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Late life depression, suicidal ideation, and attempted suicide:

The role of individual differences in maximizing, regret, and negative decision outcomes.

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ABSTRACT

Suicide rates are highest in adults of middle and older age. Research with psychiatric patients has shown that proneness to feel regret about past decisions can grow so intense that suicide becomes a tempting escape. Here, we examine the additional role of individual differences in maximizing, or the tendency to strive for the best decision, rather than one that is good enough. We provided individual-differences measures of maximizing, regret proneness, and negative life decision outcomes (as reported on the Decision Outcome Inventory or DOI) to a non-psychiatric control group, as well as three groups of psychiatric patients in treatment for suicide attempts, suicidal ideation, or non-suicidal depression. We found that scores on the three individual-differences measures were worse for psychiatric patients than for non-psychiatric controls, and were correlated to clinical assessments of depression, hopelessness, and suicidal ideation. More importantly, maximizing was associated with these clinical assessments, even after taking into account maximizers' worse life decision outcomes. Regret proneness significantly mediated those relationships, suggesting that maximizers could be at risk for clinical depression because of their proneness to regret. We discuss the theoretical relevance of our findings and their promise for clinical practice. Ultimately, late-life depression and suicidal ideation may be treated with interventions that promote better decision making and regret regulation.

Keywords: maximizing, regret, decision outcome inventory (DOI), suicide, depression, elderly, decision making

Late life depression, suicidal ideation, and attempted suicide:

The role of individual differences in maximizing, regret, and negative decision outcomes.

Suicide rates increase with age and are highest in adults of middle and older age worldwide (Bertolote & Fleischmann, 2002; Conwell, 2001; McKeown, Cuffe, & Schulz, 2006).

Understanding the psychological risk factors for suicide is important for developing suicide prevention programs. Prospective studies have shown that psychological risk factors for suicide include feelings of depression, hopelessness, and suicidal ideation (Beck, Steer, Kovacs, & Garrison, 1985, 1990; Brown, Beck, Steer, & Grisham, 2000). A meta-analysis has linked depression in later life with the accumulation of stressful life events, such as financial hardship, relationship discord, and poor health (Kraaij, Arensman, & Spinhoven, 2002). Suicidal ideation and suicide attempts may result in part from intense emotional reactions to adverse life events (Conwell, Duberstein, & Caine, 2002; Yip et al., 2003). Indeed, there are profound individual differences in the proneness to feel regret about past decisions and associated adverse life events (Garnefski, Teerds, Kraaij, Legerstee, & van den Kommer, 2004; Roese et al., 2009; Yen & Siegler, 2003; Zeelenberg & Pieters, 2007).

In later life, regret proneness is linked with the perception that there is no time left for any perceived missteps to be corrected (Västfjäll, Peters, & Bjälkebring, 2011; Wrosch & Heckhausen, 2002). Although the majority of older adults may be able to cope with their negative emotions and feelings of regret (Bjälkebring, Västfjäll, & Johansson, 2013; Bruine de Bruin, Strough, & Parker, 2014; Västfjäll, Peters, & Johanson, 2013; Wrosch, Bauer, & Scheier, 2005), suicidal older adults may be the exception (Yip et al., 2003). Baumeister theorized that when feelings of regret and self-blame grow to be unbearable, suicide becomes a tempting escape (Baumeister, 1990).

According to research in judgment and decision making, regret has state and trait dimensions (Zeelenberg & Pieters, 2007). Regret is an emotional state that people may experience when they perceive that an adverse life outcome was caused by their own bad decisions (Zeelenberg & Pieters, 2007). Similarly, the disposition to feel regret, also referred to as regret proneness, is stronger among people who have a tendency to compare their life outcomes to what might have been if only they had made better decisions (Delacroix & Jordan, 2007; Schwartz, Ward, Monterosso, Lyubomirsky, White & Lehman, 2002; Zeelenberg & Pieters, 2007). Such ‘if only...’ counterfactual thinking can help to generate strategies for improving future decisions (Roese, 1997), but can also produce crippling levels of self-blame (Davis, Lehman, Silver, Wortman, & Ellard, 1996). Indeed, victims of traumatic life events report more depression and psychological distress if they are predisposed to such counterfactual thinking (Branscombe, Wohl, Owen, Allison, & N’gbala, 2003; Davis, Lehman, Wortman, Silver, & Thompson, 1995). These findings suggest the importance of understanding the association of regret proneness and related decision styles with the experience of clinical depression – and, possibly, suicidal ideation and behavior.

The present study is the first to test whether these processes lead to such extreme responses as suicidal ideation and behavior, in a sample including depressed psychiatric patients. Specifically, we build on individual-differences studies showing that regret proneness is more common among individuals who aim to maximize (Bruine de Bruin, Parker, & Fischhoff, 2007; Parker, Bruine de Bruin, & Fischhoff, 2007; Schwartz et al., 2002). Maximizing involves systematically comparing options to strive for the best decision (Dar-Nimrod, Rawn, Lehman, & Schwartz, 2009; Schwartz et al., 2002), without necessarily succeeding in doing so (Parker et al., 2007; Polman, 2010). In his classic work, Simon (1955, 1956) notes that the costs of

maximizing may outweigh the expected benefits, when making decisions that involve a large number of similar options, time pressure, unclear goals, other complexities, or limited cognitive ability (Payne, Bettman, & Johnson, 1993). In those cases, it may be preferable to satisfice, or choose an option that is good enough.

However, it is important to note that the extent to which maximizers are prone to feelings of regret may depend on how maximizing is defined. Schwartz et al.'s (2002) individual-differences scale of maximizing has three main components (Nenkov, Morrin, Ward, Schwartz, & Hulland, 2008): (a) the dysfunctional tendency to increase decision difficulty by seeking the very best decision outcome even when that may not be possible; (b) the dysfunctional tendency to persist in a search for alternatives, even after experiencing good outcomes; and (c) the functional tendency of applying high standards when making decisions. Only decision difficulty and alternative search have been associated with regret proneness (Nenkov et al., 2008; see also Highhouse, Diab, & Gillespie, 2008), with the former seeming to be the main culprit (Lai, 2010).

To date, it also remains unclear how dysfunctional maximizing (and its components) can be. Because maximizing increases proneness to regret (Schwartz et al., 2002; Zeelenberg & Pieters, 2007), it is possible that maximizers are at risk for experiencing clinical levels of depression or suicide. If so, assessments of maximizing and regret proneness could potentially be relevant for understanding an important public health problem. However, studies of individual differences in decision making have mostly focused on college student samples, with some including convenience samples of community-dwelling adults (e.g., Highhouse et al., 2009; Lai, 2010; Nenkov et al., 2008; Schwartz et al., 2002; Parker et al., 2007; Polman, 2010; Zeelenberg & Pieters, 2007). Individual differences in maximizing and regret proneness have

not been examined at the extremes, thus leaving their potential relevance to understanding clinical depression and suicidality unexplored.

Another research question that has remained unanswered is whether the regret proneness associated with maximizing may partially be due to maximizers obtaining worse decision outcomes. Higher scores on Schwarz et al.'s (2002) individual-differences scale of maximizing have been associated with worse decision outcomes, suggesting that maximizers fail to achieve the perfect maximization that they seek (Parker et al., 2007).¹ These negative life decision outcomes were reported on the Decision Outcome Inventory, which includes adverse life events that are somewhat controllable and therefore partly due to bad decisions (such as going to jail; Bruine de Bruin et al., 2007; Parker, Bruine de Bruin, & Fischhoff, in press). Yet, even when maximizers obtain relatively good decision outcomes, they feel dissatisfied because they keep questioning whether they could have done better (Iyengar et al., 2006; Lai, 2011; Sparks et al., 2011). If so, maximizing should be related to regret proneness, and possibly to regret-induced depression and suicidality, even after controlling for maximizers' life decision outcomes.

Here, we provided individual differences measures of dysfunctional decision making including maximizing, regret proneness, and life decision outcomes, to a sample of psychiatric patients and non-psychiatric controls. Specifically, we recruited three depressed groups of psychiatric patients (suicide attempters, suicidal ideators, and depressed non-suicidal individuals) as well as non-psychiatric controls. Our specific research questions were as follows:

1. As compared to non-psychiatric controls, do patients with depression and suicidal thoughts or behavior display more maximizing, regret proneness, and negative life decision outcomes?

2. Are individual-differences measures of maximizing, regret proneness, and life decision outcomes correlated with severity of depression, hopelessness and suicidal ideation?
3. Is maximizing related to regret proneness, after taking into account negative life decision outcomes?
4. Is maximizing indirectly related to clinical measures of depression, hopelessness and suicidal ideation, through its relationship with regret proneness (after taking into account negative life decision outcomes)?

METHOD

Sample.

Participants were recruited for a study of risks and protective factors for suicide in older adults. Informed consent was obtained from all participants and the study was approved by the University of Pittsburgh Institutional Review Board. Our measures were completed by 47 patients who had a verified history of at least one suicide attempt (mean number=1.63, SD=.93; range 1-4), 25 patients who had no history of suicide attempts but contemplated suicide with a specific plan severe enough to require psychiatric hospitalization or outpatient care, 42 patients who were in care for diagnosed depression but had no suicidal ideation or previous suicide attempts, and 22 non-psychiatric controls from primary care practices and self-referrals.² All participants screened negative for symptoms of dementia, and had no history of organic brain disease, delirium, psychosis, mania, or sensory disorders that preclude neuropsychological assessment.

Across groups, participants were of middle to old age (mean years=64.39, SD=8.60; range 43-90), including 49.3% men, 87.5% whites, and 24.1% with a college education. There

were no group differences in terms of gender, race, or education ($p > .10$). We did find a small significant group difference in age, $F(3, 135) = 3.48$, $p < .05$, with average age being 61.28 (SD=7.95) for suicide attempters, 64.16 (SD=9.04) for suicidal ideators, 67.40 (SD=6.13) for non-suicidal depressed patients, and 65.55 (SD=11.37) for non-psychiatric controls.³ Age was also negatively correlated with clinical assessments of depression ($r = -.21$, $p < .01$), hopelessness ($r = -.30$, $p < .001$), and suicidal ideation ($r = -.24$, $p < .01$), as well as individual-differences measures of regret proneness ($r = -.20$, $p < .05$) and negative life decision outcomes as reported on the Decision Outcome Inventory or DOI ($r = -.34$, $p < .05$). Maximizing and its components were not significantly correlated to age ($p > .10$), but the tendency to persist in searching for alternatives did show a marginal correlation ($r = -.17$, $p = .05$). Our main analyses control for age, but our main conclusions were not affected by doing so (see Table 1; Tables 3-4).

Most importantly, we succeeded in recruiting participants who varied on established clinical measures that are further described below. As seen in Table 1, we found significant group differences in depression, $F(3, 131) = 86.38$, $p < .001$, hopelessness, $F(3, 131) = 31.98$, $p < .001$, and suicidal ideation, $F(3, 131) = 114.92$, $p < .001$. Specifically, the three groups of depressed psychiatric patients were significantly worse off than the non-psychiatric controls, in terms of depression, hopelessness, and suicidal ideation. According to each of these measures, the two suicidal groups felt worse than the non-suicidal depressed patients, and the suicide attempters felt worse than the suicidal ideators.

Procedure.

Clinical assessments. We included three established clinical measures of depression, hopelessness, and current suicidal ideation, which have been found to predict later suicide

attempts in psychiatric outpatients (Brown et al., 2000).⁴⁻⁵ First, a trained clinician interviewed participants to evaluate the severity of their depression on Hamilton's (1960) 17-item report, which, among other things, includes depressed mood, anxiety, insomnia, and somatic symptoms. Summed ratings can range from 0 to 52, with higher scores reflecting more severe depression. Second, participants self-reported their feelings of hopelessness on an established scale (Beck, Weissman, Lester, & Trexler, 1974). They answered 20 true-false statements that were originally developed from clinical observations of suicidal patients (e.g., "I might as well give up because I can't make things better for myself"). Summed scores can range from 0-20, with higher scores reflecting more intense hopelessness. Third, a 19-item clinician-report was used to evaluate the severity of participants' suicidal thoughts and wishes (Beck, Kovacs, & Weissman, 1979). Each item involved three choices that ranged from 0 (least severe) to 2 (most severe). The summed score can range from 0 to 38, with higher scores indicating more severe suicidal ideation.

Maximizing and its components. Participants rated their agreement with the 13 statements on Schwartz et al.'s (2002) validated maximizing scale (1=strongly disagree; 5=strongly agree). As mentioned, the scale covered three components of maximizing (Nenkov et al., 2008), with six items assessing the dysfunctional tendency to create decision difficulty through excessive maximizing (e.g., "Renting videos is really difficult. I'm always struggling to pick the best one"), and four items assessing the dysfunctional tendency to continually search for alternatives even after experiencing good outcomes (e.g., "No matter how satisfied I am with my job, it's only right for me to be on the lookout for better opportunities"), as well as three items assessing the relatively functional tendency of having high standards (e.g., "I never settle for second best"). Internal consistency was sufficient for the overall maximizing scale ($\alpha=.74$), but varied for the component scales ($\alpha=.73$ for decision difficulty; $\alpha=.65$ for alternative search;

$\alpha=.52$ for high standards). Overall maximizing and component scores were averaged across ratings, and could range from 0-5, with higher scores reflecting stronger tendencies. Correlations between overall maximizing and its component scores appear in Table 2.

Regret proneness. We provided participants with the established 5-item individual-differences measure developed by Schwartz and colleagues (e.g., “When I think about how I’m doing in life, I often assess opportunities I have passed up”) which in non-clinical samples has been associated with maximizing (Parker, Bruine de Bruin, & Fischhoff, 2007; Schwartz et al., 2002; Zeelenberg & Pieters, 2007). The response scale ranged from 1 (=completely disagree) to 5 (=completely agree). Internal consistency (α) across items was .66. Overall scores were reflected in the averaged rating.

Negative life decision outcomes (on Decision Outcome Inventory or DOI). Participants completed Bruine de Bruin et al.’s (2007) Decision-Outcome Inventory (DOI), scores on which have been related to more maximizing and worse decision-making competence in community-dwelling adults even after controlling for other attributes such as socio-economic status, fluid cognitive ability and decision styles (Bruine de Bruin et al., 2007; Parker et al., 2007; Parker et al., in press). In the original scale, participants reported whether or not they had experienced 41 negative life decision outcomes in the past 10 years, across interpersonal, financial, professional, and health domains. All of these negative outcomes were relatively controllable and, presumably, indicative of the absence of good decisions. Because of the potentially cumulative nature of regrets, we asked participants to report these outcomes for their lifetime.⁶ We also removed 5 items that seemed inappropriate for our sample of older adults (e.g., been suspended from school, had an unplanned pregnancy), while adding one that seemed appropriate (i.e., drawn on your retirement savings before the age of 59 ½). For 32 of the life decision outcomes,

participants first indicated whether they had had the opportunity to experience it (e.g., having had a mortgage or loan) and then whether they had the negative outcome (e.g., having a mortgage or loan foreclosed). Internal consistency was sufficient across the reported outcomes ($\alpha=.79$). Because items cover negative outcomes that vary from relatively mundane to more severe, the overall DOI score weights each negative outcome by its severity, defined as the percent of participants in the sample who reported not experiencing it (assuming that more severe outcomes are less frequent.)

Analysis plan. To examine the first research question, we conducted separate Analyses of Variance (ANOVA) to examine group differences (suicide attempters, suicidal ideators, non-suicidal depressed, and non-psychiatric controls) in maximizing and its components, regret proneness, and life decision outcomes, while controlling for group differences in age. Each ANOVA included a set of three Helmert contrasts, with the main one comparing the three groups of depressed psychiatric patients (suicide attempters, suicidal ideators, non-suicidal) with the non-psychiatric controls. The additional two contrasts compared the two groups of suicidal patients with the depressed non-suicidal patients, and the suicide attempters with the suicidal ideators. Findings are reported in Table 1. To examine the second research question, we computed Pearson correlations between the individual-differences measures of maximizing and its components, regret proneness, and life decision outcomes with the clinical measures of depression, hopelessness, and suicidal ideation (Table 2). To examine the third research question, we computed linear regressions that predicted the three clinical measures, from maximizing and negative life decision outcomes (step 1), as well as regret proneness (step 2). We computed two sets of these regression analyses, considering overall maximizing (Table 3) or maximizing components (Table 4). To examine the fourth research question, we conducted

bootstrapping mediation tests to examine whether maximizing and its components statistically contributed to the three clinical measures of depression, hopelessness and suicidal ideation through their relationship with regret proneness, while taking into account negative life decision outcomes as well as age (Preacher & Hayes, 2008).

RESULTS

1. As compared to non-psychiatric controls, do patients with depression and suicidal thoughts or behavior display more maximizing, regret proneness and negative life decision outcomes?

ANOVAs showed significant group differences in overall maximizing, $F(3,131)=3.05$, $p<.05$, regret proneness, $F(3, 131)=7.78$, $p<.001$, and negative life decision outcomes as reported on the DOI, $F(3,131)=3.05$, $p<.05$. When considering maximizing aspects, group differences emerged for the dysfunctional tendency to maximize to the extent that it creates decision difficulty, $F(3, 131)=2.68$, $p<.05$, with marginal group differences in the dysfunctional tendency to search for alternatives when it is no longer needed, $F(3, 131)=2.38$, $p=.07$, and no significant group differences in the functional tendency to have high standards, $F(3, 131)=.11$, $p=.96$.

As expected, Helmert contrasts showed that the three groups of depressed psychiatric patients were significantly worse than the non-psychiatric controls in terms of overall maximizing, regret proneness, and negative life decision outcomes (DOI). This group difference also emerged for maximizing components, including decision difficulty while maximizing, and alternative search while maximizing. Furthermore, the two depressed suicidal groups reported significantly worse regret proneness than did the non-suicidal depressed patients, while not being significantly different from each other.

2. Are individual-differences measures of maximizing, regret proneness, and life decision outcomes correlated with severity of depression, hopelessness and suicidal ideation?

As expected, individual-differences measures of maximizing and its dysfunctional components, regret proneness, and negative life decision outcomes were all associated with worse scores on the clinical measures of depression, hopelessness, and suicidal ideation (Table 2) – with one exception. The exception was that maximizing was not correlated to suicidal ideation, and neither were its components.

3. Is maximizing related to regret proneness, after taking into account negative life decision outcomes?

The first model in Table 3 shows that overall maximizing contributes to regret proneness even after taking into account that maximizers experience worse life decision outcomes. Moreover, both overall maximizing and having experienced more negative life decision outcomes (DOI) had independent positive relationships with regret proneness. The first model in Table 4 is equivalent, but replaces the overall measure of maximizing with its three components. It shows that the association between overall maximizing and regret proneness largely reflects the dysfunctional tendency to maximize to the extent that it makes decisions difficult.

4. Is maximizing indirectly related to clinical measures of depression, hopelessness and suicidal ideation, through its relationship with regret proneness (after taking into account negative life decision outcomes)?

Table 3 shows that overall maximizing was significantly related to depression, even after taking into account maximizers' worse life decision outcomes. After additionally controlling for

regret proneness, overall maximizing was marginally related to depression. Bootstrapping tests (Preacher & Hayes, 2008) showed independent mediation effects. That is, maximizing was indirectly associated with depression through its relationship with regret proneness, independent of negative life decision outcomes as reported on the DOI (95% CI=.44, 2.97 without controlling for age; 95% CI=.43, 2.87 when controlling for age). Additionally, negative life decision outcomes showed an indirect association with depression through regret proneness, independent of maximizing (95% CI=2.73, 18.74 without controlling for age; 95% CI=2.40, 16.16 when controlling for age).

Similar patterns were seen in linear regressions predicting the clinical measures of hopelessness and suicidal ideation, with regret proneness being the consistent independent predictor (Table 3). Significant mediation analyses showed that maximizing had an indirect association with hopelessness through its relationship with regret proneness, independent of negative life decision outcomes (95% CI=.07, 1.99 without controlling for age; 95% CI=.10, 2.02 when controlling for age). A similar mediation path was significant for suicidal ideation (95% CI=.30, 3.53 without controlling for age; 95% CI=.20, 3.50 when controlling for age). Significant mediation analyses also showed that negative life decision outcomes (DOI) had an indirect association with hopelessness through its relationship with regret proneness, independent of maximizing (95% CI=.96, 12.86 without controlling for age; 95% CI=.65, 11.15 when controlling for age). Again, a similar mediation path was significant for suicidal ideation (95% CI=2.75, 21.64; without controlling for age; 95% CI=2.05, 20.58 when controlling for age).

Table 4 shows equivalent linear regressions predicting depression, hopelessness, and suicidal ideation, while replacing the overall measure of maximizing with its three components. The reported findings suggest the important role of the dysfunctional tendency to maximize to

the extent that it makes decisions difficult. After taking into account regret proneness, it again remained the sole independent predictor of all three clinical measures. Bootstrapping tests (Preacher & Hayes, 2008) showed that decision difficulty while maximizing was indirectly correlated to each of the three clinical measures through its relationship with regret proneness, independent of the other maximizing components and negative life outcomes. Specifically, a similar significant mediation pattern was seen for depression (95% CI=.19, 1.71 without controlling for age; 95% CI=.21, 1.79 when controlling for age), hopelessness (95% CI=.04, 1.20 without controlling for age; 95% CI=.01, 1.14 when controlling for age), and suicidal ideation (95% CI=.14, 2.09 without controlling for age; 95% CI=.08, 1.99 when controlling for age).

DISCUSSION

Research in judgment and decision making suggests that striving to maximize while making decisions increases proneness to experiencing regret, in samples of students and community-dwelling adults (Parker et al., 2007; Schwartz et al., 2002; Zeelenberg & Pieters, 2007). As a result of their regret, maximizers could be at risk for clinical depression or suicide. Indeed, clinical studies have pointed to the important role of regret in late life depression and suicidal ideation, as well as the adverse life outcomes that are the focus of that regret (Baumeister, 1990; Kraaij et al., 2002; Conwell et al., 2002; Yip et al., 2003). However, previous work left questions about how dysfunctional maximizing (and its components) can be. Maximizing, regret proneness, and life decision outcomes had never been assessed in clinical samples. Thus, it remains unclear whether the relationship between maximizing and regret proneness is generalizable to psychiatric patients, or whether it is relevant to understanding their clinical depression and suicidality. Here, we reported four novel findings from a clinical study

that included suicide attempters, suicidal ideators, non-suicidal depressed patients, and non-psychiatric controls.

Our first research question focused on differences between non-psychiatric controls and psychiatric patients with depression and suicidal thoughts or behavior. We found that the psychiatric patients engaged more in maximizing, experienced more negative life decision outcomes, and were more prone to regretting their decisions. Thus, these commonly used measures of decision making can to some extent capture psychiatric extremes. However, suicide attempters and suicidal ideators showed similarly poor scores on these measures, suggesting that their problems with decision making were equally serious.

In response to our second research question, we found that individual-differences measures of maximizing, regret, and life decision outcomes were significantly correlated to severity of depression, hopelessness and suicidal ideation. Together, this set of correlations suggests that a dispositional style characterized by maximizing and proneness to regret as well as poor real-life decision outcomes is associated with extreme degrees of emotional distress.

Third, maximizing was significantly correlated to regret proneness, even after taking into account that maximizers also experience worse negative life decision outcomes. Indeed, maximizers are even prone to feelings of regret about good decision outcomes, because they keep thinking they could have done better (Iyengar et al., 2006). It has also been suggested that their constant questioning leads maximizers to avoid commitment to their choices, which then promotes further dissatisfaction (Lai, 2011; Sparks et al., 2011).

Fourth, our mediation analyses suggested that maximizing was indirectly related to severity of depression, hopelessness and suicidal ideation, through its relationship with regret proneness (after taking into account negative life decision outcomes). In non-clinical samples,

the relationship of maximizing with regret had already been noted (Parker et al., 2007; Schwartz et al., 2002; Zeelenberg & Pieters, 2007), but our findings link maximizers' regret to extreme negative subjective experiences that manifest in late-life depression, hopelessness, and suicidal ideation. Thus, it is possible that maximizers develop a need for psychiatric treatment because of their proneness to regret.

As in non-clinical samples, not all maximizing components were dysfunctional (Nenkov et al., 2008; see also Highhouse et al., 2008). Even in psychiatric patients, the tendency to have high standards while maximizing was not actually associated with negative experiences or emotional states. The negative experiences associated with maximizing seemed mostly driven by the tendency to maximize to the extent that it creates decision difficulty (Nenkov et al., 2008).

As with any study, ours had limitations. First, the correlational nature of our analyses precludes causal conclusions. A correlation between a measure of dysfunctional decision making and a clinical assessment of depression may indicate that dysfunctional decision making caused depression, that depression caused dysfunctional decision making, or that a third variable caused both. Second, our analyses included self-report measures of maximizing, regret, and decision outcomes. Depressed psychiatric patients have a tendency to ruminate about the negative, perhaps resulting in exaggerated self-reports of their decision dysfunction and hardships.

If our correlational findings reflect causal effects on experiences and behaviors, existing measures of dysfunctional maximizing, regret proneness, and negative life decision outcomes show promise for use in clinical practice. They could be developed into clinical measures, so as to identify patients with extreme maximizing tendencies, regret proneness, or negative life decision outcomes that are in need of intervention. Moreover, these measures could also be used

to evaluate the effectiveness of treatments that aim to modify dysfunctional decision making. Indeed, decision research with non-clinical samples has suggested the promise of interventions that aim to promote better decision making: Decision-making competence can be taught, as shown in a recent prospective study with high-school students (Jacobson et al., 2012).

Such interventions could be augmented with strategies for reducing maximizing and regret. According to recent reviews (Schwartz & Ward, 2004; Västfjäll et al., 2011; Zeelenberg & Pieters, 2007), some promising strategies may include (1) choosing to satisfice rather than maximize, so as to make decisions easier and reduce their psychological costs; (2) choosing not to track foregone options once a decision is made, so as to prevent regret; (3) focusing on ways life could have been worse rather than better than it is now, so as to promote gratitude; and (4) recognizing the role of chance in experienced decision outcomes, so as to reduce self-blame. Thus, well-being may not only be improved by making better decisions but also by challenging negative cognitions about decisions (Brown et al., 2005; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Roese et al., 2009). Following Jacobson et al. (2012), prospective studies are needed in which participants are randomly assigned to different interventions and followed over time to examine effects on maximizing behavior, decision outcomes, and experienced regret, as well as on depression, suicidal thoughts, and suicidal behaviors. Ultimately, decision-making interventions may show promise for use in psychotherapy for depression and suicide prevention.

FOOTNOTES

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- ¹ An alternative scale that conceptualized maximizing more narrowly as the tendency to have high standards does not replicate these findings (Highhouse et al., 2008). The items on this alternative scale overlap with some of the Schwartz et al. (2002) items.
- ² Our participants were part of an ongoing longitudinal study on late-life suicide. After the study had already commenced, we received additional funding to introduce individual-differences measures of decision making, including maximizing, regret, and decision outcomes (DOI). A total of 53 participants have therefore not received the relevant measures needed for inclusion into our analyses. The group status of these 53 participants is not significantly different from the group status of the 136 included participants (suicide attempters, suicidal ideators, non-suicidal depressed, or non-psychiatric controls).
- ³ An anonymous reviewer noted that these age differences may potentially reflect that some suicide attempters will, unfortunately, be successful.
- ⁴ We also recorded worst lifetime suicidal ideation, which was significantly correlated to current suicidal ideation ($r=.92, p<.001$).
- ⁵ Although diagnoses of depression and suicidal ideation severity are typically based on face-to-face interviews with trained clinicians, reliable self-report instruments can be used to augment clinician reports (Enns, Larsen, & Cox, 2000; Kaplan, Asnis, Sanderson, Keswani, De Lecuona, & Joseph, 1994; Uher et al., 2012; Yigletu, Tucker, Harris, & Hatlevig, 2004).
- ⁶ Participants also reported the DOI outcomes for the past ten years. The ten-year DOI score was significantly correlated to the lifetime DOI score ($r=.78, p<.001$). The overall conclusions of this paper were not affected by our choice of DOI measure.

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Table 1: Scores by group.

	Depressed psychiatric patients			Non-psychiatric controls
	Suicide attempters	Suicidal ideators	Non-suicidal	
Clinical assessments				
Depression (-)	22.36 (6.09)	22.52 (5.95)	16.36 ^s (4.21)	2.23 ^d (2.20)
Hopelessness (-)	13.28 (6.01)	13.68 (6.07)	7.21 ^s (5.20)	.95 ^d (1.09)
Suicidal ideation (-)	21.64 (8.10)	14.32 ^a (8.01)	.02 ^s (.15)	.05 ^d (.21)
Decision-making measures				
Overall maximizing (-)	2.79 (.69)	2.94 (.55)	2.75 (.65)	2.41 ^d (.45)
Decision difficulty (-)	2.77 (1.12)	2.86 (.89)	2.75 (1.07)	2.11 ^d (.78)
Alternative search (-)	2.55 (.89)	2.76 (.77)	2.46 (.79)	2.13 ^d (.57)
High standards (+)	3.31 (.90)	3.41 (.77)	3.33 (.59)	3.35 (.78)
Regret proneness (-)	3.25 (.84)	3.49 (.70)	2.94 ^s (.57)	2.53 ^d (.65)
Life DOI (-)	.16 (.11)	.17 (.10)	.12 (.07)	.09 ^d (.08)

Note: Higher scores indicate worse experiences (-), or better experiences (+). Helmert contrasts tested group differences while controlling for age, with a=ideators significantly different from attempters, s=non-suicidal patients significantly different from two suicidal patient groups; d=non-psychiatric controls significantly different from three patient groups ($p < .05$). Analyses controlled for age.

Table 2: Pearson correlations.

	Depression (-)	Hope- lessness (-)	Suicidal ideation (-)	Overall Maximizing (-)	Decision difficulty (-)	Alternative search (-)	High standards (+)	Regret proneness (-)
Depression (-)	-							
Hopelessness	.56 ^{***}	-						
Suicidal ideation (-)	.55 ^{***}	.50 ^{***}	-					
Overall maximizing (-)	.30 ^{***}	.18 [*]	.08	-				
Decision difficulty (-)	.28 ^{***}	.23 ^{**}	.05	.78 ^{***}	-			
Alternative search (-)	.26 ^{**}	.12	.11	.84 ^{***}	.42 ^{***}	-		
High standards (+)	.03	-.04	-.04	.43 ^{***}	.14	.15 ⁺		
Regret (-)	.42 ^{***}	.30 ^{***}	.27 ^{**}	.41 ^{***}	.42 ^{***}	.36 ^{***}	-.04	-
Life DOI (-)	.29 ^{***}	.19 [*]	.19 [*]	.21 [*]	.13	.30 ^{***}	-.10	.40 ^{***}

Note: Higher scores indicate worse experiences (-), or better experiences (+). DOI=decision outcome inventory.

*** p<.001; ** p<.01; * p<.05; + p<.10

Table 3: Linear regressions predicting individual differences in regret proneness and clinical assessments, focusing on overall maximizing.

	Regret proneness	Clinical assessments					
		Depression		Hopelessness		Suicidal ideation	
Regret proneness (-)	-	-	.30**	-	.23*	-	.26*
Overall maximizing (-)	.34***	.25**	.15 ⁺	.14 ⁺	.06	.03	-.05
Negative life outcomes on DOI (-)	.31***	.21*	.12	.10	.02	.11	.04
R ²	.27	.15	.22	.09	.13	.08	.12
Model statistic	F(3,135)= 16.45***	F(3,132)= 8.01***	F(4,131)= 9.12***	F(3,132)= 4.45**	F(4,131)= 4.95**	F(3,132)= 3.90**	F(4,131)= 4.52**

Note: Higher scores indicate worse experiences (-). All models controlled for age. Estimates are standardized (β). DOI=decision outcome inventory.

*** p<.001; ** p<.01; * p<.05; ⁺ p<.10

Table 4: Linear regressions predicting regret proneness and clinical assessments, focusing on maximizing components.

	Regret	Clinical assessments					
		Depression		Hopelessness		Suicidal ideation	
Regret proneness (-)	-	-	.29**	-	.20*	-	.24*
Decision difficulty while maximizing (-)	.34***	.21*	.12	.23*	.17 ⁺	.01	-.07
Alternative search while maximizing (-)	.14 ⁺	.09	.05	-.03	-.06	.05	.01
High standards while maximizing (+)	-.08	.01	.03	-.04	-.03	-.03	-.01
Negative life outcomes on DOI (-)	.29***	.20*	.12	.10	.04	.10	.03
R ²	.32	.16	.22	.12	.15	.08	.12
Model statistic	F(5,130)= 12.20***	F(5,130)= 5.08***	F(6,129)= 6.05***	F(5,130)= 3.58**	F(6,129)= 3.74**	F(5,130)= 2.36*	F(6,129)= 3.03**

Note: Higher scores indicate worse experiences (-), or better experiences (+). All models controlled for age. Estimates are standardized (β). DOI=decision outcome inventory.

*** p<.001; ** p<.01; * p<.05; ⁺ p<.10