



ELSEVIER

Available online at www.sciencedirect.com

 ScienceDirect

Personality and Individual Differences 42 (2007) 665–675

PERSONALITY AND
INDIVIDUAL DIFFERENCES

www.elsevier.com/locate/paid

Dispositional anxiety and risk-avoidant decision-making

Jon K. Maner^{*}, J. Anthony Richey, Kiara Cromer, Mike Mallott,
Carl W. Lejuez, Thomas E. Joiner, Norman B. Schmidt

Department of Psychology, Florida State University, Tallahassee, FL 32306-1270, USA

Received 19 April 2006; received in revised form 13 July 2006; accepted 1 August 2006
Available online 17 October 2006

Abstract

Three studies investigated the link between dispositional anxiety and the tendency to engage in risk-avoidant decision-making. Findings suggest that dispositional anxiety is associated with a pronounced bias toward making risk-avoidant choices. Individual differences in trait anxiety, worry, and social anxiety were each associated with risk-avoidance on a behavioral risk-taking task (Studies 1 and 2). Compared with other clinical patients (e.g., mood disorders) and non-clinical controls, anxiety disordered patients exhibited substantially greater risk-aversion (Study 3). Findings suggest that the relationship with risk-avoidance is specific to anxiety, and is not merely concomitant to the experience of negative affect. This research has implications for understanding the links between individual differences in affective processing and basic decision-making processes.

© 2006 Elsevier Ltd. All rights reserved.

Keywords: Risk-taking; Anxiety; Social anxiety; Decision-making; Emotion

1. Introduction

Risk decision-making is the process of making choices with potential for either positive or negative outcomes. For example, choosing to start a conversation with a stranger could result in a new friendship or it could result in rejection, depending upon the stranger's reaction. Research

^{*} Corresponding author. Tel.: +1 850 645 1409; fax: +1 850 644 7739.
E-mail address: maner@psy.fsu.edu (J.K. Maner).

suggests large and stable individual differences in the tendency to seek versus avoid risky choices (e.g., Levin & Hart, 2003), wherein risk-taking and related decision-making processes reflect underlying dispositional qualities that vary across individuals.

Evidence also suggests that decision-making can be profoundly shaped by emotional experiences (e.g., Loewenstein, Weber, Hsee, & Welch, 2001). Emotions such as fear, disgust, and anger, for example, have been shown to guide choice (e.g., Lerner & Keltner, 2001). Thus, there are reasons to suspect that risk decision-making may be linked to individual differences in affective processing and the tendency to experience particular affective states. The current research was designed to investigate one important and pervasive form of negative affect – anxiety – in order to evaluate the extent to which it might underlie individual differences in risk-avoidant decision-making.

1.1. Anxiety and risk-avoidant decision-making

Individual differences in the tendency to experience particular emotions can play a strong role in shaping cognitive processes associated with decision-making (e.g., Lerner & Keltner, 2000). Emotions serve as salient forms of information, signaling the presence of particular threats to be avoided or rewards to be acquired (Schwarz & Clore, 1983; Shackelford, LeBlanc, & Drass, 2000). Emotions, in turn, promote cognitive responses facilitating the avoidance of threat and the acquisition of rewards (e.g., Maner et al., 2005). With respect to decision-making, some emotions (e.g., anger) promote decision-making biases that increase one's tolerance for risk, whereas other emotions (e.g., disgust) promote decision-making processes associated with risk-avoidance (Fessler, Pillsworth, & Flamson, 2004).

There are reasons for hypothesizing a link between anxiety and basic forms of risk-avoidant decision-making. Anxiety signals the presence of potential threat and promotes psychological responses that help individuals reduce their vulnerability to threat (Barlow, 1988; Butler & Mathews, 1987). Because threat avoidance has been implicated as a core component of risk-avoidant decision-making, we hypothesize that individuals high in dispositional anxiety would be especially likely to exhibit pronounced forms of risk-avoidant decision-making.

Another reason to think that anxiety is associated with risk-avoidant decision-making is that anxiety promotes pessimistic appraisals of future events (Savitsky, Medvec, Charlton, & Gilovich, 1998; Shepperd, Grace, Cole, & Klein, 2005). Individuals with high trait anxiety, for example, report heightened perceptions of negative outcomes, across a range of behavioral contexts (e.g., Lerner & Keltner, 2000; Maner & Schmidt, 2006; see also Stöber, 1997). The pessimistic outcome appraisals of anxious individuals often focus on their own anticipated emotions – anxious individuals typically anticipate high levels of distress given the occurrence of a negative event (Gasper & Clore, 1998). Such appraisals play an integral role in guiding choice, as decisions are often viewed in terms of their potential to cause strong negative emotions (e.g., Mellers, Schwartz, Ho, & Ritov, 1997).

1.2. The current research

Although studies have provided evidence for links between anxiety and risk-avoidant appraisal processes (e.g., Lerner & Keltner, 2000), few studies have systematically examined the extent to which anxiety is related to risk-avoidant decision-making. The current studies therefore were de-

signed to extend previous research on anxiety and decision-making in three ways. First, we conducted two studies involving a behavioral decision-making task that taps the basic propensity to make risky decisions. We examined the relationship between risk-avoidant decision-making and both social anxiety (Study 1) and trait anxiety (Study 2).

Second, we examined the propensity to make risk-avoidant decisions among individuals with very high (i.e., clinically diagnosable) levels of anxiety (Study 3). While previous studies of affect and decision-making have focused on individual differences present in the normal population, few studies have examined anxious populations in the extreme range.

Third, while some previous studies suggest a link between anxiety and risk-avoidance (e.g., Raghunathan & Pham, 1999), few studies have attempted to rule out the possibility that this link is specific to anxiety, rather than being merely concomitant to the presence of negative affect. Clark and Watson's (1991) tripartite model implies that whereas anxiety has in common with depression and other forms of negative mood a component of negative affect, anxiety also has a unique component that is distinct from negative affect (e.g., typically conceptualized as physiological hyperarousal or anxiety sensitivity; Joiner et al., 1999). As a result, studies aimed at examining the specificity of anxiety-related phenomena often control for negative affect (e.g., Hayward, Killen, Kraemer, & Taylor, 2000). Because research suggests a link between depression and risk-avoidance (Allen & Badcock, 2003), we attempted to rule out the possibility that any links between anxiety and risk-avoidant decision-making might be attributable simply to the presence of negative affect, rather than being specific to anxiety (Studies 2 and 3).

2. Study 1

Study 1 utilized a behavioral decision-making task to test the hypothesized relationship between risk-avoidant decision-making and social anxiety. We examined social anxiety primarily because it is a form of anxiety frequently observed in a normative university population.

2.1. Method

2.1.1. Participants

One hundred thirty-eight undergraduates (39 men, 99 women) participated in exchange for course credit.

2.1.2. Assessment of social anxiety

Social anxiety was assessed with the fear of negative evaluation scale (FNE; Leary, 1983). The FNE assesses the anxious anticipation of negative social evaluation (e.g., "I am afraid that people will find fault with me," "I am usually worried about the kind of impression I make.") The FNE has demonstrated good internal consistency, as well as convergent and discriminant validity (e.g., Leary, 1983) ($\alpha = 0.96$).

2.1.3. Risk decision-making task

Participants performed the balloon analog risk task (BART). The BART is a computer task that serves as a behavioral index of basic risk decision-making. Lejuez et al. (2003, 2002) reported

favorable convergent and discriminant properties of the BART, indicating convergence with other indices of risk-taking (e.g., gambling), and divergence from impulsivity and anxiety-relevant variables such as anxiety sensitivity. In the BART, participants accumulated rewards by blowing up 15 virtual balloons (by clicking a mouse). For each pump, participants earned a point toward rewards of increasing value (raffle tickets for \$5, \$10, \$25, and \$50 drawings). Each balloon had an explosion threshold that varied from balloon to balloon and which, if reached, resulted in the loss of all points for that balloon. Therefore, in deciding whether to make each pump, participants weighed the potential gain against the potential risk of losing all money for that balloon. BART performance provides a more valid and generalizable assessment of risk decision-making than many other standard risk-taking tasks (Lejuez et al., 2002). As in previous research, the average number of pumps per unexploded balloon served as the primary dependent variable.

2.2. Results and discussion

Consistent with predictions, social anxiety was correlated with risk-avoidant decision-making on the BART, $r = -.20$, $p = 0.02$, suggesting that social anxiety is linked to a basic tendency to engage in risk-avoidant decision-making. Although the magnitude of this relationship was only in the small-to-medium range, it should be noted that the range of anxiety in this sample was relatively low; the mean level of social anxiety was 2.74 ($SD = 1.05$) on a 5-point scale. One might expect to see a relatively stronger relationship between anxiety and risk-avoidance in a sample exhibiting greater levels of anxiety (see Study 3).

3. Study 2

Study 1 provided an opportunity to evaluate the relationship between risk-avoidance and a specific form of anxiety (social anxiety). However, we wanted to ensure that these results would generalize to a more global form of anxiety. We also wanted to rule out the possibility that the relationship between anxiety and risk-avoidance might be attributable to their shared association with negative affect. In Study 2, therefore, we examined the relationships between global anxiety constructs (trait anxiety and worry) and risk-avoidant decision-making. To evaluate the specificity of these relationships, we examined the possibility that they might be due simply to the presence of negative affect, rather than anxiety itself.

3.1. Method

3.1.1. Participants

Ninety-seven undergraduates (23 men, 64 women, 10 failed to indicate gender) participated in exchange for course credit.

3.1.2. Assessment of trait anxiety

Trait anxiety was assessed with the trait version of the state/trait anxiety inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). This scale has been shown to exhibit good reliability and internal consistency (Spielberger et al., 1983).

3.1.3. Assessment of worry

The penn state worry questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) is a 16-item scale measuring the frequency and intensity of general worry. This scale has been shown to exhibit good reliability and internal consistency (e.g., Meyer et al., 1990).

3.1.4. Assessment of negative affect

The negative affect (NA) subscale of the positive and negative affect schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess negative affect. Internal reliability of the PANAS is good; validity coefficients and discriminant and convergent properties are also good, indicating that trait affect as indexed by the PANAS is discriminable from related constructs such as depression and anxiety (Watson et al., 1988).

3.1.5. Risk decision-making task

The BART was used again to assess risk decision-making (see Study 1).

3.2. Results and discussion

Descriptive statistics are provided in Table 1. As predicted, we observed a significant relationship between trait anxiety and BART performance such that relatively anxious individuals exhibited greater risk-avoidance, $r = -.22$, $p = 0.05$. There was also a positive relationship between risk-avoidant BART performance and worry, $r = -.21$, $p = 0.05$. These findings are consistent with our hypothesis that global anxiety constructs would be associated with risk-avoidant decision-making.

To test whether the links between anxiety and risk-aversion may have been due to the presence of negative affect, the relationships among trait anxiety, worry, and BART scores were assessed while controlling for the NA scale of the PANAS. While controlling for NA, the partial correlation between trait anxiety and BART scores remained largely unchanged, $r = -.18$, $p < 0.10$, as did the correlation between worry and BART scores, $r = -.18$, $p < 0.10$. In neither case did NA predict risk decision-making. NA was unrelated to BART performance, after controlling for trait anxiety, $r = 0.03$, $p = 0.78$, and worry, $r = 0.03$, $p = 0.82$. Thus, it is unlikely that the

Table 1
Descriptive statistics and bivariate correlations for Study 2 variables

	(1)	(2)	(3)	(4)
STAI	–			
PSWQ	0.68***	–		
PANAS (NA)	0.65***	0.62***	–	
BART score	–.22*	–.21*	–.12	–
N	87	87	87	84
M	38.41	30.31	18.99	34.23
SD	10.31	14.11	6.55	11.54
SEM	1.11	1.51	0.70	1.26

* $p = 0.05$.

*** $p < 0.001$.

links between trait anxiety, worry, and risk-avoidant decision-making are attributable simply to the presence of negative affect.

4. Study 3

Studies 1 and 2 provide evidence that basic features of anxiety (trait anxiety, worry, social anxiety) are associated with risk-avoidant decision-making. However, one limitation of these samples was a restriction of range in anxiety. Therefore, we examined a sample of individuals diagnosed with anxiety psychopathology to assess relevant predictions within a wider range of anxiety. Another goal was to further explore the degree to which risk-aversion is specific to anxiety, as opposed to negative affect more generally. Therefore we also assessed risk-aversion in patients with mood disorders, who provided a comparison group suffering from high levels of negative affect. In addition, we included a nonclinical control group, as well as a nonaffective psychopathologies group (e.g., learning disorders/ADHD), for comparative purposes. We expected that individuals with anxiety pathology, compared to the other groups, would demonstrate exaggerated risk-avoidance.

4.1. Method

4.1.1. Participants

The clinical sample included 63 individuals presenting at a university psychology clinic over the course of approximately 9 months (54% female; Mean age = 27.9 years, SD = 10.2). Patients were assessed using the Mini International Neuropsychiatric Interview (Sheehan et al., 1998). The sample was divided into three diagnostic groups: Anxiety disorders ($n = 14$; GAD = 5, SAD = 2, PD = 2, PTSD = 2, OCD = 2, Adjustment Disorder with Anxious Mood = 1), Mood disorders ($n = 22$; MDD = 15, Dysthymia = 4, Adjustment Disorder with Depressed Mood = 2, Bipolar I = 1), and Learning disorders/No Formal Axis I diagnosis ($n = 27$; Reading Disorder = 4, ADHD = 4, Disorder of Written Expression = 2, Learning Disorder NOS = 2, Mathematics Disorder = 1, Partner relationship problem = 1, Occupational problem = 2, this group also included 11 individuals presenting for treatment who failed to meet criteria for any Axis I condition). Preliminary analyses indicated no significant differences among the three patient groups on any demographic variables. Measures for the current study were obtained during intake evaluation.

The non-clinical sample consisted of one-hundred nineteen undergraduate Psychology students (78 women, 41 men). Measures were obtained during a group administration and these participants received course credit. The control sample was relatively younger than the clinical sample (Mean age = 18.5 years, SD = 0.9), which is a notable limitation of the study. There were no differences in age between diagnostic groups within the clinical sample ($F < 1$), however, so any observed differences among those groups are not likely to be attributable to age differences.

4.1.2. Mini international neuropsychiatric interview (MINI; Sheehan et al., 1998)

The MINI is a structured clinical interview based on the symptoms listed in DSM-IV and ICD-10 for several psychiatric disorders (see Sheehan et al., 1998 for reliability and validity data).

4.1.3. Clinical global impressions scale (CGI; Guy, 1976)

The CGI is a commonly used assessment of global functioning, and has received support as a psychometrically sound index of overall symptom severity (e.g., Leon, Shear, Klerman, & Portera, 1993). Clinicians rated the overall severity of symptoms using a seven-point scale.

4.1.4. Risk-taking measure

A 14-item version of the risk-taking behaviors scale (RTBS; Weber, Blais, & Betz, 2002) assessed people's willingness to engage in risky decision-making. Responses to this scale predict frequency of risk-taking in both naturalistic settings and the laboratory (Weber et al., 2002). Items assess risk decision-making across several overlapping domains, including health/safety (e.g., "Not wearing a seatbelt when being a passenger in the front seat"), social interaction (e.g., "Defending an unpopular issue that you believe in at a social occasion"), and gambling (e.g., "Betting a day's income on the outcome of a sporting event"). A measure of risk-taking orientation was calculated by averaging responses to all items ($\alpha = 0.65$). Lower scores indicate greater risk-aversion.

4.2. Results and discussion

One-way analysis of variance (ANOVA) confirmed significant differences among groups (Anxiety, Mood, Learning, and Control), $F(3,178) = 11.50$, $p < 0.001$ (see Fig. 1). Follow-up comparisons assessed the reliability and magnitude of differences (a) between anxiety patients and the non-clinical control group; (b) between anxiety patients and other clinical patients.

The first comparison (anxiety versus control) confirmed that anxiety patients reported substantially greater risk-aversion ($M = 2.45$, $SD = 0.51$) than did non-clinical controls ($M = 3.05$, $SD = 0.44$), $F(1, 131) = 31.03$, $p < 0.001$, $d = 1.59$. The second comparison (anxiety versus other clinical groups) confirmed that patients with anxiety diagnoses endorsed a level of risk-taking

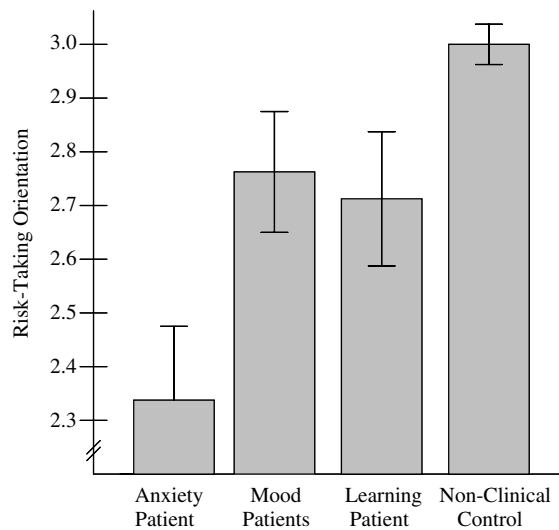


Fig. 1. Patients diagnosed with forms of anxiety psychopathology exhibited greater risk-aversion than did other clinically diagnosed patients (Mood disorders, Learning disorders), and non-clinical controls.

($M = 2.34$, $SD = 0.53$) that was significantly lower than that endorsed by those with Mood disorders ($M = 2.76$, $SD = 0.52$) or Learning disorders ($M = 2.71$, $SD = 0.66$). Patients in these latter two groups did not differ from one another, $F < 1$. Compared with these two groups (controlling for CGI, i.e., overall symptom severity), the Anxiety group was appreciably more inclined to avoid risks, $F(1, 59) = 5.34$, $p = 0.02$, $d = 0.69$.

To further address the issue of specificity, we examined whether the risk-aversion exhibited by the Anxiety group may have been simply a characteristic of negative affect, a characteristic shared by both the Anxiety and Mood groups. Analyses revealed that anxiety patients were appreciably more risk-averse than mood patients (controlling for CGI), $F(1, 32) = 7.28$, $p = 0.01$, $d = 0.87$. Although this does not completely rule out the possibility that negative affect is responsible for the risk-aversion exhibited by anxiety patients, it is inconsistent with what one would expect if their shared feature (NA) was the primary determinant of risk-avoidance.

5. General discussion

The current studies provide evidence for a link between individual differences in anxiety and the presence of basic forms of risk-avoidant decision-making. Across three studies, using normative and clinical samples, as well as behavioral and self-report measures, dispositional anxiety was consistently associated with signs of risk-aversion. Individuals with relatively high levels of social anxiety (Study 1), trait anxiety, and worry (Study 2) exhibited risk-avoidant decision-making on a behavioral decision-making task. Study 3 provided evidence for the link between anxiety and risk-avoidance in an anxiety-disordered sample, within which the uppermost range of dispositional anxiety could be observed. The current findings suggest that anxiety is associated with a decision-making bias that is fairly basic and fundamental. Dispositional anxiety was associated with performance on a behavioral task that taps into a very basic propensity to take risks, as opposed to a propensity to take risks within any particular domain (Studies 1 and 2), as well as with self-reported risk-aversion that mapped onto several different behavioral domains (Study 3).

Several additional findings suggest that the observed link between dispositional anxiety and risk-avoidance is not attributable merely to the presence of negative affect but, rather, is specific to anxiety. First, the observed relationships among trait anxiety, worry, and risk-aversion could not be explained by individual differences in negative affect (Study 2). Second, anxiety patients were substantially more risk-averse than patients suffering from other mood disorders (e.g., major depressive disorder). These studies, therefore, move beyond previous findings on anxiety and risk, which have not previously controlled for the presence of general negative affect.

The current findings are consistent with previous evidence suggesting links between risk-aversion and fear (Lerner & Keltner, 2001; Maner & Gerend, in press). Anxiety – like fear – serves as a salient form of information signaling the presence of potential threat (Schwarz & Clore, 1983). Thus, risk-avoidant decision-making can be viewed as the output of a motivational process – initiated by the experience of anxiety – that leads individuals to avoid threats associated with potentially risky courses of action. As Barlow (1988) wrote: “The capacity to experience anxiety and the capacity to plan are two sides of the same coin” (p. 12).

The use of a clinically-diagnosed anxiety sample allowed for a unique exploration of the links between dispositional anxiety and risk-avoidant decision-making. Whereas the range of anxiety

tends to be relatively limited in normative populations, the experience of anxiety in clinical samples is appreciably heightened, allowing us to examine the extent to which the link with decision-making is apparent in the extreme range of anxiety. Results suggested that the link between anxiety and risk-avoidance was not only apparent, but that its magnitude was pronounced, relative to what was found in the range of normal individual differences in anxiety. The observed differences in magnitude also may be partially due to method variance, because different measures were used in the first two studies versus the third. Nevertheless, the findings are at least suggestive of heightened risk-avoidance at the upper end of the distribution of dispositional anxiety.

One issue worth considering is whether the observed findings reflect trait levels of anxiety versus state anxiety. Trait anxiety is typically conceptualized as the propensity to experience high levels of anxiety across time and situations and as such, trait anxiety and state anxiety tend to be highly correlated (Spielberger et al., 1983). Although the measures used in the current studies were designed to evaluate trait levels of anxiety and therefore can only imply a direct link between risk-avoidant decision-making and trait anxiety, findings are also consistent with the possibility that state anxiety contributes to risk-avoidance among dispositionally anxious individuals. That is, among anxious individuals, decision-making processes presumably are shaped in part by anxiety experienced in the moment. Future research might benefit from further clarifying the extent to which risk-avoidance is characteristic of trait versus state anxiety.

There are limitations to the current research that warrant discussion, in part because they provide useful avenues for future research. First, although theory suggests several variables that might mediate the relationship between anxiety and risk-avoidant decision-making (e.g., pessimistic outcome appraisals), the current studies did not explore potential mediators. A potentially fruitful line of research in this area, therefore, could explore the operation of mediating processes. One possible mediator worth investigation is lack of perceived control, which has been implicated in both anxiety (Hofmann, 2005) and risk-avoidance (Horswill & McKenna, 1999). Second, although the current research suggests the presence of decision-making biases that are relatively basic and “content-free,” further studies are needed to assess the extent to which individual differences in anxiety are associated with risk-aversion in specific domains. Theories addressing the link between decision-making biases and individual differences in affective processing should be sensitive to both the generality, as well as domain-specificity, of these biases. Third, while the current studies provide multi-method evidence for the link between dispositional anxiety and risk-avoidance, they did not exhaust all possible methods for assessing basic decision-making processes. Further studies are needed to evaluate the extent to which the current findings generalize to other forms of decision-making.

Despite these limitations, the current research has potential implications for theories of anxiety. As the current studies suggest, anxiety may shape people’s choices. In turn, choices may reinforce dispositional qualities associated with emotional processing. As anxious individuals engage in risk-avoidant decision-making, for example, consequent behavioral avoidance could increase the experience of anxiety, thereby promoting a self-perpetuating cycle in which (a) anxiety acts as an input into the decision-making process and (b) risk-avoidant decision-making promotes further anxiety and risk-avoidant behavior. The current study provides only indirect evidence for this cycle; further research is needed to more directly describe its possible operation. At the very least, the current research provides a springboard from which to examine the possibility that risk-avoidant decision-making serves to reinforce pre-existing individual differences in anxiety.

In addition to their implications for theories of anxiety, the current studies also have implications for theories of decision-making. The current research fits with a growing body of evidence suggesting that affective experiences – at both trait and state levels – shape choice. The current findings suggest the utility of a functionalist, motivation-based approach to affect and choice and are consistent with other theories positing emotion-specific adaptive influences on judgment and decision-making (e.g., Fessler et al., 2004; Maner & Gerend, in press).

The current findings may also have important clinical implications. Within clinical contexts, decision-making biases have been explored primarily in the area of disinhibitory psychopathology (e.g., risk-seeking by those with substance use disorder; e.g., Fishbein et al., 2005). In the current studies, we provide evidence suggesting that risk decision-making is also linked to the experience of anxiety, although in the case of anxiety, the outcome seems to be pronounced risk-avoidance, rather than risk-seeking. This research therefore may have implications for understanding basic cognitive processes associated with anxiety psychopathology.

Thus, in providing evidence for a link between dispositional anxiety and risk-avoidant decision-making, the current research has implications for theories of individual differences in affective processing, as well as theories that integrate links between affect, judgment, and choice. Moreover, the current studies may have implications for understanding the role basic decision-making processes play at the extreme end of the distribution of dispositional anxiety – that is, diagnosable forms of anxiety disorder. The current research, therefore, may be of importance to several different areas within the psychological sciences.

Acknowledgements

This research was supported by National Institutes of Health grants MH72848 and MH62056.

References

- Allen, N. B., & Badcock, P. B. (2003). The social risk hypothesis of depressed mood: Evolutionary, psychosocial, and neurobiological perspectives. *Psychological Bulletin*, *129*, 887–913.
- Barlow, D. H. (1988). *Anxiety and its disorders: The nature and treatment of anxiety and panic*. NY: Guilford Press.
- Butler, G., & Mathews, A. (1987). Anticipatory anxiety and risk perception. *Cognitive Research and Therapy*, *11*, 551–565.
- Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology*, *100*, 316–336.
- Fessler, D. M., Pillsworth, E. J., & Flamson, T. J. (2004). Angry men and disgusted women: An evolutionary approach to the influence of emotion on risk-taking. *Organizational Behavior and Human Decision Processes*, *95*, 107–123.
- Fishbein, D. H., Eldreth, D. L., Hyde, C., Matochik, J. A., London, E. D., Contoreggi, C., et al. (2005). Risky decision-making and the anterior cingulate cortex in abstinent drug abusers and nonusers. *Cognitive Brain Research*, *23*, 119–136.
- Gasper, K., & Clore, G. L. (1998). The persistent use of negative affect by anxious individuals to estimate risk. *Journal of Personality and Social Psychology*, *74*, 1350–1363.
- Guy, W. (1976). *ECDEU Assessment Manual for Psychopharmacology*. Bethesda, MD: US Department of Health Education and Welfare.
- Hayward, C., Killen, J. D., Kraemer, H. C., & Taylor, C. B. (2000). Predictors of panic attacks in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, *39*, 207–214.
- Hofmann, S. G. (2005). Perception of control over anxiety mediates the relation between catastrophic thinking and social anxiety in social phobia. *Behavior Research and Therapy*, *43*, 885–895.

- Horswill, M., & McKenna, F. (1999). The effect of perceived control on risk taking. *Journal of Applied Social Psychology*, 29, 377–391.
- Joiner, T. E., Steer, R. A., Beck, A. T., Schmidt, N. B., Rudd, M. D., & Catanzaro, S. J. (1999). Physiological hyperarousal: Construct validity of a central aspect of the tripartite model of depression and anxiety. *Journal of Abnormal Psychology*, 108, 290–298.
- Leary, M. (1983). A brief version of the fear of negative evaluation scale. *Personality and Social Psychology Bulletin*, 9, 371–375.
- Lejuez, C. W., Aklin, W. M., Jones, H. A., Richards, J. B., Strong, D. R., Kahler, C. W., et al. (2003). The balloon analogue risk task (bart) differentiates smokers and nonsmokers. *Experimental and Clinical Psychopharmacology*, 11, 26–33.
- Lejuez, C. W., Read, J. P., Kahler, C. W., Richards, J. B., Ramsey, S. E., Stuart, G. L., et al. (2002). Evaluation of a behavioral measure of risk taking: The balloon analogue risk task (BART). *Journal of Experimental Psychology: Applied*, 8, 75–84.
- Leon, A., Shear, M., Klerman, G., & Portera, L. (1993). A comparison of symptom determinants of patient and clinician global ratings in patients with panic disorder and depression. *Journal of Clinical Psychopharmacology*, 13, 327–331.
- Lerner, J. S., & Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgment and choice. *Cognition and Emotion*, 14, 473–493.
- Lerner, J. S., & Keltner, D. (2001). Fear, anger, and risk. *Journal of Personality and Social Psychology*, 81, 146–159.
- Levin, I. P., & Hart, S. S. (2003). Risk preferences in young children: Early evidence of individual differences in reaction to potential gains and losses. *Journal of Behavioral Decision-making*, 16, 397–413.
- Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, 127, 267–286.
- Maner, J. K., & Gerend, M. A. (in press). Motivationally selective risk judgments: Do fear and curiosity boost the boons or the banes? *Organizational Behavior and Human Decision Processes*.
- Maner, J. K., Kenrick, D. T., Becker, D. V., Robertson, T. E., Hofer, B., Neuberg, S. L., et al. (2005). Functional projection: How fundamental social motives can bias interpersonal perception. *Journal of Personality and Social Psychology*, 88, 63–78.
- Maner, J. K., & Schmidt, N. B. (2006). The role of risk-avoidance in anxiety. *Behavior Therapy*, 37, 181–189.
- Mellers, B. A., Schwartz, A., Ho, K., & Ritov, I. (1997). Decision affect theory: Emotional responses to risky options. *Psychological Science*, 8, 423–429.
- Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the penn state worry questionnaire. *Behaviour Research and Therapy*, 28(6), 195–487.
- Raghunathan, R., & Pham, M. T. (1999). All negative moods are not equal: Motivational influences of anxiety and sadness on decision-making. *Organizational Behavior and Human Decision Processes*, 79, 56–77.
- Savitsky, K., Medvec, V. H., Charlton, A. E., & Gilovich, T. (1998). “What, me worry?” arousal, misattribution and the effect of temporal distance on confidence. *Personality and Social Psychology Bulletin*, 24, 529–536.
- Schwarz, N., & Clore, G. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *Journal of Personality and Social Psychology*, 45, 513–523.
- Shackelford, T. K., LeBlanc, G. J., & Drass, E. (2000). Emotional reactions to infidelity. *Cognition and Emotion*, 14, 643–659.
- Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., et al. (1998). The mini-international neuropsychiatric interview (m.I.N.I.): The development and validation of a structured diagnostic psychiatric interview for dsm-iv and icd-10. *Journal of Clinical Psychiatry*, 59, 22–33.
- Shepperd, J. A., Grace, J., Cole, L. J., & Klein, C. (2005). Anxiety and outcome predictions. *Personality and Social Psychology Bulletin*, 31, 267–275.
- Spielberger, C. D., Gorsuch, R. L., Lushene, R. E., Vagg, P. R., & Jacobs, G. A. (1983). *State-trait anxiety inventory manual*. Palo Alto, CA: Consulting Psychologists Press.
- Stöber, J. (1997). Trait anxiety and pessimistic appraisal of risk and chance. *Personality and Individual Differences*, 22, 465–476.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The panas scales. *Journal of Personality and Social Psychology*, 54, 1063–1070.
- Weber, E. U., Blais, A., & Betz, N. (2002). A domain-specific risk-attitude scale: Measuring risk perceptions and risk behaviors. *Journal of Behavioral Decision-making*, 15, 263–290.