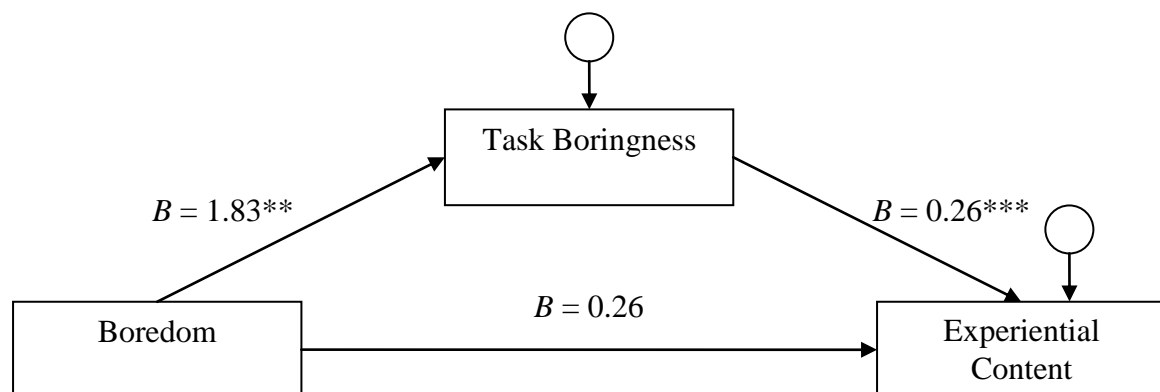


Figure 1a: The mediation model on manipulated boredom, task boringness, and the experiential content of boredom, as analyzed in Study 4. Estimates were obtained using the mediation procedure suggested by Preacher and Hayes (2008), employing an accelerated and bias-corrected bootstrap estimation method for the indirect effect, with 5,000 bootstraps. $** p < .01$, $*** p < .001$. Indirect effect of the boredom manipulation on experiential content: $0.11 < B_{95} < 1.04$, $S_e = 0.23$.

Figure 1b: *Mediation by Causal Appraisal on the Experiential Content, While Controlling for Sadness, Frustration, and anger. (Study 4).*

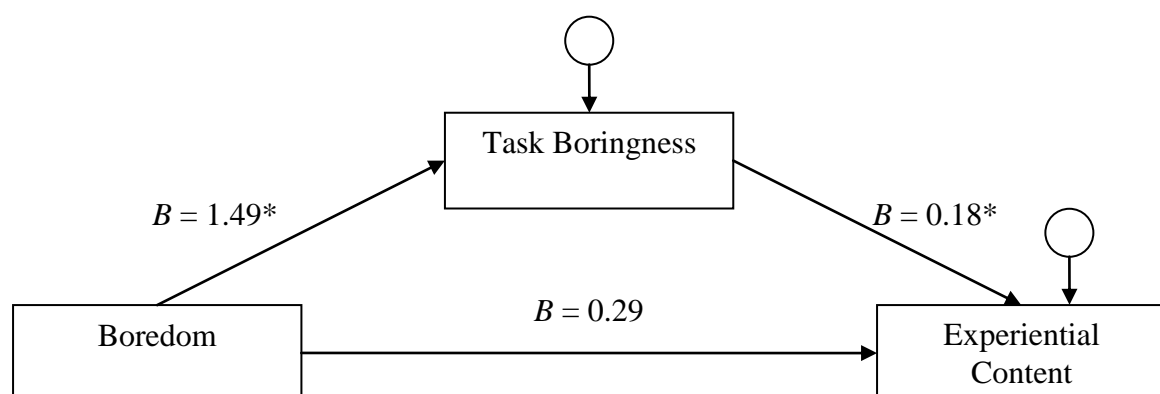


Figure 1b: The mediation model on manipulated boredom, task boringness, and the experiential content of boredom while controlling for sadness, anger, and frustration as analyzed in Study 4. Estimates were obtained using the mediation procedure suggested by Preacher and Hayes (2008), employing an accelerated and bias-corrected bootstrap estimation method for the indirect effect, with 5,000 bootstraps. $* p < .05$. Indirect effect of the boredom manipulation on experiential content: $0.00 < B_{95} < 0.74$, $S_e = 0.19$.