Can Boredom Help?

Increased Prosocial Intentions in Response to Boredom

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Abstract

Boredom is typically regarded a nuisance. Past research on boredom depicts this common emotion as a correlate of many detrimental psychological and social factors, including addiction, depression, discrimination, and aggression. We present a more nuanced perspective on boredom. Specifically, we propose and test that state boredom serves an important self-regulatory function with the potential to foster positive interpersonal consequences: It signals a lack of purpose in activity and fosters a search for meaningful engagement. We examined whether boredom can subsequently cause prosocial intentions if the corresponding prosocial behavior is seen as purposeful. As predicted, boredom, which is characterized by a search for meaning (Pilot Study), promoted prosocial intentions (Experiment 1), in particular when the corresponding behavior was seen as highly meaningful (Experiment 2). Our novel findings suggest that boredom can have desirable consequences, and recasts this emotion as not merely good or bad but rather as personally and socially functional.

Keywords: boredom, helping, meaning, self-regulation, interpersonal behavior

Can Boredom Help? Increased Prosocial Intentions in Response to Boredom

Boredom is "the aversive experience of wanting, but being unable, to engage in satisfying activity" (Eastwood, Frischen, Fenske, & Smilek, 2012, p. 482). It is a common emotion (e.g., Larson & Richards, 1991; Van Tilburg & Igou, 2012) that impacts on many domains in life: Boredom reduces work enjoyment (Lee, 1986), hampers education (Robinson, 2011), increases unhealthy consumption (Moynihan, Van Tilburg, Igou, Wisman, Donnelly, & Mulcaire, 2015), undermines pleasant leisure (Gordon & Caltabiano, 1996), and even sexual activities are not protected from boredom's clutches (Watt & Ewing, 1996). Furthermore, boredom has been associated with a host of specific psychological and social dysfunctions, including depression, outgroup derogation, and unsafe driving, as well as aggression, eating disorders, and pathological gambling (Blaszczynski, McConaghy, & Frankova, 1990; Gordon, Wilkinson, McGrown, & Jovanoska, 1997; Kass, Vodanovich, & Callender, 2001; Rupp & Vodanovich, 1997; Stickney & Miltenberger, 1999; Van Tilburg & Igou, 2011a; Verwey & Zaidel, 2000; Vodanovich, 2003). Clearly, boredom is an influential feature of life, and apparently not a desirable one, as these findings attest.

Boredom is an unpleasant experience, but does it always come with negative consequences, or can boredom also yield positive outcomes? We suggest that it can. Specifically, we propose that boredom can promote prosocial intentions, conditional on whether or not the corresponding prosocial behavior is perceived as a viable strategy for feeling purposeful. Investigating the link between boredom and prosocial intentions is not only novel but also counter-intuitive; past research has associated boredom proneness, that is, the vulnerability to become bored, almost exclusively with aversive correlates (e.g., Dahlen et. al, 2004; Rupp & Vodanovich, 1997; see also Fromm, 1973), yet, closer inspection of the particular motives associated with boredom (e.g., a search for meaningful engagement) suggests a much richer array of potential consequences that may go beyond mere negative outcomes. Moreover, few studies have addressed the actual *experience* of boredom and have almost exclusively focused on the *disposition* to feel bored (for exceptions, see Eastwood et al., 2012; Sansone et al., 1992; Smith et al., 1992). Investigating the actual experience may provide particularly valuable insights in the motivational character of boredom (Van Tilburg

& Igou, 2016) and can shed light on causal relationships with subsequent behavior. First, we discuss the psychological profile of boredom and the self-regulatory function it fulfills.

Boredom

Boredom typically emerges in situations that involve repetition, meaningless tasks, or a lack of challenge given one's skills (e.g., Barbalet, 1999; Csikszentmihalyi, 1990; Fahlman, Marcer, Gaskocski, Eastwood, & Eastwood, 2009; Frankl, 1963; Sansone, Weir, Harpster, & Morgan, 1992; Van Tilburg & Igou, 2012). Boredom catalysts include feeling powerless, alienated, or detached (Kuhn, 1976; Fromm, 1972).

Feeling bored is unpleasant and shares elements with other negative affective states such as sadness, frustration, and anger (Smith, Wagaman, & Handley, 2009; Van Tilburg & Igou, 2012). Similar to sadness, boredom often involves a low level of arousal (Smith & Ellsworth, 1985); boredom shares with frustration that people may wish to disengage from the current activity (Kanevsky & Keighley, 2003; Klinger, 1975), and people who are prone to boredom are more likely to get angry (e.g., Dahlen, Martin, Ragan, Kuhlman, 2004). Different from sadness, frustration, and anger, however, boredom involves a unique pattern of appraisals and motivations revolving around the perception of lacking purpose (Van Tilburg & Igou, 2012; Van Tilburg & Igou, 2016). Specifically, people who experience boredom appraise the situation or behavior as particularly devoid of purpose, and they seek for opportunities to re-instigate a sense of meaningful engagement (Van Tilburg & Igou, 2012; Van Tilburg, Igou, & Sedikides, 2013).

Boredom serves as a marker of lack of purpose and serves as motivational impulse that steers people towards engagement in behaviors that seem more worthwhile, which, in turn, could restore a sense of purpose (Van Tilburg & Igou, 2012; 2013). In essence, boredom serves as the proverbial 'gadfly sting' that makes people aware of their inability to successfully engage in the pursuit of valuable goals and subsequently inspires the search for meaningful engagement. "Boredom emotionally register an absence of meaning and leads the actor in question towards meaning," noted the sociologist Barbalet (1999, p. 631). Indeed, the acknowledgement of an existential feature of boredom is shared by many scholars, including Fromm (1972, 1973) and Schopenhauer (1851/2009).

Past research shows that state boredom makes people bolster meaning-laden political ideologies (Van Tilburg & Igou, in press), boosts valuation of ingroup representations (e.g., symbols; Van Tilburg & Igou, 2011a; 2011b), and triggers the retrieval of meaningful nostalgic memories (Van Tilburg, Igou, & Sedikides, 2013), attesting to boredom's relevance for regulating (perceived) purposeful engagement. Essentially, boredom serves as self-regulatory cue that breeds commitment to meaningful action, hence fulfilling an important existential function. One potential consequence of this self-regulatory process, we hypothesize, is an increase in prosocial intentions.

Boredom, Meaning, and Prosocial Intentions

Research in the domain of existential psychology suggests that people strive to perceive their activities and lives as meaningful (see Greenberg, Koole, & Pyszczynski, 2004; Heine et al., 2006). Specific behaviors are appraised as meaningful when they appear to provide an effective means in the pursuit of goals that people embrace, provided that these goals yield high value to the individuals (Van Tilburg & Igou, 2012).

When people face challenges towards perceiving their life and actions as meaningful, for example due to death reminders (e.g., Greenberg et al., 2004), uncertainty (e.g., Van den Bos, 2001), or social exclusion (e.g., Case & Williams, 2004), then people become motivated to restore a sense of purpose. Heine and colleagues (2006) suggest that people are flexible when it comes to regulating perceived meaning. Specifically, when perceptions of meaning are threatened, then people can usually employ a variety of strategies (e.g., boosting self-esteem, increasing belongingness, adhering to worldviews, increasing certainty) that all contribute to the overarching perception that life is meaningful. Essentially, people are *pragmatic* when it comes to meaning-regulation. That is, seeking to re-establish a sense of meaning makes people sensitive to the extent to which a potential course of action suits this purpose and they subsequently engage in corresponding behaviors (e.g., Van Tilburg & Igou, 2011a, Study 4). In other words, people who strive for meaning are more attuned to actions that facilitate their goal-pursuit (e.g., see Heckhausen & Heckhausen, 2008: see also Kruglanski, Shah, Fishbach, Friedman, Chun, & Sleeth-Keppler, 2002; Shah & Kruglanski, 2000, 2003). Effectively, we posit that by emotionally signaling a lack of meaning in activity,

boredom turns people away from current behavior in favor of alternatives that are perceived as instrumental in the pursuit of (more) valuable goals.

The literature strongly suggests that belongingness is an example of a generally valued goal, and prosocial behavior is in turn likely to be considered as highly meaningful (e.g., Caprara & Steca, 2005; Furrow, King, & White, 2004; Shek, Ma, & Cheung, 1994; see also Heine et al., 2006). Indeed, past research indicates that people engage in prosocial behavior (e.g., charity support) to counteract meaning-threats such as death awareness (Jonas, Schimel, Greenberg, & Pyszczynski, 2002 see also Joireman & Duell, 2005; Joireman & Duell, 2007). Boredom serves as an affective cue that a specific activity or situation lacks meaning and this affective spark facilitates the pursuit of meaningful engagement. Consistently, Barbalet stated that: "Boredom is anxiety about the absence of meaning in a person's activities or circumstances" (1999, p. 641). We therefore propose that boredom fosters a search for meaning (Pilot Study), and can increase prosocial intentions (Experiment 1), provided that the corresponding prosocial behavior is meaningful (Experiment 2).

Pilot Study: Does boredom induce a search for meaningful engagement?

The link we propose between boredom and prosociality rests on the assumption that boredom is characterized by a search for meaningful engagement. Before turning to the main experiments, we tested this assumption in a pilot study. Forty-one people residing in the USA and recruited on MTurk (www.MTurk.com; 18 men, 21 women, 2 undisclosed; M_{age} = 42.87, *SD* =14.41) took part in an online and randomized between-subjects study (boredom: high vs. low). After reporting demographics, they watched a 10 minute extract of an instructional video on fish farming (high boredom; Moynihan et al., 2015) or an equally long extract from a BBC documentary on ocean life. As a manipulation check, participants then indicated how bored they felt ("To what extent did the movie you just watched make you feel bored?"; 1=*not at all*, 7=*very much*). Next, we assessed participants' desire to engage in more meaningful behavior ("To what extent would you like to do something more meaningful?; 1=*not at all*, 7=*very much*; Moynihan, Igou, & Van Tilburg, 2016; Van Tilburg & Igou, 2011a). Participants also reported age, gender, country of residence, and ethnicity. Afterwards, participants were thanked and debriefed.

A one-way ANOVA on the boredom manipulation check confirmed that participants in the high boredom condition felt more bored (M = 4.61, SD = 2.03) than those in the low boredom condition (M = 3.10, SD = 2.10), $F(1,37) = 5.21$, $p = .03$, $\eta^2 = .12$. Likewise, participants in the high boredom condition expressed a greater desire to subsequently do something meaningful (M = 5.94, SD = 1.39) relative to those in the low boredom condition (M = 4.43, SD = 1.96), $F(1,37) = 7.49$, $p < .01$, $\eta^2 = .17$.

We assumed that people's experience of boredom is responsible for the increased levels of meaning search in the high (vs low) boredom condition. Indeed, further analyses indicated that meaning search significantly and positively correlated with reported levels of boredom, $r = .72$, $p < .001$. In addition, a mediation analysis indicates that the effect of the boredom manipulation (dummy coded: 0 = *low*, 1 = *high*) on meaning search was significantly mediated by the levels of boredom that the manipulation induced, $B = 0.85$, $SE = 0.41$, CI 95% = [0.12, 1.71] (5,000 bias-corrected and accelerated bootstraps; Hayes, 2009); the (non-mediated) direct effect of the boredom manipulation on meaning search seized to be significant, $B = 0.66$, $SE = 0.44$, $t(36)$, $p = .14$. These results support the notion that boredom is characterized by an elevated search for meaning, consistent with prior research (e.g., Van Tilburg & Igou, 2011a; 2012; 2016, in press). In addition, the correlational and mediational results support our assumption that the experience of boredom in particular is responsible for the heightened search for meaning amongst those in the high boredom condition.

Experiment 1

The Pilot Study supported our assumption that boredom involves a desire to engage in more meaningful engagement. We initiated our main investigation by testing whether boredom subsequently increases prosocial intentions. We did so by inducing boredom with a repetitive task, followed by a measure of charity support intentions.

Method

Participants and design. Thirty-one students (10 men, 21 women; M_{age} = 19.70, *SD* = 1.77) participated in a between-subjects study (boredom vs. control) in exchange for 3 Euros.[1]

Procedure and materials. After participants reported demographic information, we induced boredom via a 'repetitive odds-estimation task.' This computer task consisted 200 trials in which the participants had to guess the odds of selecting a blue or red ball of a random distribution of colored balls. Participants in the control condition did not engage in this task prior to the dependent measures. We conducted an additional pilot study (N = 16) to check for the effectiveness of the manipulation. Specifically, a pre-test post-test design confirmed that the engagement in a repetitive task increased participants' boredom (M_{pre} = 2.81, SD_{pre} = 1.987 vs. M_{post} = 4.06, SD_{post} = 2.11), $t(15) = 3.74$, $p < .01$, $d = 1.93$.[2]

After the repetitive odds-estimation task, we measured prosocial intentions. In particular, we gave participants a description of an initiative that promoted educational services in Zambia. The description informed participants that their university planned to start a large scale promotion for this charity project. The organizers behind the project issued that they were interested in whether it was realistic to start an extensive charity campaign for this cause and they wanted to know how much people would be willing to donate to the charity campaign. A small promotional poster was printed on the form with the header:

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[1] Three participants were excluded. Two did not respond to the charity donation question and one was a multivariate outlier (e.g., Tabachnick & Fidell, 2000): Mahalanobis distance was calculated for each participant by regressing a standard normally distributed random variable on the dummy coded boredom condition and donation intentions. One case exceeded $\chi^2(2) = 18.4$ ($p < .0001$) and was therefore excluded.

[2] We conducted another pilot study in which 82 students (16 men, 66 women, M_{age} = 20.29, *SD* = 4.05) were randomly assigned to the high versus low boredom condition similar to Experiment 1, and reported the intensity of 10 emotions (listed in Dutch alphabetical order: fear, envy, frustration, hope, shame, pride, boredom, sadness, disgust, anger; 1 = *not at all*, 7 = *very much*). Then, they also indicated how purposeless, meaningless, senseless, 'valueless' (in Dutch: 'waardeloos', meaning without value), and insignificant they felt (1 = *not at all*, 7 = *very much*; α = .92). The repetitive task increased boredom (M = 4.79, SD = 1.72 vs. M = 2.97, SD = 1.50), $F(1, 80) = 25.94$, $p < .001$, $\eta^2 = .25$, and meaninglessness, (M = 2.94, SD = 1.34 vs. M = 2.18, SD = 1.02), $F(1, 80) = 8.15$, $p < .01$, $\eta^2 = .09$. None of the 9 other emotions significantly differed between conditions (all ps ≥ .21).

"Make a difference for your fellow people." The description further issued that potential donations were kept confidential. Following the charity description, participants were asked "If you made a single donation, then how much would you want to give to this initiative?", and indicated this amount in a following empty space: "_____ Euro". Afterwards, participants were thanked and debriefed.

Results and Discussion

Participants' intended donations were entered as a dependent variable into a one-way ANOVA with the boredom induction as independent variable. The analysis revealed significant differences between the conditions, $F(1, 29) = 7.67$, $p = .01$, $\eta^2 = .21$. Consistent with the predictions, participants were indeed willing to give more money to charity when they were in the boredom condition ($M = 12.94$, $SD = 9.31$) than when they were in the control condition ($M = 5.73$, $SD = 3.96$).[3] These findings confirm that boredom has the potential to facilitate prosocial intentions. (Due to the small sample size we subjected the data of Experiment 1 to a meta-analysis; see Mini Meta-Analysis.)

Experiment 2

The results of the previous experiment suggest that boredom can promote prosocial intentions. In Experiment 2, we investigated if these intentions follow from boredom because the corresponding prosocial behavior offers people a purposeful activity. That is, we tested whether boredom would promote prosocial intentions a function of whether the intended behavior in question served as more or less meaningful activity towards helping others (Van Tilburg & Igou, 2013). For this purpose, we confronted participants either one of two alternative charities: a charity that is highly effective or a charity that is only moderately effective in building schools. If boredom promotes charitable intentions in the attempt to feel purposeful then boredom should only do so when the charity is relatively instrumental versus when it is not. We predicted that particularly under high boredom people would be sensitive to the instrumentality of their actions, hence increasing their willingness to donate to the charity support that has the greatest potential to do something purposeful; little bored

[3] A t-test with corrections for the unequal standard deviations yielded similar results, $t(20.51) = 2.83$, $p = .01$, $d = 1.25$.

participants would not be as strongly affected by the instrumentality of the prosocial behavior.

Method

Participants and design. Eighty-eight students (26 men, 62 women; M_{age} = 20.69, *SD* = 3.95) were randomly assigned to either one of the 4 conditions of a 2 (boredom: high vs. low) × 2 (instrumentality: high vs. low) between-subjects design in exchange for course credit.[4]

Procedure and materials. Participants were seated in cubicles and gave their informed consent. Next, participants provided demographic information and completed a 'square frequency estimation' task on the computer (Van Tilburg & Igou, 2011a). In this computer task participants were presented with a series of trials. For each trial, participants were shown 5 to 15 squares for 1.5 seconds. Immediately after seeing these squares the participants had to guess how many they had seen by selecting the correct number from a list of numbers depicted on the screen. Participants in the low boredom condition performed 50 of these trials, whereas participants in the high boredom condition completed 100 trials. After this task, participants completed the manipulation checks. First they rated the extent to which they experienced boredom on a scale from 1 (*not at all*) to 7 (*very much*). Participants also indicated if they felt sad (1 = *not at all*) to 7 (*very much*), and the extent to which they experienced a sense of meaninglessness, purposelessness, senselessness, valuelessness[5], and insignificance 1 (*not at all*) to 7 (*very much*; α = .95).

After the computer task, participants received a modified description of the charity organization in Experiment 1. In the *low instrumentality* condition we added a paragraph to the charity description stating that an independent developmental aid monitor had evaluated the project as "undoubtedly ambitious and well meant, but not very effective due to the lack of structural help and cooperation with other projects" and further stated that "Investments in

[4] Four outliers were excluded (Tabachnick & Fidell, 2000). We calculated Mahalanobis distance for each participant by regressing a standard normally distributed random variable on on the dummy coded boredom condition, experienced boredom, meaninglessness, dummy coded instrumentality, and donation intentions. Four individuals exceeded, $\chi^2(5) = 25.7$ ($p < .0001$), and were therefore excluded.

[5] The original Dutch term was "waardeloos."

such a project will for the major part be wasted due to local corruption and excessive bureaucracy." In the *high instrumentality* condition, these sentences read that the project was "undoubtedly ambitious and well meant, but most of all effective due to the presence of structural help and cooperation with other projects", and further stated that "Investments in such a project will for the major part support the foundation that is required for a better future." Participants were asked "If you would make a single donation, then how much would you want to give to this initiative?", indicated on "_____ Euro". Afterwards, participants were thanked and debriefed.

Results and Discussion

Boredom. Participants' scores on the boredom measure were entered as a dependent variable into a one-way ANOVA with the boredom induction as independent variable. Participants experienced more boredom in the high boredom condition (M = 6.12, SD = 0.99) compared to those in the low boredom condition (M = 3.93, SD = 1.88), $F(1, 84) = 43.72$, $p < .001$, $\eta^2 = .34$.

Meaninglessness. A one-way ANOVA with the boredom induction as independent variable and participants' averaged scores on the meaninglessness items as dependent variable indicated that participants in the high boredom condition experienced greater meaninglessness (M = 5.07, SD = 1.24) compared to participants in the low boredom condition (M = 2.83, SD = 1.61), $F(1, 84) = 51.53$, $p < .001$, $\eta^2 = .38$.

Charity support. Participants' donation intentions were entered as a dependent variable into a two-way ANOVA with the boredom induction and the charity's instrumentality manipulation as independent variables. This analysis revealed a non-significant main effect of instrumentality, $F(1, 81) = 1.81$, $p = .18$, $\eta^2 = .02$, and a significant main effect of the boredom induction on intended charity support , $F(1, 81) = 14.05$, $p < .001$, $\eta^2 = .15$, reflecting that participants in the high boredom condition felt more like giving to charity (M = 11.21, SD = 10.60) compared to participants in the low boredom condition (M = 4.43, SD = 4.20). Importantly, the predicted interaction effect was obtained, $F(1, 81) = 4.02$,

$p = .05$, $\eta^2 = .05$.[6] As reflected in Figure 1, participants were willing to donate most to an instrumental charity in the high boredom condition ($M = 13.52$, $SD = 12.03$) compared participants in the low boredom condition ($M = 3.83$, $SD = 2.14$), $t(81) = 4.19$, $p < .001$, compared to participants in the high boredom condition who considered the low instrumental charity ($M = 7.88$, $SD = 7.23$), $t(81) = 2.27$, $p = .03$, and compared to the participants in the low boredom and low instrumentality condition ($M = 4.94$, $SD = 5.35$), $t(81) = 3.88$, $p < .001$. These latter three conditions, however, did not differ significantly from each other (all ps > .12).[7]

Exploratory analyses. We next explored if boredom and a lack of perceived meaning were responsible for the higher donation intentions that we observed in the high (vs low) boredom condition—when the charity's instrumentality was high. First of all, participants' experienced boredom correlated significantly with meaninglessness ($r = .71$, $p < .001$) and boredom significantly correlated with donation intensions ($r = .27$, p = .01). Also meaninglessness correlated with donation intensions ($r = .31$, $p = .04$). Moreover, whereas boredom and donation intensions correlated significantly in the high instrumentality condition, that is, when donations were particularly meaningful ($r = .33$, $p = .03$), these variables did not correlate significantly in the low instrumentality condition ($r = .22$, $p = .18$). The same was true for meaninglessness, which correlated significantly with donation intensions under high ($r = .40$, $p < .01$), but not low, instrumentality of charity support ($r = .24$, $p = .14$). These findings are consistent with our proposition that boredom, and the

[6] Contrast analyses with corrections for the unequal standard deviations yielded similar results: a main effect of boredom, $t(46.47) = 3.82$, $p < .001$, $d = 1.13$, a non-significant main effect of instrumentality, $t(46.47) = 1.37$, $p = .18$, $d = 0.40$, and the critical significant interaction, $t(46.47) = 2.04$, $p = .05$, $d = 0.60$.

[7] Participants in the high boredom condition felt slightly sadder ($M = 2.20$, $SD = 1.27$) than those to the low boredom condition ($M = 1.72$, $SD = 1.09$), $F(1, 84) = 3.62$, $p = .061$, $\eta^2 = .04$. The boredom induction yielded a significant effect after controlling for sadness in our analyses of experienced boredom and meaninglessness, $F(1, 83) = 38.83$, $p < .001$, $\eta^2 = .32$, and $F(1, 83) = 45.39$, $p < .001$, $\eta^2 = .35$, respectively. The difference in sadness across conditions seized to be significant after controlling for boredom or meaninglessness, $F(1, 83) = 0.58$, $p = .45$, $\eta^2 = .01$, and $F(1, 83) = 0.00$, $p = .99$, $\eta^2 = .00$, respectively. The boredom condition × instrumentality interaction on donation intentions remained significant after controlling for sadness, $F(1, 83) = 4.30$, $p = .04$, $\eta^2 = .05$

meaninglessness that this emotion signals, is responsible for heightening intentions to donate to a highly instrumental (and hence meaningful) charity in particular.

To further explore if experienced boredom and meaninglessness accounted for the increase in donation intentions for the highly instrumental charity, we estimated a mediation model. Given that we had a moderator in this study (instrumentality), we selected the Model 14 moderated mediation analysis by Hayes (2012). Using this model, we found a significant indirect effect of the boredom induction on donation intentions under high instrumentality, *B* = 1.56, *SE* = 0.98, *CI* 95% = [0.04, 4.10] (5,000 bias-corrected and accelerated bootstraps; Hayes, 2009) but not under low instrumentality of charity support, *B* = -0.08, *SE* = 1.57, *CI* 95% = [-3.81, 2.58] (5,000 bias-corrected and accelerated bootstraps). Likewise, meaninglessness mediated the impact of the boredom induction in the high, *B* = 3.03, *SE* = 1.52, *CI* 95% = [0.37, 6.47] (5,000 bias-corrected and accelerated bootstraps), but not low, *B* = 0.01, *SE* = 1.33, *CI* 95% = [-2.65, 2.69] (5,000 bias-corrected and accelerated bootstraps) instrumentality condition. Thus, meaninglessness and experienced boredom seemed to transfer the impact of the boredom induction onto charity intentions, when the instrumentality of the charity was high but not low. While these results are in line with our predictions, we advise caution in interpreting these results given that the sample size is very low for these rather complex mediation models.

Synopsis. Consistent with the hypothesis, we observed the highest level of intended charity support when boredom *and* the instrumentality of charity support were relatively high. Boredom thus promotes prosocial intentions, but only when behaving prosocially is perceived as purposeful. On a more general level these results confirm the assumption that boredom increases behavioral intentions with the potential to re-establish perceived meaningfulness.

Mini Meta-Analysis

Although Experiment 1 and 2 both showed that boredom can promote prosocial intentions, the sample sizes in these two studies were on the low side.[8] We therefore

[8] The reason for this is that these studies were conducted in a period before intensified discussions around the need for larger sample sizes.

conducted a meta-analysis on both samples. We estimated the meta-analytical effect size based on the main effect of boredom on intentional charity support in Experiment 1 [$F(1, 29) = 7.67$, $\eta^2 = .21$, $r = 0.46$] and the high versus low boredom contrast on intentional charity support within the high instrumentality condition of Experiment 2 [$t(81) = 3.88$, $d = 0.86$, $r = 0.40$]. The meta-analysis confirmed a significant and substantial effect of boredom on prosocial intentions, $\bar{N} = 56.60$, $\bar{d} = 0.92$, 95%CI = [0.35; 1.55]. These results further support the notion that boredom does seem to increase people's willingness to help others.

General Discussion

We proposed that people who feel bored show increased prosocial intentions as a potential way to re-establish a sense of meaningfulness. In a Pilot Study we confirmed that boredom is indeed characterized by an elevated search for meaningful engagement. We proposed that the motivation to subsequently re-establish meaning could result in the promotion of responses that are perceived as purposeful—such as prosocial intentions (e.g., Caprara & Steca, 2005; Furrow, King, & White, 2004; Shek, Ma, & Cheung, 1994; see also Heine et al., 2006). The results of Experiment 1 supported this hypothesis: Participants were more willing to give to a charity when they were bored than when they were not bored. Experiment 2 extended and qualified the findings by investigating the strategic component of prosocial intentions as a means for re-establishing a sense of meaningfulness. To this end, we manipulated whether or not charity support was instrumental. The results of this Experiment indicated that prosocial intentions were stronger under boredom, especially when the corresponding prosocial activity was effective and could thus serve as means for establishing perceived meaningfulness, but not when it was ineffective and thus less meaningful. Taken together, these findings support the claim that boredom can promote prosocial intentions, and that this relationship is based on attempts to re-establish a sense of meaning in life.

Contributions and Novelties

Our research contributes to different areas of research: boredom, meaning-regulation, and prosociality. Social psychological research on boredom is still very young and relatively few studies have addressed its consequences. Boredom is linked to self-regulatory strategies of pursuing interesting and fun activities while people engage in boring tasks (e.g., Sansone

et al., 1992; Smith et al., 2009). Our research extends this notion on at least two levels. It demonstrates that the effect of boredom on self-regulation lasts *beyond* the boring activity itself. In the current studies, intentions to donate to charity could *not* have increased the level of stimulation, interest, arousal, novelty, fun, or challenge experienced due to the boring activity simply because the boring activity finished before prosocial behavior was assessed. Therefore, our research shows that boredom affects attitudes and behavior even after the boring activity, if people have not had the chance to re-establish a sense of meaningfulness. In addition, our research demonstrates that the effectiveness of prosocial behavior moderated the prosocial impact that boredom has. This effect can hardly be explained by the assumptions that boredom generally increases engagement in interesting or fun activities, but it is consistent with our hypothesis that boredom promotes behavior that is perceived as purposeful. To be clear, we do not argue that boredom always leads to meaning-regulation attempts. Indeed, our own research (Van Tilburg & Igou, 2012) and that of others (e.g., Dahlen at al., 2004) indicates that sensation seeking (or stimulation/challenge) is common under boredom. However, boredom has a rich array of motivational consequences besides sensation seeking and an important one is the search for meaningful engagement (e.g., Van Tilburg & Igou, 2016).

In addition to the above, our research is novel as it focuses on the 'existential threat' that boredom can impose. An impressive amount of research now charts the effects of existential threats on meaning-regulation—such as mortality salience (e.g., Greenberg et al., 2004), uncertainty (e.g., Van den Bos, 2001), and ostracism (Case & Williams, 2004)—but treating the mundane experience of *boredom* as related to meaning-threats is relatively new. Importantly, people's attempts to attain a sense of meaningfulness affect such a wide area of behaviors and attitudes that Heine and colleagues (2006) referred to the meaning maintenance process as "inexhaustible," "innate," and "automatic" (p. 91). Our finding that the experience of boredom affects meaningful responses is intriguing and holds great potential for understanding how people engage in their 'quest for meaningfulness' on an everyday basis.

Besides the value of our research for the psychology of boredom and meaning-regulation, our research adds to the understanding of the functions that prosociality can

fulfill. Paradoxically, our research shows that the aversive experience of boredom can promote 'positive' social intentions. Being bored may be miserable, but at the same time it may benefit others who are in need of support. This is important as past boredom (proneness) research mainly suggested detrimental correlates such as aggression or pathological gambling. Consistent with past research (Caprara & Steca, 2005; Furrow et al., 2004; Jonas et al., 2002; Shek, et al., 1994; see also Heine et al., 2006; Joireman & Duell, 2005; 2007), our research suggests that one of the values of prosocial intentions lies in its meaning-regulating potential: the corresponding prosocial behavior provides opportunities that may reduce negative consequences of a lack of meaning in life.

Limitations and Future Directions

Past boredom research indicated that components of feeling bored are being unchallenged (e.g., Csikszentmihalyi, 1990), being deprived from stimulation (e.g., Eastwood, Cavaliere, Fahlman, & Eastwood, 2007), or having a lack of interest (e.g., Sansone et al., 1992). Not surprisingly, boredom proneness is related to sensation seeking and this has been offered as a (partial) explanation of the link between boredom proneness and correlates as anger, aggression, and gambling (e.g., Blaszczynski, McConaghy, & Frankova, 1990; Dahlen, Martin, Ragan, & Kuhlman, 2004; Rupp & Vodanovich, 1997). Our research did not specifically focus on the sensation seeking aspect but rather on the meaning re-establishment characteristic of boredom (Van Tilburg & Igou, 2012, 2016). It appears that boredom promotes meaningful responses that do not involve a clear increase in stimulation (e.g., charity support intentions). Nevertheless, by identifying the meaning re-establishment motive associated with boredom we can understand better what *kind* of stimulation is sought when bored. For example, why would people turn to gamble or aggression rather than simply jump in circles as a much easier way of stimulation? This may be because jumping in circles is (for most people) quite meaningless, whereas aggression can sometimes also serve as a source of meaningfulness, for example when intergroup tensions exist (e.g., McGregor, Lieberman, Greenberg, Solomon, Arndt, Simon, & Pyszczynski, 1998; Van Tilburg & Igou, 2011). Regarding gambling, Barbalet suggested that "By focusing their involvement on the positive attributes of betting 'skill' or 'luck', the gambler constructs a meaning over

otherwise empty time" (1999, p. 642). It may hence be that the *specific type* of sensation seeking due to boredom is qualified by a meaning re-establishment motive.

What would happen, on the other hand, when stimulation or challenge and meaning do not coincide? What would happen, for example, if bored people face a choice between relatively meaningful yet under-stimulating activity versus a comparatively meaningless but stimulating activity? Presumably, people's behaviors would reflect whether the sensation seeking or meaning search motive is momentarily dominant. Perhaps, the dominance of either motive depends on factors such as individual differences, such as self-control strength or self-regulatory focus, and context (e.g., whether meaning is very concretely or rather abstractly related to the task, whether people identify with the beneficiary of the behavior, or whether social norms encourage or discourage popping university property). Clearly, this is an empirical question that we cannot fully address yet, but that can and should be investigated in future research.

A limitation of the current two studies as their relatively low sample sizes. Although we performed a confirmatory meta-analysis, future research would do well to investigate the relationship between boredom and prosociality in larger samples, and ideally with behavioral measures complimentary to the behavioral tendency measures presently employed.

Prosociality is not the only consequence of boredom, and also not the only response that follows from boredom's existential qualities. For example, in past research we found that boredom can likewise prompt (meaning laden) nostalgic reverie (Van Tilburg, Igou, & Sedikides, 2013), ingroup favoritism or outgroup derogation (Van Tilburg & Igou, 2011), and affirmation of political ideology (Van Tilburg & Igou, in press). Some research suggests that boredom can even contribute to 'constructing' new meanings by encouraging creative behavior (Gasper & Middlewood, 2014; Mann & Cadman, 2014). In that sense, a prosocial outcome of boredom is not an isolated case of meaning-regulation in response to boredom, and in the presence of alternatives prosocial responses may or may not be the dominant response. This is a facet of boredom that we have not tested yet, but that is worthy of further investigation. What makes prosocial responses to state boredom particularly interesting, we think, is that boredom proneness researchers have found repeatedly that trait boredom

correlates with antisocial behavior (e.g., aggression, hostility; for a review, see Vodanovich 2003). Thus, although unresolved or chronic boredom during life may harm, short term boredom seems to serve more adaptive functions, for better (e.g., prosocial behavior) or worse (e.g., outgroup derogation; Van Tilburg & Igou, 2011a).

Conclusion

Boredom is often considered a nuisance with primarily unpleasant or detrimental outcomes. Out studies suggest that while aversive, boredom can have constructive, positive outcomes: boredom can trigger prosocial intentions that seems to follow from the search for meaningful engagement that characterizes boredom. Our results shed new light on the nature of boredom and moves beyond a 'boredom is good' versus 'boredom is bad' dichotomy to a general sense of 'for better or worse'; that is, boredom needs to be understood as an emotion with its particular set of functions and consequences, with at least some of them being socially desirable.

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Figure 1: Charity Support Intentions as a Function of Boredom and Instrumentality (Experiment 2).