An Evaluation of Different Measures of Social Problem-Solving: Using Ecological Momentary Assessment

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The present study recruited a sample of undergraduate college students and examined the extent to which three measures of social problem-solving measured the construct of social problem-solving. A self-report measure (i.e., Social Problem-Solving Inventory-Revised Long), analogue task (i.e., the Means-Ends Problem-Solving task), and ecological momentary assessment (i.e., a diary card on real-life events) were compared. It was hypothesized that the three measures would assess different aspects of social problem-solving. The analogue task would theoretically be a measure of ability to generate solutions to a problem, the diary card would theoretically measure implementation of solutions in real-life, and the self-report measure would represent a global score. Overall, the results were contradictory. Non-significant bivariate correlations between these three measures indicated that they are generally not indexing the same processes. That is, scores on one measure did not predict scores on the other measures. There was one exception in that the use of relevant means to solve a social problem on the analogue task moderately predicted use of relevant means used on the diary card. Contradictory to the correlational results, paired-sample t-tests were conducted to further examine the degree that the analogue task and diary cards index the same processes, and the results indicated that performance on the tasks were generally similar. There were no statistically significant differences between performance on the analogue task and the diary cards in terms of average effectiveness of strategies and irrelevant strategies used to solve problems. Thus, participants
were performing similarly across these two measures. However, there was a significant difference between average number of relevant means used to solve a problem between the two tasks. Individuals used fewer relevant means to solve problems in real-life than they did when solving the hypothetical problems on the analogue task. This indicates that participants performed differently across the two tasks in terms of relevant means. While use of relevant means on the analogue task predicted the use of relevant means on the diary cards, participants used more relevant means on the analogue task than the diary card task.

Additional secondary hypotheses were conducted to explore the role of state-anxiety and emotion regulation on social problem-solving skills as measured by the self-report measure of emotion regulation as well as the diary card task. It was hypothesized that a moderate amount of state-anxiety would be associated with the highest performance on the diary card task in terms of effectiveness compared to higher or lower levels of state-anxiety. It was also hypothesized that individuals with high state-anxiety while solving an interpersonal problem would be effective problem-solvers if they also were also skilled at regulating their emotions. Results of these hypotheses were non-significant. However, the sample size was insufficient as determined by an a priori power analysis. Overall the results of this study may provide future researchers with information to help guide their decision-making when selecting measures of social problem-solving.
ACKNOWLEDGEMENTS

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I would also like to thank my parents. Thank you to my mom for modeling what it means to continue to strive towards your goals no matter how many challenges are in the way. And to my dad, for your unconditional support. Dad, thank you for instilling in me not only the value of education and hard work, but always encouraging me to choose a career that I enjoy and that provides meaning in my life like you have done for yourself.

To my friends, colleagues, and lab-mates, thank you for your ongoing support, comedic relief, encouragement, and validation.

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Dana B. Goetz
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PROBLEM STATEMENT

A major goal among researchers is to ensure that measures of dependent variables are ecologically valid (Shiffman, Stone, & Hufford, 2008); that is, the extent to which the dependent variable measure generalizes to typical everyday life (Stone & Shiffman, 2011). Ecological validity may be especially important for researchers in fields like clinical psychology where diagnostic and treatment decisions are based on understanding the relevant behaviors and functional impairments that occur in real-life settings (Shiffman et al., 2008). Thus, assessments of patients in their natural environment may increase the construct, ecological, and external validity of the assessments used to inform diagnosis and treatment (Trull & Ebner-Priemer, 2009). Unfortunately, a majority of research relies on retrospective self-reports of behavior or laboratory/analogue tasks which can limit the understanding of behavior in the context that it occurs in real-life settings (Shiffman et al., 2008).

Retrospective self-reports hold many disadvantages to measuring psychological phenomena and behavior directly. Significant discrepancies between self-report measures and real-time assessments have been demonstrated in research related to a variety of clinical problems (Fahrenberg, Myrtek, Pawlik, & Perrez, 2007; Solhan, Trull, Jahng, & Wood, 2009; Stone & Broderick, 2007; Anderson, Goddard, and Powell, 2009; Anderson, Goddard, & Powell, 2011). With self-report measures, participants may have difficulty accurately answering questions due to several sources of retrospective bias. They may tend to recall experiences that were more personally relevant, that occurred recently, that were significant, or that are consistent with their current mood state (Trull & Ebner-Priemer, 2009). Some researchers have attempted to address limitations with self-report measures through the use of analogue/laboratory tasks.
Laboratory tasks examine participants’ responses while in a laboratory setting that has, to some capacity, been manipulated to approximate a real-life setting or situation, but may still not be ecologically valid (Moskowitz & Young, 2006). Threats to ecological validity in laboratory tasks may arise from the match between the laboratory task and the definition of the behavior being studied. For example, if the response being studied is likely to only occur in situations that are very similar to the laboratory task, then there would be a good match between the task and the behavior being measured. However, if the response to the laboratory task is likely to occur in a wide variety of situations, then measuring that response to the specific and standardized laboratory task may not give an accurate picture of what that behavior would look like in real-life. Laboratory tasks can sometimes be artificial and lack the stimuli that would control behavior in real-life. For example, laboratory tasks may not induce the emotional context that would be present in real-life. The lack of this emotional context could result in behavior that is not representative than what would happen in real-life when more emotions are present. In addition, behavior may be different during an analogue task when there are no real-world consequences. Researchers have had some difficulty establishing that results of laboratory tasks are correlated with results of real-life situations (Anderson et al., 2009; Anderson et al., 2011) and the reliability of responses between such tasks (Epstein, 1980; Moskowitz, 1990).

Researchers have suggested that a viable alternative to self-report measures and laboratory tasks are ecological momentary assessments (EMA; Trull & Ebner-Primer, 2009; Shiffman et al., 2008; Stone et al., 1998; Moskowitz & Young, 2005). Stone and Shiffman (1994) define EMA as (a) data collected from real-life environments; (b) measures that collect data on extremely current or recent states or behaviors; (c) event-based, time-based, or randomly prompted assessments; and (d) completion of multiple assessments over-time. Examples of
EMAs include paper diaries, electronic diaries, and telephone calls. EMAs may have an advantage over self-report and laboratory tasks because they capture mood, thoughts, symptoms, or behaviors that are expected to change over time and across situations in close proximity to when the phenomenon occurs (Ebner-Primer, Eid, Stabenow, Kleindienst, & Trull, 2009). For example, someone may solve a problem differently depending on the type of mood they are in, the time of day, or the importance of the problem. In addition, collecting data as close to real-time as possible may help prevent or reduce recall bias and provide a clearer understanding of the behavior of interest.

**LITERATURE REVIEW**

Interpersonal functioning may be a variable that is especially important to measure accurately because of its relevance to a large number of psychological disorders. The criteria for nearly every disorder in the Diagnostic and Statistical Manual 5 (DSM-5) stipulate that the symptoms impact interpersonal functioning: “the disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning” (American Psychiatric Association, 2013). Social problems and social problem-solving skills cut across DSM syndromes (Girard, et al. 2017). For example, poor problem-solving skills are associated with depression and anxiety symptoms (Kirkham, Choi, & Seitz, 2015; Cuijpers, Wit, Kleiboer, Karyotaki, & Ebert, 2018; Pawluk, Koerner, Tallon & Antony, 2017; Anderson, Goddard, & Powell, 2009; Anderson, Goddard, & Powell, 2011), posttraumatic stress disorder severity (Reich, Blackweel, Simmons, & Beck, 2015), and eating disorders (Hartmann, Zeeck, & Barrett, 2010; Ridout, Matharu, Sanders, & Wallis, 2015). Given the transdiagnostic nature of interpersonal problems, social processes are even a proposed domain for the Research Domain Criteria (RDoC) (Sanislow et al., 2010). The RDoC emphasizes domains of research that focus
on the function or mechanisms of psychological disorders. However, the importance of measuring social problem-solving skill deficits goes beyond the fact that such deficits are common among many psychological disorders.

Interpersonal functioning is important to measure accurately because, for many populations, interpersonal relationships are important. Individuals with advanced cancer frequently list relationships as a top area of life that provides them meaning (Tomás-Sábado, et al. 2015). For children, feelings of belongingness in peer groups and relationships with adults are strong predictors of life satisfaction (Gadermann et al., 2015). In general, quality social relationships are associated with subjective well-being, in addition to physical health and income (Lamu & Olsen, 2016). It can be argued that social skills are a crucial skill to acquire in order to access the resources associated with social relationships (Lin, 1999). Thus, due to the importance and relevance of social problem-solving skills, there is a need for more ecologically valid measures.

The extent to which measures of social problem-solving generalizes to real-life is questionable because the analogue and self-report methods typically used may not closely approximate real-life problem-solving. This is troubling when social problem-solving refers to the “real world,” and is defined as the “the process by which people attempt to identify or discover effective or adaptive solutions to problems they experience in everyday living” (D’Zurilla, Nezu, & Maydeu-Olivares, 2002, p. 1). As Anderson, Goddard, and Powell (2009) stated, research has consistently shown that planned actions do not always result in actual behavior. This represents a major flaw in analogue measures such as the Means-Ends Problem-Solving Task (MEPS; Platt & Spivack, 1975) in which an individual is given the beginning and outcome of a hypothetical situation and is asked to fill in the middle piece with what they would
do in order to achieve the specified outcome. It is possible that people know and can articulate what to do, but in practice fail to carry out the actions in real-life situations. To get around the barrier of intent, one method of measuring social problem-solving skills and implementation of plans to solve a given problem is to use diary cards.

To date, two known studies have used the diary card method as a means to measure social problem-solving (Anderson et al., 2009; Anderson et al., 2011). Anderson, Goddard, and Powell (2009) compared a real-life problem-solving measure in the form of a diary card to traditional measures of social problem-solving. Social problem-solving ability was compared across three groups of college students: students with depressive and anxiety symptoms, students with only anxiety symptoms, and a control group of students who reported a normal range of anxiety and depressive symptoms. Participants were asked to complete measures of anxiety and depression, a self-report measure of problem-solving (the SPSI-R:L) and a laboratory task of social problem-solving (the MEPS). Participants also were asked to complete a personal-MEPS (p-MEPS) task in which they were asked to write four situations similar to the four situations in the MEPS that happened to them in real life, how they had actually handled the problem, and in retrospect what they think would have been ideal to do. Next, participants were asked to complete the diary card task in which they were instructed to record at least four interpersonal problems that occurred in real life over the next two to four weeks. Participants were told to outline the problematic situation, explain how they tried to solve the problem, and then describe the outcome. The researchers found that only the real-life problem-solving tasks (i.e., the diary card and the p-MEPS) revealed differences between the groups. Participants with mixed depression/anxiety participants used fewer effective strategies compared to the control group. However, no significant group differences were found with MEPS performance or with the self-
report measure across the groups. These results suggest that self-report measures of social problem-solving and the MEPS task as typically presented may be unable to detect impairments in real-life problem-solving in clinical populations.

In another study, the same measures of social problem-solving were used (i.e., SPSI-R:L, MEPS, and the diary card method) to see if social problem-solving ability could predict depressive symptoms (Anderson et al., 2011). Participants were asked to complete two separate testing sessions. In the first session, participants completed a measure of depressive symptoms (i.e., the Beck’s Depression Inventory, BDI), the SPSI-R:L, the MEPS, and the diary task method developed by Anderson, Goddard, and Howell (2009). The second testing session took place one semester later in which participants were asked to complete the BDI. Problem-solving skills, as measured by the MEPS and the diary card task, proved to be a significant predictor of future depressive symptoms. That is, participants who used fewer effective strategies when completing the MEPS and diary card went on to report higher levels of depressive symptoms at the second testing session. In addition, the diary card measure of problem-solving predicted depressive symptoms above and beyond the MEPS. This suggests that the capability to solve a hypothetical problem is different from the ability to implement strategies in real-life. Furthermore, the researchers did not find a significant correlation between the MEPS and the diary task which further supports the idea that hypothetical problem solving is different than real-life problem solving.

To continue to support the idea that the MEPS as typically administered may not be ecologically valid, researchers have found that state negative emotional arousal and emotion dysregulation impact problem solving ability (Dixon-Gordon, Chapman, Lovasz, & Walters, 2011; Dixon-Gordon, Chapman, & Turner, 2015). The MEPS is not typically administered with
any type of mood induction, but one study used a mood-induction along with the MEPS and demonstrated that emotional context had a great influence on social problem-solving skills (Dixon-Gordon et al., 2011). For example, individuals high in borderline personality symptoms exhibited a significant decrease in number of relevant means used in the MEPS after a mood-induction compared to their performance on the MEPS before the mood-induction. On the other hand, individuals low in borderline personality symptoms showed an increase of relevant strategies used on the MEPS after the mood-induction than before. These findings are somewhat consistent with the well-known Yerkes-Dodson law which states that level of arousal can impact performance (Yerkes & Dodson, 1908). The MEPS as typically administered neglects the emotional context likely present when social problem-solving occurs in real-life. In addition, researchers have found that an emotion regulation Dialectical Behavior Therapy (DBT; Linehan, 1993a, b) skills group alone improved interpersonal effectiveness. Having skills to regulate emotions may be part of the equation when it comes to being effective in interpersonal situations.

**THE CURRENT STUDY**

The primary goals of the current study were to analyze the differences between three measures of social problem-solving: an analogue task (i.e., the MEPS), a real-life problem solving diary card, and a self-report measure (i.e., SPSI-R:L). Determining if there are differences between these forms of measurement may help researchers more accurately assess social problem-solving. Existing research is conflicting, with one study indicating a correlation between the MEPS and the diary task (Anderson, Goddard, & Howell, 2009) and another showing no correlation between the two tasks (Anderson, Goddard, & Howell, 2011). Researchers have also reported that the MEPS may be more of a measure of intent than a reflection of actual behavior (Anderson et al., 2011). That is, the MEPS may be a measure of
knowing what should ideally be done in a situation, but not actually measure how effective someone is at implementing ideal responses in real-life situations. Anderson and colleagues (2009) concluded this after seeing that “more ecologically valid” measures of social problem-solving (i.e., diary cards) were better predictors of anxiety and depression than the standard measures (i.e., self-report and MEPS). Diary cards are argued to be more ecologically valid because they measure “real-life,” problem-solving close to “real-time,” whereas the MEPS involves hypothetical problem-solving in a contrived setting and self-report measures have retrospective biases. In addition, only the diary cards revealed differences between a mixed depression/anxiety group and a control group; standard measures did not (Anderson et al., 2011).

Thus, it was expected that there would be significant differences when comparing the diary card task and the MEPS on number of relevant means, irrelevant means, and average effectiveness of means used to solve a given problem. Specifically, that individuals would generate fewer relevant means, lower average effectiveness of means, and more irrelevant means on the diary task than on the MEPS.

In addition, two secondary aims for the study involved examining how state-anxiety and emotion regulation affected social problem-solving ability. Emotional context has shown to impact performance on the MEPS (Dixon-Gordon et al., 2011). Low and high levels of anxiety are also known to hinder performance (Yerkes & Dodson, 1908) and individuals with mixed depression/anxiety symptoms have demonstrated to be less effective problem-solvers than asymptomatic individuals (Anderson et al., 2009). In addition, Dixon-Gordon and colleagues (2015) found that social problem-solving skills significantly improved after completion of a DBT emotion regulation skills group. If state-anxiety does impact effectiveness of social problem-solving, then it is possible that the ability to regulate emotions mitigates that impact. That is,
individuals who experience a high-level state-anxiety when facing an interpersonal problem may maintain their effectiveness at social problem-solving if they have good emotion regulation skills. In summary, the present study has two primary hypotheses and two secondary hypotheses:

**Primary Hypotheses**

**Hypothesis one.** While conceptually similar measures, the MEPS, SPSI-R:L, and diary card task will not be correlated with each other or will have weak correlations with each other, demonstrating that these measures are targeting different aspects of problem-solving. To determine if the three measures of social problem-solving are measuring the same construct, bivariate correlations were calculated.

**Hypothesis two.** When comparing the diary card task and the MEPS on number of relevant means, number of irrelevant means, and the average effectiveness of means there will be a significant difference. In particular, the diary card task will have fewer relevant means, lower average effectiveness of means, and more irrelevant means than the MEPS. Dependent samples t-tests (two-tailed) were used to compare the number of relevant means, irrelevant means, and the average effectiveness of means between the MEPS and the diary card.

**Secondary Hypotheses**

**Hypothesis three.** It is hypothesized that state-anxiety (as measured by an item on the diary card) interferes with social problem-solving effectiveness (as measured by the diary card task). A moderate amount of anxiety will be associated with the highest performance in terms of effectiveness. Too much or too little anxiety will hinder performance, resulting in less effectiveness. One-way Analysis of Variance (ANOVA) were used to determine how state-anxiety levels while solving an interpersonal problem influence the effectiveness of problem-solving. Tertiles were created to separate participants into groups based on their anxiety level
(low = 0-2, moderate = 3-5, or high = 6-7) and an ANOVA was conducted to evaluate group differences on effectiveness of problem solving. Since participants reported on four different real-life scenarios, the ANOVA was done four times, once for each scenario.

**Hypothesis four.** It is hypothesized that trait emotion regulation (as measured by a self-report measure) will moderate the relationship between state-anxiety and the effectiveness of problem solving (as measured by the diary card task). In other words, it is hypothesized that individuals with high state-anxiety while solving an interpersonal problem will be effective problem-solvers if they also are skilled at regulating their emotions. Since participants reported on four different real-life scenarios, the moderation analysis was done four times, once for each scenario.

**METHODS**

**Participants**

Research participants were recruited from lower level courses at a university. Any student was eligible to participate as long as they were enrolled at the university and were 18 years of age or older. A total of 152 participants were enrolled in the study. Participants were excluded from analyses for a few reasons. First, participants were excluded if they did not agree to complete phase two. Thirty-two participants were excluded for this reason. Second, participants were excluded if they completed phase one, agreed to complete phase two, but never completed phase two. Fifty-eight participants were excluded for this reason. Second, participants who did not follow the instructions for completing the diary cards were excluded from analyses as this would counter-act the purpose of trying to use the diary cards as a form of EMA. Specifically, participants who reported on interpersonal problems that happened prior to the participation in the study were excluded. The third reason participants were excluded were if they had not successfully replicated
their unique identifier given at phase one to connect their data to phase two. Eleven participants were excluded for reasons two and three, but their diary card data were still used as practice data for coders. This left a total of 51 participants who completed the study. See Figure 1 for a participant flow diagram reflecting the attrition of participants within the study.

Figure 1. Participant flow diagram.

Less than 5% of data were missing with the exception of the recorded dates and times on the diary cards in which a larger percentage of data was missing. To address missing data, a missing data analysis was completed to determine the pattern of missingness. Little’s Missing Completely at Random (MCAR) test confirmed that the data was missing completely at random. The expectation maximization algorithm was used to replace missing data with predicted values (Tabachnick & Fidell, 2007). Next, the outlier label rule was used to detect outliers (see Hoaglin & Iglewicz, 1987) and none were detected.
Of the 51 participants included in the sample, 75.0% were women and 25% men. Age ranged from 18 to 34 years old with the mean age being 20.14 \((SD = 3.14)\). In terms of race and ethnicity, 7.7% \((n = 4)\) of the sample identified as Asian, 25. % \((n = 13)\) African America, 7.7% \((n = 4)\) Hispanic, 53.8% \((n = 28)\) Caucasian, 1.9% \((n = 1)\) Other, and 1.9% \((n = 1)\) declined to answer the question asking about race. See Table 1 for more a more detailed description of the participant demographic characteristics.

Table 1

*Participant Demographic Characteristics*

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<td>Race (% Decline to Answer)</td>
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<td>Income (Decline to Answer)</td>
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<td>1</td>
<td>1.9%</td>
</tr>
<tr>
<td>Relationship (% Married)</td>
<td>2</td>
<td>3.8%</td>
</tr>
<tr>
<td>Relationship (% Single and not Dating)</td>
<td>21</td>
<td>40.4%</td>
</tr>
<tr>
<td>Relationship (% Currently Dating/in a Relationship)</td>
<td>26</td>
<td>50%</td>
</tr>
</tbody>
</table>

**Materials and Procedures**

Research participants were recruited from lower level psychology courses at a university. They were informed of the nature of the study by using a verbal script for in-class recruiting (Appendix A) and paper flyers (Appendix B) that were posted on bulletin boards in various campus buildings. In-class recruiting also included paper slips (Appendix C) and a PowerPoint slide (Appendix D) bearing the name of the study, and the email address of the student investigator (i.e., Dana Goetz). Students who were informed of the study through paper flyers emailed the student investigator to indicate interest and to set up an appointment.
A priori power was calculated. For the primary hypotheses, the required sample size to show a statistically significant effect would be 50 participants. This was based on using G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007) when expecting a moderate effect size (0.25) at a power of .90 and is consistent with the sample sizes used in similar research studies (i.e., Anderson, et al., 2009; Anderson, et al., 2011). The secondary hypotheses required a much larger sample size ranging between 105 and 219 to achieve a power of .80 for moderate effect sizes (.25). These secondary hypotheses were exploratory in nature; therefore, the necessary sample (N = 51) was only obtained for the primary hypotheses.

**Measures**

**Demographics Questionnaire.** The Demographic Questionnaire (Appendix F) was given to collect demographic information such as age, gender, ethnicity, religion, and personal and family income. This demographic questionnaire was constructed by the researcher.

**Difficulties in Emotion Regulation Scale (DERS).** The DERS (Gratz & Roemer, 2004) is a 36-item, self-report measure to assess clinically significant difficulties in emotion regulation (Appendix G). Items range on a five-point Likert scale from “1” to “5” with “1” meaning “almost never,” “2” as “sometimes,” “3” indicating “about half the time,” “4” indicative of “most of the time” and “5” as representative of behavior that “almost always” occurs. The items included in the DERS were chosen to reflect difficulties related to the following definition of emotion regulation: (a) awareness and understanding of emotions; (b) acceptance of emotions; (c) the ability to engage in goal-directed behavior, and refrain from impulsive behavior, when experiencing negative emotions; and (d) access to emotion regulation strategies perceived as effective. Six factors of emotion regulation based on the above definition of emotion regulation are assessed with the DERS: nonacceptance of emotional responses, difficulties engaging in goal-
directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. The DERS has demonstrated high internal consistency (.93 as an alpha coefficient), and strong test-retest reliability (.88 over a four to eight-week span). Adequate construct and predictive validity have been demonstrated by the DERS. Higher scores on the DERS are representative of greater emotion regulation difficulties. Internal consistency for the present sample was Cronbach’s $\alpha = .95$.

**The Means-Ends Problem-Solving Task (MEPS).** The MEPS (MEPS; Platt & Spivack, 1975) is used to assess the ability to identify and describe a solution in different hypothetical interpersonal scenarios (Appendix H). The MEPS consists of 10 interpersonal scenarios in which participants are asked to read the scenario and provide the required steps to achieve a specific outcome. Each scenario includes the beginning of a story where a problem occurs and the end of the story where there was a positive outcome to the problem. Participants are prompted to brainstorm a solution in the middle of the story to obtain the specified outcome of the story. Four MEPS scenarios were selected based on Butler and Meichenbaum’s (1981) recommendation to include relevant scenarios as well as to assure validity of the measure. Participants must complete at least two scenarios in order to accurately measure their ability to problem solve (Platt & Spivack, 1975). In extant literature, MEPS scenarios are chosen based on relevancy to the population being studied (Goddard, Dritschel, & Burton 1996; Goddard, Dritschel, & Burton, 1997; Anderson et al., 2009; Kehrer & Linehan, 1996). In this study, MEPS scenarios were chosen from a modified version of the MEPS designed by Dennis, Astell, and Dritschel (2012) which contains scenarios about highly interpersonal situations (i.e., a best friend leaving, fighting with a partner, and being avoided by friends). In addition, one scenario from the original MEPS was chosen (i.e., moving to a new neighborhood) and modified by the student investigator to better fit a population of college
students (i.e., moving to a new area). All participants were asked to complete each of the four MEPS scenarios, including a practice scenario (i.e., not getting along with a boss) to orient themselves to the task. The MEPS scenarios were counterbalanced across all participants.

**The Social Problem-Solving Inventory-Revised Long (SPSI-R:L).** The SPSI-R:L (D’Zurilla, Nezu, & Maydeu-Olivares, 2002) is a 52-item multidimensional self-report measure of social problem-solving ability corresponding to D’Zurilla and his colleagues’ model of social problem-solving (D’Zurilla, 1986, 1988; D’Zurilla & Goldfried, 1971; D’Zurilla & Nezu, 1982) (Appendix J). Participants rate each item using a 5-point Likert scale ranging from, “0” (not at all true of me) and “5” (extremely true of me). The SPSI-R:L includes five component scales in which the first two measure problem-solving orientation and the last three measure problem-solving style.

The sub-scales that measure problem-solving orientation are the positive problem orientation (PPO) and negative problem orientation (NPO) scales. The PPO scale is a measure of an individual’s belief in their ability to successfully solve a problem as well as the tendency for an individual to perceive the problem as a challenge instead of a threat. Contrary, the NPO scale is a measure of an individual’s belief in not having the ability to solve a problem as well as their likelihood to perceive a problem as a threat or unsolvable (D’Zurilla, Nezu, & Maydeu-Olivares, 2002).

The latter three component scales of the SPSI-R:L measure problem-solving style, and more specifically, the ability to systematically solve a problem by identifying the problem, generating alternative solutions, and choosing the best solution. These component scales include Rational Problem-Solving (RPS), Impulsivity/Carelessness Style (ICS), and Avoidance Style (AS). The RPS component scale is the largest scale and contains 20-items that can be broken down into four different subscales: (a) Problem Definition and Formulation (PDF), (b) Generation of
Alternative Solutions (GAS), (c) Decision Making (DM), and (d) Solution Implementation and Verification (SIV). The ICS scale represents solving a problem in hurried or incomplete way. The AS scale is characterized by procrastination and a passive problem-solving pattern. Raw scores on the SPSI-R:R can be converted into standard scores to compare a participant’s scores to peers of the same age. The total SPSI-R:R score as well as each subscale have a mean of 100 and a standard deviation of 15. Higher scores represent “good” social problem-solving ability and lower scores are characteristic of “poor” problem-solving ability, indicating that there is a deficit that could contribute to impairment in functioning. Specifically, scores ranging from 86-114 are considered to be in the normative group average for each scale. The five components can be added to determine the total score of social problem-solving or each component scale can be interpreted individually (D’Zurilla, Nezu, & Maydeu-Olivares, 2002).

In a study of the original development of the Social Problem-Solving Inventory (SPSI), three types of validity were measured: concurrent validity, construct validity, and predictive validity (D’Zurilla & Nezu, 1990). To assess concurrent validity, the SPSI was compared to the Personal Problem-Solving Inventory (PSI; Heppner & Petersen, 1982) and the MEPS (Platt & Spivack, 1975). Low scores on the PSI indicate better problem-solving ability. The SPSI showed correlations with both measures of problem-solving, (PSI and SPSI - .71; MEPS and SPSI, .73) but is not so highly correlated to indicate that the SPSI is too similar to the MEPS or the PSI. Construct validity was also measured by comparing the SPSI with a measure of similar conceptual significance, the Internal-External Locus of Control Scale (I-E Scale; Rotter, 1966). The two measures correlated significantly, $r (103) = -.29$. The SPSI was also compared to measures of different constructs such as intelligence and academic ability. The SPSI is not correlated with such tests (i.e., Scholastic Aptitude Test or IQ tests). In addition, pre-test and post-test SPSI scores
changed for a group receiving problem-solving training, but not for a group being trained in social support and empathy. Predictive validity was measured by determining if the SPSI predicted good academic performance in college students, assuming that academic success is facilitated by effective and competent problem-solving skills. The SPSI was highly correlated with GPA after college student’s first semester at a university ($r (190) = .23$) (D’Zurilla & Nezu, 1990). SPSI was revised into the SPSI-R:L in order to reduce the number of items and make the number of items in each component scale equal. Each scale SPSI-R:L demonstrates good internal consistency. Test-retest reliability across each scale was also good. Internal consistency for the present sample was Cronbach’s $\alpha = .85$.

**Diary card.** As another measure of social problem-solving and a measure of state-anxiety, this study used a problem-solving self-monitoring form developed by the principle investigator based on Anderson, Goddard, and Howell’s (2009) study (Appendix K). Theoretically, the diary card is a measure of implementation of social problem-solving given that data is collected about what participants did to solve interpersonal problems in real-life immediately after the problem occurred. Participants were asked to record the date and time the interpersonal problem occurred and to record the date and time they wrote about the problem on the form. Participants were asked to complete the form as soon as possible after experiencing an interpersonal problem. “Interpersonal problems” are defined the same way as defined in Anderson, Goddard, and Howell’s (2009) study, “situations that present difficulty and where the solution is not immediately obvious.” On the problem-solving self-monitoring form, participants were provided with an open-ended question asking them to describe the situation in as much detail as possible (giving details such as when and where the situation happened, and what about the situation was challenging). They were also asked to rate the importance of the interpersonal problem to their own well-being.
on a scale from “0” (not at all important) to “7” (extremely important) as well as their level of state-anxiety before, during, and after the interpersonal problem on a scale from “0” (not at all anxious) to “7” (extremely anxious). For each problem, they were asked to explain what they did to try and solve the problem and to describe the outcome.

Convergent validity for the diary card task is demonstrated by its correlation with effectiveness scores on the MEPS (Anderson et al., 2009) and with sub-scales on the SPSI-RL (Anderson et al., 2011). However, this diary card method has also proven to have no relationship with the MEPS in other research (Anderson et al., 2011).

**Procedure**

Participants met with the student investigator or a trained research assistant for a 90-minute appointment. At the appointment, a research assistant greeted the participant and brought them into a private therapy room. The informed consent document (Appendix E) was thoroughly reviewed with the participant before proceeding with study procedures. Individuals who chose not to participate were thanked for their time. Upon consent, participants completed an online survey (associated with a different study) that included a trait-based measure of emotion regulation and a self-report measure of social problem-solving. A research assistant then administered MEPS. Upon completion of the MEPS the researcher assistant provided the participants with the instructions for the diary card. The specific administration for the MEPS and the specific instructions given for the diary cards are as follows:

**Administration for the Means-End Problem-Solving Task.** The research assistant administered the MEPS by reading the instructions aloud as well as reading each scenario aloud while the participant read along. Participants were asked to silently type their responses to each scenario and were encouraged to type at least one paragraph. Participants were instructed to alert
the research assistant when they were finished with each scenario so the research assistant could read the next scenario aloud as the participant followed along. After completing the MEPS, participants were instructed to create a unique identifier in order to link their data from session one to their responses on a diary card.

**Diary card instructions.** After participants completed the MEPS, the research assistant provided participants with the diary card, describing the instructions for completing the form. Participants were asked to fill out the diary card as soon as possible after they attempted to resolve a problem. Participants were asked to write at least a paragraph for their description of how they addressed the problem. Next, the research assistant and participant agreed on a time to meet within the next two weeks for the form to be returned. The research assistant emailed the participant the day before the scheduled meeting, reminding them of the appointment and asking if the form had been completed. If the participant responded saying they had not completed the form, the research assistant rescheduled the meeting to take place within the next two weeks. Again, before the rescheduled meeting, the research assistant would send the participant an email the day before reminding them of the appointment. At the meeting, participants brought their completed form and received extra credit for their participation in the study if desired.

**Coding Procedures**

**Coding the Means-Ends Problem-Solving Task.** Responses to the MEPS have been scored in various ways. Originally, the responses were scored based on relevancy of each task required to achieve the desired outcome (Platt & Spivack, 1975). In this study, the MEPS was scored for the number of relevant means (i.e., effective goal-directed means), irrelevant means (i.e., means that are ineffective or not goal-directed), and the effectiveness of each mean. Many researchers have coded responses to the MEPS by examining number of relevant steps and the
effectiveness of each step to accomplish the task (Anderson et al., 2009; Dennis, Astell, & Dritschel’s, 2012). Effectiveness of each step was scored using a Likert-scale ranging from “1” (not at all effective) to “7” (extremely effective) and using D’Zurilla and Goldfried’s (1971) criteria to determine effectiveness: a problem-solving step is effective if it increases desired and minimizes undesired short- and long-term goals and social consequences (see Appendix I for the coding manual). All means coded as irrelevant received an effectiveness score of zero. Relevant means and effectiveness were averaged across the four scenarios for each participant to produce total relevant means and effectiveness scores. The frequency of irrelevant means was calculated across the four scenarios for each participant to produce a total irrelevant mean score.

Scores for each problem were independently coded for inter-observer reliability. The student investigator and undergraduate research assistants used hypothetical data to initially train reliability. Once they obtained an intraclass correlation coefficient (ICC) of .70 or higher, they began coding real data. To reduce coder drift, bi-weekly coding meetings were held. A random selection of 20% of participants’ responses were used as a reliability check. ICCs were used to calculate inter-observer agreement among two independent coders. Interrater reliability for the variables ranged from .82 to .96 which is in the excellent range (Cicchetti, 1994). Refer to Table 2 for a more detailed summary of interrater reliability of the MEPS categories. The remaining scenarios were divided between coders to complete coding.

**Coding the diary card.** Anderson and colleagues (2009) coded the diary cards similarly to the MEPS by coding for relevant means and average effectiveness of means. However, they discontinued coding for relevant means because some of the problems recorded on the diary card could be effectively solved with few steps. In this study, diary cards were coded based on relevant means, irrelevant means, and effectiveness. Thus, the coding manual for the diary card task was
the same as the coding manual for the MEPS (see Appendix I). Similarly to the MEPS coding, relevant means and effectiveness were averaged across the four scenarios for each participant to produce total relevant means and effectiveness scores. The frequency of irrelevant means was calculated across the four scenarios for each participant to produce a total irrelevant mean score.

Scores for each problem were independently coded for inter-observer reliability. The diary card had participants report on various aspects of the problems they faced, but only the question asking participants to write about how they addressed the problem was scored to increase comparability between the MEPS and the diary card. To obtain inter-observer reliability, the student investigator (coder 1) and two undergraduate research assistants (coders 2 & 3) used hypothetical data initially to train reliability. Once they obtained an ICC of .70 or higher for each category, they began coding real data. To reduce coder drift, bi-weekly coding meetings were held. The student investigator and the undergraduate independent raters scored the same random selection of 20% of participants’ responses as a reliability check. The remaining participant responses were divided by three for each coder complete in order to finish coding for the rest of the sample. ICCs were calculated to determine inter-observer agreement among the three independent coders. Interrater reliability for the variables ranged from .82 to .97 which is in the excellent range (Cicchetti, 1994). ICC values between .60 and .75 are considered good and those between .75 and 1.0 are considered excellent. Refer to Table 2 for a more detailed summary of interrater reliability of the diary card categories.

Diary card responses were also categorized into different types of situations (see Appendix I). There were nine categories total. Eight of the categories were interpersonal situations (i.e., friends, family, significant other, school, work, living situation, financial, and other) in which the participant’s response required a reasonable amount of interacting with and communicating with
another individual. The ninth category was for responses related to practical or instrumental problem-solving in which the individual did not interact or communicate with another person (e.g., studying for an exam). To calculate the reliability check for diary card situation type, Fleiss’ kappa analysis was used. Fleiss kappa is used to assess the reliability of agreement when using more than two raters who are assigning categorical ratings to a number of items (McHugh, 2012). Landis and Koch (1997) suggests that kappa values between .81 and 1.00 are almost perfect. The kappa statistic for all items were almost perfect. See Table 3 for a more detailed summary of the kappa statistics for the situation types on the diary cards.

Table 2

*Interrater Reliability for MEPS and Diary Card Categories*

<table>
<thead>
<tr>
<th></th>
<th>Intraclass Correlations</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coder 1 &amp; 2</td>
<td>Coder 1 &amp; 3</td>
<td>Coder 2 &amp; 3</td>
</tr>
<tr>
<td><strong>MEPS Categories</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relevant</td>
<td>.96</td>
<td>.93</td>
<td>.95</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>.97</td>
<td>.94</td>
<td>.94</td>
</tr>
<tr>
<td>Irrelevant</td>
<td>.88</td>
<td>.87</td>
<td>.82</td>
</tr>
<tr>
<td><strong>Diary Card Categories</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relevant</td>
<td>.93</td>
<td>.94</td>
<td>.90</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>.92</td>
<td>.92</td>
<td>.86</td>
</tr>
<tr>
<td>Irrelevant</td>
<td>.91</td>
<td>.92</td>
<td>.84</td>
</tr>
</tbody>
</table>
Table 3

*Kappa Reliability for Situation Type on Diary Cards*

<table>
<thead>
<tr>
<th>Situation Type</th>
<th>Fleiss’ Kappa Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friends</td>
<td>1.00</td>
</tr>
<tr>
<td>Family</td>
<td>1.00</td>
</tr>
<tr>
<td>Significant Other</td>
<td>1.00</td>
</tr>
<tr>
<td>School</td>
<td>1.00</td>
</tr>
<tr>
<td>Work</td>
<td>.85</td>
</tr>
<tr>
<td>Living Situation</td>
<td>1.00</td>
</tr>
<tr>
<td>Financial</td>
<td>1.00</td>
</tr>
<tr>
<td>Other Interpersonal</td>
<td>.97</td>
</tr>
<tr>
<td>Instrumental/Practical</td>
<td>.82</td>
</tr>
</tbody>
</table>

**RESULTS**

**Descriptive Statistics**

Average, range, and standard deviations were calculated for most study measures, including most of the subscales of the measures included in the study (Table 4). The normative data for each study measure is also included in table four. For all measures, the normative data was generally based on a similar population to the population used in this study (e.g., undergraduate college students).
Table 4

*Average, Standard Deviation, and Range for Measures Included in the Study as well as the Measures’ Normative Data*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study Mean</th>
<th>SD</th>
<th>Measure Norm</th>
<th>Study Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPSI-R:L Positive Problem Orientation</td>
<td>102.75</td>
<td>13.75</td>
<td>86-114</td>
<td>77-131</td>
</tr>
<tr>
<td>SPSI-R:L Negative Problem Orientation</td>
<td>99.23</td>
<td>15.22</td>
<td>86-114</td>
<td>74-134</td>
</tr>
<tr>
<td>SPSI-R:L Problem Definition and Formulation</td>
<td>98.70</td>
<td>14.17</td>
<td>86-114</td>
<td>64-129</td>
</tr>
<tr>
<td>SPSI-R:L Generation of Alternative Solutions</td>
<td>103.33</td>
<td>15.34</td>
<td>86-114</td>
<td>70-136</td>
</tr>
<tr>
<td>SPSI-R:L Decision Making</td>
<td>98.17</td>
<td>19.03</td>
<td>86-114</td>
<td>56-137</td>
</tr>
<tr>
<td>SPSI-R:L Solution Implementation and Verification</td>
<td>99.64</td>
<td>14.85</td>
<td>86-114</td>
<td>64-132</td>
</tr>
<tr>
<td>SPSI-R:L Impulsivity/Carelessness Style</td>
<td>92.55</td>
<td>14.54</td>
<td>86-114</td>
<td>75-133</td>
</tr>
<tr>
<td>SPSI-R:L Avoidance Style</td>
<td>97.02</td>
<td>13.39</td>
<td>86-114</td>
<td>80-130</td>
</tr>
<tr>
<td>SPSI-R:L Rational Problem-Solving</td>
<td>99.63</td>
<td>15.24</td>
<td>86-114</td>
<td>64-136</td>
</tr>
<tr>
<td>SPSI-R:L Total</td>
<td>102.39</td>
<td>14.71</td>
<td>86-114</td>
<td>62-131</td>
</tr>
<tr>
<td>MEPS Relevant</td>
<td>3.60</td>
<td>1.77</td>
<td>3.35</td>
<td>0-8</td>
</tr>
<tr>
<td>MEPS Irrelevant</td>
<td>.80</td>
<td>1.37</td>
<td>--</td>
<td>0-7</td>
</tr>
<tr>
<td>MEPS Effectiveness</td>
<td>3.77</td>
<td>1.01</td>
<td>4.40</td>
<td>.89-.535</td>
</tr>
<tr>
<td>Diary Card Relevant</td>
<td>2.64</td>
<td>1.03</td>
<td>--</td>
<td>.75-.75</td>
</tr>
<tr>
<td>Diary Card Irrelevant</td>
<td>.92</td>
<td>1.4</td>
<td>--</td>
<td>0-6</td>
</tr>
<tr>
<td>Diary Card Average Effectiveness</td>
<td>3.9</td>
<td>.93</td>
<td>4.40</td>
<td>1.29-.533</td>
</tr>
<tr>
<td>DERS Nonacceptance</td>
<td>13.85</td>
<td>7.04</td>
<td>11.65</td>
<td>6-30</td>
</tr>
<tr>
<td>DERS Goals</td>
<td>15.57</td>
<td>5.11</td>
<td>14.41</td>
<td>5-25</td>
</tr>
<tr>
<td>DERS Impulse</td>
<td>10.75</td>
<td>5.28</td>
<td>10.82</td>
<td>6-28</td>
</tr>
<tr>
<td>DERS Awareness</td>
<td>14.65</td>
<td>5.16</td>
<td>14.34</td>
<td>6-26</td>
</tr>
<tr>
<td>DERS Strategies</td>
<td>16.84</td>
<td>7.11</td>
<td>16.16</td>
<td>8-39</td>
</tr>
<tr>
<td>DERS Clarity</td>
<td>11.06</td>
<td>3.75</td>
<td>10.61</td>
<td>5-19</td>
</tr>
<tr>
<td>DERS Total</td>
<td>82.71</td>
<td>25.90</td>
<td>77.99</td>
<td>42-146</td>
</tr>
</tbody>
</table>

Note. “- -” denotes a lack of information for that measure.

Descriptive statistics were also completed for some of the diary card variables.

Percentages were calculated to determine the types of problems individuals reported. Each participant was asked to write about four different scenarios that they faced within the month. Then, each situation was coded for problem type. With 51 participants there should be 204 situations to code total. However, 11 scenarios were left blank (5.4% of missing data), leaving...
193 scenarios to code. To address missing data, a missing data analysis was completed to determine the pattern of missingness. Little’s Missing Completely at Random (MCAR) test confirmed that the data was missing completely at random. Given that the situation types are categorical variables and only a small percentage is missing, the missing cases were ignored in the analysis. Researchers have reported this as one way to handle missing categorical data (Strauss, Rindskopf, & Falkin, 2001). A minority of participants reported experiencing practical problems (17.1%) and a majority of participants reported experiencing interpersonal problems (82.9%). Interpersonal problems reported from most to least common were related to family, friends, significant other, living situation/roommate, other interpersonal problems, school, work, and financial. Refer to table 5 for more details on the percentages of problem types reported on the diary card.

Table 5

Percentage of Problem Types Reported on Diary Card

<table>
<thead>
<tr>
<th>Situation Type (N = 193)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td>18.1%</td>
</tr>
<tr>
<td>Friends</td>
<td>17.6%</td>
</tr>
<tr>
<td>Significant Other</td>
<td>13.5%</td>
</tr>
<tr>
<td>Living situation/Roommate</td>
<td>10.4%</td>
</tr>
<tr>
<td>Other Interpersonal</td>
<td>9.3%</td>
</tr>
<tr>
<td>School</td>
<td>8.3%</td>
</tr>
<tr>
<td>Work</td>
<td>4.1%</td>
</tr>
<tr>
<td>Financial</td>
<td>1.6%</td>
</tr>
<tr>
<td>Practical</td>
<td>17.1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Situation Type (N = 193)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpersonal</td>
<td>82.9%</td>
</tr>
<tr>
<td>Practical</td>
<td>17.1%</td>
</tr>
</tbody>
</table>

Descriptive statistics also were completed on the latency variable of the diary cards in order to determine the extent to which diary cards were used as a form of EMA. The latency
variable consists of the number of hours from when a problem occurred to when the participant wrote about the problem in the diary card. In particular, the latency of reporting was collected to determine the extent to which the diary cards met the Stone and Shiffman (1994) definition of EMA regarding that the measure collects data on extremely current or recent states or behaviors. To address missing data, a missing data analysis was completed to determine the pattern of missingness. Little’s Missing Completely at Random (MCAR) test confirmed that the data was missing completely at random. A numerically large percentage of data was missing (ranging from 15.4% to 28.8% for each of the four problems recorded in the diary card). Expectation maximization is one method to fill in missing data but is typically recommended for when only a small percentage of data is missing. However, when the data is being used for descriptive statistics (not inferential statistics) and a large amount is missing, then expectation maximization can be appropriate and useful (Tabachnick & Fidell, 2007). The amount of time in hours between when the problem occurred and when the participants wrote about the problem in the diary card was calculated for each of the four problems. Then, an average latency time was calculated for each participant across the four problems. See table 6 for descriptive statistics of the average, median, mode, and range for the diary card duration variable.

Table 6

Mean, Median, Mode, and Range for the Diary Card Problem Latency Variable in Number of Hours.

<table>
<thead>
<tr>
<th></th>
<th>Latency in Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>52</td>
</tr>
<tr>
<td>Median</td>
<td>26</td>
</tr>
<tr>
<td>Mode</td>
<td>46.76</td>
</tr>
<tr>
<td>Range</td>
<td>2.38 – 991.75</td>
</tr>
</tbody>
</table>
Last, the number of days participants took to complete the diary card task (i.e., report on four different interpersonal problems) was recorded. As stated above, participants were given an initial deadline of two weeks to complete the diary card. If participants had not completed all four of the diary cards by the first two weeks, then they were given an additional two weeks to complete the diary cards. Thus, the expected task completion was roughly between 14 and 30 days. Refer to table 7 for the descriptive statistics of the average, median, mode, and range for the total diary card task completion in days.

Table 7

*Mean, Median, Mode, and Range for the Total Diary Card Task Completion in Days.*

<table>
<thead>
<tr>
<th>Total Task Completion in Days</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>21.03</td>
</tr>
<tr>
<td>Median</td>
<td>21.01</td>
</tr>
<tr>
<td>Mode</td>
<td>14</td>
</tr>
<tr>
<td>Range</td>
<td>8 – 108</td>
</tr>
</tbody>
</table>

**Primary Hypotheses**

**Hypothesis one.** It was hypothesized that the MEPS variables, SPSI-R:L variables, and diary card variables would not be correlated with each other or would be weakly correlated with each other, demonstrating that these measures are targeting different aspects of problem-solving. Weak correlations are considered to be .10 to .29, moderate .30 to .49, and large .50 to 1.0 (Cohen, 1988). To determine if the three measures of social problem-solving were measuring the same construct, bivariate correlations were calculated (see table 8). Statistical assumptions of bivariate correlation were tested including independence of observation, outliers, normality, and homoscedasticity. The SPSI-R:L Impulsive/Carelessness Style was found to be significantly negatively skewed. The SPSI-R:L Negative Problem Orientation, SPSI-R:L Avoidance Style,
MEPS irrelevant, and Diary Card Irrelevant variables were significantly positively skewed. Thus, these variables were transformed prior to the analysis.

There were two significant correlations among the social problem-solving variables. The MEPS Relevant variable was moderately positively correlated with the Diary Card Relevant variable ($r = .35, p < .05$). Thus, as relevant means used on the MEPS increases, relevant means used on the diary cards were likely to increase as well. The MEPS Irrelevant variable was weakly and negatively correlated with the SPSI-R:L Decision Making (DM) variable ($r = -.28, p < .05$). The SPSI-R:L DM variables reflects the ability to evaluate different solutions to a problem and choose which solution is the best to use to solve a given problem. Therefore, these results suggest that as one uses more irrelevant means on the MEPS then they are likely to report having more difficulty deciding on the best solution. None of the other social problem-solving variables were significantly associated with each other.

**Hypothesis two.** The second hypothesis was that the diary card and the MEPS variables including number of relevant means, irrelevant means, and effectiveness of means would be significantly different from each other. In particular, that the diary card variables would reflect fewer relevant means, lower effectiveness of means, and more irrelevant means than the MEPS. Paired samples t-tests were used to compare the number of relevant means, average effectiveness of means, and irrelevant means between the MEPS and the diary card. See table 9 for a summary.
Table 8

Summary of Pearson-Product Moment Correlations for Social Problem-Solving Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. MEPS Relevant</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. MEPS Effect</td>
<td>.44**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. MEPS Irrelevant</td>
<td>-.24</td>
<td>-.41**</td>
<td>-</td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>4. Diary Relevant</td>
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<td>.10</td>
<td>-.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Diary Effect</td>
<td>.11</td>
<td>.16</td>
<td>.01</td>
<td>.45**</td>
<td>-</td>
<td></td>
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<tr>
<td>6. Diary Irrelevant</td>
<td>-.12</td>
<td>-.22</td>
<td>.07</td>
<td>-.42**</td>
<td>-.73**</td>
<td>-</td>
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</tr>
<tr>
<td>7. SPSI-R:L NPO</td>
<td>.00</td>
<td>-.05</td>
<td>.03</td>
<td>.06</td>
<td>.11</td>
<td>.00</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. SPSI-R:L PPO</td>
<td>-.02</td>
<td>-.08</td>
<td>.04</td>
<td>-.09</td>
<td>-.24</td>
<td>.11</td>
<td>-.57**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>9. SPSI-R:L PDF</td>
<td>-.09</td>
<td>-.12</td>
<td>-.17</td>
<td>-.02</td>
<td>.03</td>
<td>-.11</td>
<td>-.23</td>
<td>.33*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. SPSI-R:L GAS</td>
<td>-.11</td>
<td>-.19</td>
<td>-.12</td>
<td>.13</td>
<td>.01</td>
<td>-.23</td>
<td>-.25</td>
<td>.38**</td>
<td>.72**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. SPSI-R:L DM</td>
<td>-.04</td>
<td>.03</td>
<td>-.28*</td>
<td>.06</td>
<td>.11</td>
<td>-.21</td>
<td>.03</td>
<td>.04</td>
<td>.67**</td>
<td>.66**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. SPSI-R:L SIV</td>
<td>.15</td>
<td>.09</td>
<td>-.14</td>
<td>.00</td>
<td>-.12</td>
<td>-.09</td>
<td>-.26</td>
<td>.49**</td>
<td>.67**</td>
<td>.53**</td>
<td>.56**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. SPSI-R:L ICS</td>
<td>.08</td>
<td>.24</td>
<td>-.09</td>
<td>.03</td>
<td>.20</td>
<td>-.26</td>
<td>-.52**</td>
<td>.13</td>
<td>.33*</td>
<td>.13</td>
<td>.24</td>
<td>.22</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>14. SPSI-R:L AS</td>
<td>.13</td>
<td>.02</td>
<td>-.10</td>
<td>.06</td>
<td>.11</td>
<td>-.03</td>
<td>.71**</td>
<td>-.41**</td>
<td>.09</td>
<td>-.08</td>
<td>.14</td>
<td>-.07</td>
<td>-.33*</td>
<td>-</td>
</tr>
<tr>
<td>15. SPSI-R:L RPS</td>
<td>-.03</td>
<td>-.05</td>
<td>-.22</td>
<td>.06</td>
<td>.01</td>
<td>-.19</td>
<td>-.20</td>
<td>.34*</td>
<td>.89**</td>
<td>.85**</td>
<td>.86**</td>
<td>.81**</td>
<td>.27</td>
<td>.03</td>
</tr>
<tr>
<td>16. SPSI-R:L Total</td>
<td>.06</td>
<td>.11</td>
<td>-.10</td>
<td>-.03</td>
<td>-.01</td>
<td>-.14</td>
<td>-.81**</td>
<td>.61**</td>
<td>.52**</td>
<td>.46**</td>
<td>.39**</td>
<td>.55**</td>
<td>.74**</td>
<td>-.54**</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. SPSI-R:L RPS</td>
<td>-</td>
</tr>
<tr>
<td>16. SPSI-R:L Total</td>
<td>.56**</td>
</tr>
</tbody>
</table>

*p<.05. **p<.01.
Relevant strategies. A paired samples t-test was used to compare relevant strategies used on the MEPS and relevant strategies used on the diary cards. All assumptions for paired samples t-test were met prior to the analyses. There was a significant difference in the scores for MEPS Relevant (M = 3.5, SD = 1.77) and Diary Card Relevant (M = 2.6, SD = 1.03) conditions; t(50) = 4.03, p = .01. Participants used more relevant means on the MEPS than on the diary card.

Average effectiveness of strategies. A paired samples t-test was used to compare average effectiveness of strategies used on the MEPS and average effectiveness of strategies used on the diary cards. All assumptions for dependent samples t-test were met prior to the analyses. There was not a significant difference in the scores for MEPS Effectiveness (M = 3.77, SD = 1.01) and Diary Card Effectiveness (M = 3.95 SD = .94) conditions; t(50) = -1.02, p = .314. Participants were used equally effective strategies on the two different types of measurement.

Irrelevant strategies. The Diary Card Irrelevant and the MEPS Irrelevant means violated the assumption of normality required to use a dependent samples t-test. On such occasions, a

<table>
<thead>
<tr>
<th>Variable</th>
<th>MEPS (n=51)</th>
<th>Diary Card (n=51)</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevant M</td>
<td>3.5</td>
<td>2.6</td>
<td>4.03</td>
<td>.01</td>
</tr>
<tr>
<td>SD</td>
<td>(1.77)</td>
<td>(1.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Effectiveness M</td>
<td>3.77</td>
<td>3.95</td>
<td>-1.02</td>
<td>.314</td>
</tr>
<tr>
<td>SD</td>
<td>(1.01)</td>
<td>(.94)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEPS (n=51)</td>
<td></td>
<td>Diary Card (n=51)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z-value</td>
<td></td>
<td></td>
<td>-.56</td>
<td>.58</td>
</tr>
<tr>
<td>p-value</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
non-parametric analysis such as the Wilcoxon Signed-Rank test can be used as an alternative (Pallant, 2010). Instead of comparing averages, the Wilcoxon converts scores to ranks and compares them at Time 1 and at Time 2 (Pallant, 2010). All assumptions for the Wilcoxon Signed-Rank test were met. The Wilcoxon Sign-Ranks Test indicated that MEPS Irrelevant median (Mdn = 0) and the Diary Card Irrelevant median (Mdn = 0) were not significantly different (Z = -.56, p = .58). Thus, participants did not use more or less irrelevant means on either the MEPS or the diary card task.

**Secondary Hypotheses**

Bivariate correlations were calculated on the variables included in the secondary analyses (see Table 10). Statistical assumptions of bivariate correlation were tested including independence of observations, outliers, normality, and homoscedasticity. The bivariate correlations suggest that participants who were anxious while social problem-solving during problem one where likely to be anxious during times two, three, and four as well. In addition, participants higher in effective problem-solving during problem one predicted effective problem-solving at time two, but not at times three or four. Furthermore, higher effectiveness during problem one was negatively correlated with anxiety during problem three. That is, individuals who were more effective at solving problem one, experienced less anxiety during problem three. Higher levels of anxiety during problem two were negatively correlated with effectiveness at problem three. In other words, individuals who experienced higher levels of anxiety during problem two, were likely to be less effective during problem number three.
Table 10

*Correlation Matrix for Variables Included in Secondary Hypotheses*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. DERS Total</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Anxiety During 1</td>
<td>.18</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Effectiveness 1</td>
<td>-.00</td>
<td>-.08</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Anxiety During 2</td>
<td>.10</td>
<td>.47**</td>
<td>.02</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Effectiveness 2</td>
<td>-.01</td>
<td>-.01</td>
<td>.51**</td>
<td>-.25</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Anxiety During 3</td>
<td>.22</td>
<td>.29*</td>
<td>-.32*</td>
<td>.31*</td>
<td>-.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Effectiveness 3</td>
<td>-.08</td>
<td>-.08</td>
<td>.11</td>
<td>-.33*</td>
<td>.16</td>
<td>-.01</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>8. Anxiety During 4</td>
<td>.17</td>
<td>.31*</td>
<td>-.20</td>
<td>.40**</td>
<td>-.25</td>
<td>.20</td>
<td>.05</td>
<td>-</td>
</tr>
<tr>
<td>9. Effectiveness 4</td>
<td>-.65</td>
<td>0.16</td>
<td>.01</td>
<td>-.06</td>
<td>.20</td>
<td>.16</td>
<td>.18</td>
<td>.02</td>
</tr>
</tbody>
</table>

* p<.05. ** p<.01.

**Hypothesis three.** It was hypothesized that state-anxiety (as measured by state-anxiety during an interpersonal problem on the diary card) interferes with social problem-solving effectiveness. A moderate amount of anxiety would predict performance of the diary card situations in terms of effectiveness. Too much or too little anxiety would hinder performance, resulting in a lower effectiveness of means. One-way Analysis of Variance was used to determine how state-anxiety levels influences effectiveness of problem solving in real-life scenarios. Tertiles were created to separate participants into groups based on their anxiety level (low = 0-2, moderate = 3-5, or high = 6-7) and the ANOVA was conducted to evaluate group differences on effectiveness of problem-solving. An alpha of .0125 was used as the Bonferroni correction to reduce family-wise error. Huijema (2011) recommends using the Bonferroni method when conducting multiple analyses within the same data set that uses the same dependent variable. A priori power analyses suggested a sample of 219 to achieve a power of 0.8
with a moderate effect size (.25). Please refer to Table 11 for a summary of ANOVA results for problems one, two, and three.

**Interpersonal problem one.** All assumptions were met for ANOVA, except the effectiveness variable was slightly negatively skewed. There was not a statistically significant difference between groups as determined by one-way ANOVA ($F(2, 48) = .323, p = .726$). The low anxiety mean was 3.79 (n = 8), moderate anxiety mean was 4.20 (n = 24), and severe anxiety mean was 3.92 (n = 19).

**Interpersonal problem two.** All assumptions were met for ANOVA, except the effectiveness variable was slightly negatively skewed. There was not a statistically significant difference between groups as determined by one-way ANOVA ($F(2, 48) = 1.76, p = .182$). The low anxiety mean was 4.46 (n = 7), moderate anxiety mean was 4.5 (n = 22), and severe anxiety mean was 3.8 (n = 22).

**Interpersonal problem three.** All assumptions were met for ANOVA, except the effectiveness variable was slightly negatively skewed. There was not a statistically significant difference between groups as determined by one-way ANOVA ($F(2, 48) = .313 p = .73$). The low anxiety mean was 3.87 (n = 6), moderate anxiety mean was 3.93 (n = 24), and severe anxiety mean was 3.5 (n = 21).

**Interpersonal problem four.** The homogeneity variance assumption for ANOVA was violated. To accommodate this violation, a Kruskal-Wallis H test was completed. Kruskal-Wallis H test is a non-parametric alternative to a one-way between groups analysis of variance in which scores are converted into ranks and the mean for each group is compared (Pallant, 2010). There was not a statistically significant difference between groups as determined by a Kruskal Wallis
test ($\chi^2 (2, N = 51) = 6.78, p = .034$). The low anxiety mean rank was 13.38 (n = 4), moderate anxiety mean rank was 30.70 (n = 26), and severe anxiety mean rank was 22.52 (n = 21).

Table 11

**One-Way ANOVA Results for Problems 1, 2, and 3**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>2</td>
<td>1.45</td>
<td>.724</td>
<td>.32</td>
<td>.73</td>
</tr>
<tr>
<td>Within groups</td>
<td>48</td>
<td>107.67</td>
<td>2.243</td>
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<tr>
<td>Total</td>
<td>50</td>
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</table>

<table>
<thead>
<tr>
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<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
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<td>5.10</td>
<td>2.55</td>
<td>1.76</td>
<td>.182</td>
</tr>
<tr>
<td>Within groups</td>
<td>48</td>
<td>69.49</td>
<td>1.45</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>74.60</td>
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<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>2</td>
<td>1.79</td>
<td>.89</td>
<td>.313</td>
<td>.733</td>
</tr>
<tr>
<td>Within groups</td>
<td>48</td>
<td>137</td>
<td>2.85</td>
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</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>138.79</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Hypothesis four.** It was hypothesized that emotion regulation would moderate the relationship between state-anxiety while solving a problem (as reported on the diary card task) and the effectiveness of problem-solving on that task. Since participants reported on four different real-life scenarios, the moderation analysis was calculated four times, once for each scenario. An alpha of .0125 was used as the Bonferroni correction to reduce family-wise error. An a priori power analysis using G*Power revealed that an estimate of 105 participants would be needed to detect a moderate effect size (.25) for a moderation analysis that included three predictors in order to achieve a power above .80 with an alpha of .0125. All assumptions for moderation were met for the analyses. All analyses yielded non-significant interactions. The moderation analysis for problem one was nonsignificant ($b = -.007$, $t(46) = -1.43$, $p = .16$). Similarly, the moderation analysis for problem two was nonsignificant ($b = -.004$, $t(46) = -.6106$, $p = .54$). The moderation analysis for problem three ($b = -.005$, $t(46) = -1.16$, $p = .25$) and problem four ($b = -.006$, $t(46) = -$
1.68, \( p = .099 \)) were also not significant. While these models are not significant, it appears that the models are approaching significance. Perhaps, with adequate power significance could be obtained.

**DISCUSSION**

The first aim of the study was to investigate different measures of social problem-solving. To do this, three different measures of social problem-solving were compared to each other: a self-report measure, an analogue task (i.e. the MEPS), and a diary card. It was hypothesized that these three types of measurements would not be correlated or would have weak correlations with each other because they would measure different aspects of social problem-solving.

Theoretically, because the MEPS is hypothetical in nature, it should measure one’s ability to generate effective steps to solve a problem. The diary card, however, should theoretically be a measure of implementation. Conceptually, the self-report measure assesses for various aspects of problem-solving including generation of solutions and solution implementation but is ultimately subject to more retrospective biases.

Partially consistent with the hypothesis one, two variables were associated with each other. There was a moderate correlation between relevant means used on the MEPS and relevant means used on the diary cards. In other words, the ability to generate more relevant means for hypothetical problems predicted the ability to implement relevant means in real life. This suggests that the ability to think of relevant solutions increases the chances that individuals are going to successfully carry out relevant solutions when actually faced with a problem. However, there was only a moderate correlation which implies that solutions to problems are not completely implemented as intended.
There was also a weak negative correlation between irrelevant means used on the MEPS and the decision-making variable on the self-report measure. This suggests that individuals who used a greater number of irrelevant means on the MEPS were more likely to report having greater difficulty evaluating different solutions to a problem and choosing which solution was the best to use to solve a given problem. Perhaps, a deficit in decision making can contribute to using ineffective strategies to solve social problems. Overall, the other variables showed no correlations with each other. The lack of significance and the weak and moderate correlations indicates that the MEPS, diary card task, and self-report measure are not indexing the same processes.

The goal of hypothesis two was to further determine differences between hypothetical problem solving using the MEPS and real-life problem-solving using diary card task as well as to examine the ecological validity of these two measures. Previous researchers have reported that the MEPS may be more of a measure of intent than how someone actually solves a social problem in real-life (Anderson et al., 2011). Knowing how to solve a problem is likely different from actually following through on the intentions to solve the problem. Also, knowing what you should do may be easier than actually implementing what you should do (e.g., you can know how to swim by reading about it, but that does not mean you can actually swim). Thus, it was hypothesized that, when compared to the MEPS, the diary card measure would have a higher level of irrelevant means and a lower level of average effectiveness of means and relevant means.

Contrary to hypothesis two, no differences were found between the MEPS and diary card on irrelevant means or average effectiveness. These results have three possible meanings. The first could be that the individuals in this sample did not have a deficit in generating effective
strategies (as measured by the MEPS) or a deficit in real-life implementation of effective strategies (as measured by the diary card). The second implication could be that the individuals experienced deficits in both generating effective strategies and implementation of effective strategies. Because there were no differences between these tasks, this means that people generally performed similarly on the MEPS and the diary card. That is, people’s hypothetical problem-solving was similar to how they would problem-solve in real-life. Thus, the third possible implication of these non-significant findings are that the MEPS and the diary card task, for this sample, could have been equally as sensitive at measuring social problem-solving with both measures actually having ecological validity. Alternatively, it could be said that because there were no differences, neither measure was ecologically valid because it would have been excepted that the diary card task would be a more challenging task and therefore would have resulted in more irrelevant mean and less effectiveness of means. Since there were no differences between groups, there is insufficient information to say which of these implications is the most accurate.

When comparing the current sample’s averages on the measures of social problem-solving given in this study to samples in similar studies, it is unclear which of the three above implications are most plausible. On the self-report measure of social problem-solving, the study sample’s average was 102.75, falling within the average range for a population of the same age (86-114) (D’Zurilla et al., 2002). In terms of performance on the MEPS, the study sample’s average of effectiveness of means (3.77) was numerically smaller compared to previous research that reported average effectiveness of means (4.40) in a control group comprised of college students (Anderson et al., 2009). In the current study, the average of relevant means (3.6) was greater than the control group from the previous study (3.35). When comparing the diary card
averages to Anderson and colleagues’ (2009) study, their control group had a higher average effectiveness score (4.40) than the present study (3.9). Given that the diary card and MEPS have been coded and calculated in various ways, there are no studies comparable to the current study that reported the average relevant and irrelevant means used on the diary card task or the average irrelevant means used on the MEPS. Thus, no comparisons can be made for these variables.

Consistent with hypothesis two, more relevant means were used on the MEPS than the diary card task. Such results could have a few possible implications. One implication could be that the diary card task was a more ecologically valid task when measuring implementation of relevant means. It was expected that participants would perform worse on the diary card because real-life situations that require actually implementing strategies are likely more difficult than thinking of strategies to implement in a hypothetical situation. Since there was a difference between the measures on relevant means, it does support the idea that the diary card captures something different that occurs in real-life than the MEPS. However, given that the problems experienced in real-life were vastly different from the standard four scenarios on the MEPS, it is also possible that some real-life situations can be solved in fewer relevant steps that are effective. This was pointed out by Anderson and colleagues (2009) as well when using diary cards and the MEPS in their study. Either way, this shows that the MEPS as standardly given does not reflect problem-solving in real-life in terms of the number of relevant means used.

It was hypothesized that state-anxiety interferes with social problem-solving effectiveness. In particular, it was hypothesized, that a moderate amount of anxiety would result in the highest level of performance on the diary cards in terms of effectiveness. Too much or too little anxiety would hinder performance, resulting in a lower level of effectiveness of means. Contrary to these hypotheses, level of state-anxiety did not statistically significantly impact the level of effectiveness
of strategies used during an interpersonal problem. However, there was insufficient power to detect a significant effect as calculated by a priori power analyses. In two instances, the results appeared to be approaching significance. In both of those instances, the trend was for the moderate state-anxiety group to have the highest effectiveness when problem-solving. The other two instances were not approaching significance, but numerical differences revealed that the moderate level of state-anxiety group also had been coded as more effective. Ultimately, there were no statistically significant effects.

Counter to hypothesis four, emotion regulation did not moderate the relationship between state-anxiety and the effectiveness of problem-solving on a given task. However, a few of the moderation analyses appeared to be approaching significance. An a priori power analysis suggested that the sample size in this study was not large enough to detect a significant effect. It is possible that with a larger sample size, a significant effect could be detected. However, these results suggest that there were no statistically significant interactions.

**Strengths and Limitations**

The study should be interpreted in the context of its strengths and limitations. One limitation of the study regards using a convenient sample of undergraduate college students who were average problem-solvers. It is possible that in a clinical sample of participants, the results of the study would be different because different symptom presentations are associated with different types of deficits in social problem-solving (Marx, Williams, & Claridge, 1992). Clinically depressed individuals tend to have difficulty with generating relevant means and implementing relevant means in real-life compared to a control group. On the other hand, clinically anxious individuals and control groups show no difference in the ability to generate relevant means, but clinically anxious participants have more difficulty with implementation in
real-life than the control group. Individuals with comorbid anxiety and depressive symptoms have been shown to experience more difficulty carrying out effective strategies in real-life than controls but did not show a deficit in generating relevant steps compared to controls (Anderson et al., 2009). In other words, it is possible that the sample in this study is representative of a control group in that they would be less likely to have a deficit in generation of means or implementation of means.

Another limitation reflects challenges with coding of the MEPS and diary cards. Some of the MEPS and diary card responses appear effective but were too ambiguous to determine how effective the response would be in an actual situation. For example, many participants’ responses to the MEPS or diary cards stated that they would/did “describe(d) my thoughts and feelings to my friend about the situation.” While that response seems effective, the way in which they describe their feelings and thoughts could range from being extremely ineffective to extremely effective. However, these vague responses do not provide coders with enough information, forcing them to score this response as moderately effective.

The extent to which the diary cards served as an ecologically valid measure is another limitation of the study. Indeed, the diary cards met a majority of the criteria for an EMA set by Stone and Shiffman (1994) in that data was collected from real-life environments, data was event-based, and data was collected using multiple assessments over-time. However, the diary cards may not have met the criteria that the data reflect extremely current or recent states of behaviors. Participants reported taking an average of two days to write about how they solved the problem after the problem occurred. Two days may be too long of a time period to be considered, “recent.” Further, research indicates that latency in recording data impacts the accuracy and reliability of the data (Taber-Doughty & Jasper, 2012).
The instructions given on the diary card task may be an additional limitation of the study in that these instructions may have limited the comparability between the MEPS and the diary card. Part of the instructions state that, “an interpersonal problem is defined as a situation that presents difficulty and where the solution is not immediately obvious.” Thus, participants may report on problems that are less interpersonal and more practical in nature (e.g., failing a test or getting a flat tire). In the current study, 17.1% of diary card responses were practical in that there were no social interactions involved in the problem or solution to the problem. It is possible that practical problems are less anxiety provoking and relatively easier to problem-solve than the type of interpersonal problems used on the MEPS.

One last limitation is that diary cards can be used as an intervention to increase social problem-solving ability. Therefore, participants may have been more effective social problem-solvers on the diary cards than they would have been otherwise. Self-monitoring has been shown to be an effective intervention for a variety of concerns including sleep disturbances (Todd & Mullan, 2014), excessive alcohol consumption (Michie et al., 2012), and obesity (Laitner, Minski, & Perri, 2016). It is possible that the diary cards served as some kind of self-monitoring of social problem-solving skills. The hypothesis that participants would perform worse on the diary card than the MEPS variables not holding up could be because participants made an improvement in social problem-solving because of the diary card tasks, resulting in non-significant differences between groups. In fact, a treatment created to enhance problem-solving skills, Problem-Solving Treatment (PST: D’Zurilla, 1986, D’Zurilla & Nezu, 1999; D’Zurilla, Nezu, & Nezu, 2006), uses diary cards as part of the intervention.

While this study has some limitations, there are some strengths as well. To the author’s knowledge, this is the first study that has compared the MEPS, diary card, and self-report
measure of social problem-solving in this way. This study uses two forms of measurement that are meant to be more ecologically valid than typical self-report measures: an analogue task and a diary card. Using ecological valid measures increases the likelihood that the dependent variable measure is generalizing to everyday life (Stone & Shiffman, 2011). The focus on measuring social problem-solving as opposed to measuring psychopathology also makes this study unique. Due to the current diagnostic system that uses the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5; American Psychiatric Association, 2013), there has been more of a syndromal emphasis (Hayes & Hofmann, 2017). That is, practitioners and researchers have mostly become concerned about the alleviation and psychopathology which has distracted them from taking into account outcomes related to meaningful living (Hayes & Hofmann, 2017). One such outcome of meaningful living can be social problem-solving ability as it pertains to interpersonal relationships.

**Future Research**

The findings of this study provide some insight for future researchers. Since there was a difference between the MEPS and diary card task on number of relevant steps to solve a problem, researchers who are interested in the number of relevant steps taken to solve a problem should consider using diary card methods. Diary card methods may be better to use than the alternative analogue task because they theoretically are a measure of problem-solving in real-life. Also, if researchers are interested in the difference between the ability to generate strategies and the ability to effectively implement those strategies, it would be interesting to have participants report how they think they should solve before attempting to solve it, then report how they actually solved the problem. In this study the scenarios on the MEPS were completely different than the scenarios that occurred in real-life. If one truly wants to compare the difference between
ability to generate solutions and the implementation of those solutions, then these two variables should be compared using the same problem. In addition, to improve the comparability between the MEPS and diary cards, researchers may also consider changing the directions to the diary card to more specifically define an “interpersonal problem,” as a problem that involves social interaction with another individual.

Future researchers may also want to consider recruiting a sample of people who have difficulty with problem-solving in order to reduce the possibility that participants are actually average problem-solvers who would perform similarly across tasks. Future researchers may want to recruit a clinical sample whose symptom presentation has strong associations with deficits in social problem-solving or at least recruit people who view themselves as poor social problem-solvers. In terms of the hypotheses regarding state-anxiety and emotion dysregulation, future researchers may want to re-test this hypothesis with a larger sample size.
REFERENCES


Appendix A

Oral Recruitment Script
Oral Recruitment Script

Hello, my name is ________________________, and I am here to invite you to participate in a study that is being conducted.

If you decide to participate, you will be asked to meet with a researcher in a lab in Wood Hall for two sessions. The first is to complete an online survey that will take 1 to 1.5 hours to complete. The online survey will ask you questions about your emotions, your daily habits, the types of relationships you tend to have, the way you solve problems, and other questions about yourself. At the end of the survey a researcher will administer a social problem-solving task to you. During this task you will be asked to write about how you would problem solve different hypothetical situations. After you complete this study, you will be asked to create a unique identifier. This unique identifier is used to link your data from this session to your data from the second session of the study. Then, you will be given a problem-solving self-monitoring form that asks you to report four social problems you faced during that time, and how you handled them along with other related questions. You will be asked to independently complete that form and to schedule an appointment within the next 2-4 weeks to return the form to the student investigator or research assistant. This second meeting will take less than 5 minutes. This meeting consists of you returning the form and receiving extra credit if desired.

All survey responses and your responses on the self-monitoring form are anonymous. While you make a unique identifier, this unique identifier is so convoluted that no one would be able to recognize any personal identifiers. You are never asked to include any personal identifiers such as your name, telephone number, or email address on any documents in this study. Participation in this study is completely voluntary and you can stop at any time without any effect on your grade in this class or your relationship with Western Michigan University or the Psychology Department.

Depending on your instructor, it may be possible to receive extra credit points for the time you spend participating in this study. Alternatively, your instructor may have additional methods for obtaining extra credit points. Please, check with your instructor regarding their extra credit policies.

If you are interested in learning more about the study, please feel free to take one of these sheets listing the email address where you can reach the student investigator. Thank you for your time! Have a good day!
Appendix B

Paper Flyers
Research Participants Needed!!!
Researchers at Western Michigan University are seeking individuals enrolled in courses at Western Michigan University to participate in a study about social problem solving.
If you are interested in learning more about participating in this study, please contact Dana Goetz. All information is private and confidential.
Thank you!

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Appendix C

Recruitment Slips
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Appendix D

PowerPoint Slide Content
RESEARCH PARTICIPATION OPPORTUNITY!
Researchers at Western Michigan University are seeking individuals enrolled in courses at WMU to participate in a study about social problem solving.
If you are interested in learning more about participating in this study, please contact Dana Goetz at dana.b.goetz@wmich.edu
All information is private and confidential.
Thank you!
Appendix E

Informed Consent
Below is more information about the study so that you can provide informed consent to participate. When you are done reading, you will be asked if you accept or decline to participate. If you accept, you will be directed to the survey.

Informed Consent
Western Michigan University
Department of Psychology

Principal Investigator: Amy Naugle, Ph.D.
Student Investigator: Dana B. Goetz, M.A.

Title of Study: A Transdiagnostic Model for the Development of Social Problem Solving Skills

You have been invited to participate in a research project that will serve as Dana Goetz’s dissertation. This consent document will explain the purpose of this study and will describe the time commitments, procedures used in the study, and the risks and benefits of participating. Please read this form and ask any questions if you need clarification.

What are we trying to find out in this study?
We are trying to learn more about the types of variables that contribute to the development of social problem-solving skills and what the best ways of measuring social problem solving are.

Who can participate in this study?
Students who are enrolled at Western Michigan University and are 18 years of age or older are eligible to participate.

Where will this study take place?
This study will take place in a private therapy room in Wood Hall. You will also be asked to complete a “social problem-solving self-monitoring form” independently outside of Wood Hall on your own time before returning it to a researcher in Wood Hall two to four weeks after completing session one of the study.

What will you be asked to do if you choose to participate in this study?
If you choose to participate in the study, you will be asked to complete a series of online questionnaires that ask questions about your personality, how you solve problems, and other questions about your daily life. At the end of the study, you will be asked to complete a social problem-solving task. This task asks you to write about how you would respond to different hypothetical interpersonal problems. A researcher will help administer this task by reading the instructions and scenarios out loud to you as you follow along and type your response. Then, you will be asked to create a unique identifier to link information from session one to session two. You will be given a
“social problem-solving self-monitoring” form to complete independently outside of wood hall. This form asks you to report about four social problems you face during the following two to four weeks. You will be asked to make a follow up appointment today to return your form approximately two weeks from now. You will receive and email the night before this appointment to confirm that you have completed the form. If you have not, then the session will be rescheduled for two weeks later for you to return the form. The second session the study involves you returning the form and receiving extra credit if desired. This second session should take approximately five minutes.

What is the time commitment for participating in this study?
In the first session completion of the questionnaires and problem-solving task will take approximately 1-1.5 hours to complete. The self-monitoring form that you are asked to complete within the next two to four weeks may take up to 20-60 minutes to complete, depending on how much detail you include or the types of problems you face. All time spent participating in this study will be compensated with extra credit.

What are the risks of participating in this study and how will these risks be minimized?
The risks associated with the present study are anticipated to be minimal. Any potential risk will be minimized by allowing you to cease participation if you become uncomfortable, and by ensuring that responses to all questionnaires are kept anonymous. All responses are anonymous and are not linked to any identifying information, and only study staff members have access to the completed measures. However, you will be asked to create a unique identifier. This unique identifier serves the purpose of linking your data from the first session to the second session. This unique identifier will still maintain your anonymity because it is so convoluted that no one would be able to connect it to any of her personal identifiers such as your name. You will never be asked to include any personal identifiers while completing this study such as your name, phone number, or email address.

What are the benefits of participating in this study?
There are no specific benefits to participating in the study other than knowing that you are contributing to a valuable piece of scientific research.

Are there any costs associated with participating in this study?
The only cost to the study is the time you are willing to spend completing the on-line survey and the self-monitoring form.

Is there any compensation for participating in this study?
Extra credit points may be offered for the time spent on the study at the discretion of your instructors.

How will the data in the study be used?
The data will be collected from Qualtrics and from a paper self-monitoring form. All data are stored in a secure database or a locked filing cabinet that only study staff
member have access to. The data will be analyzed as part of a dissertation. They may also be published in academic journals. No personal identifying information will be included in either journal articles or defense documents submitted to the faculty.

**What if you want to stop participating in this study?**
You are free to stop participation in this study at any time, for any reason. You will suffer no prejudice or penalty by your decision to stop your participation. Should you wish to stop participation in the study, you may simply exit from the on-line survey.

Should you have any questions prior to after the study, you can contact the primary investigator, Dr. Amy Naugle, at (269) 387-4726, or the student investigator, Dana Goetz, at (269) 387-4485 or at dana.b.goetz@wmich.edu. You may also contact the Chair of the Human Subjects Institutional Review Board at (269) 387-8293 or the Vice President for Research at (269) 387-8298.

This study was approved by the Western Michigan University Human Subjects Institutional review Board (HSIRB) on March 21, 2017. Please do not participate in this study after March 20, 2018.

I have read this informed consent document. I understand the risks and benefits, and I agree to take part in this study.
Participating in this survey online indicates your consent for use of the answers you supply.
Appendix F

Demographic Questionnaire
1. What is your age? ___________ years

2. Gender
   - 01 Male
   - 02 Female

3. What is your relationship status?
   - 01 Single and not in a dating relationship
   - 02 Single and currently dating/in a relationship
   - 03 Engaged
   - 04 Living with my partner
   - 05 Married
   - 06 Separated/Divorced
   - 07 Widowed

4. What best describes your race/ethnicity?
   - 01 Asian
   - 02 African American
   - 03 Hispanic
   - 04 Native American/Alaska Native
   - 05 Caucasian
   - 06 Other: ___________

5. If you are a student, what is your class standing upon entering this semester?
   - 01 Freshman
   - 02 Sophomore
   - 03 Junior
   - 04 Senior
   - 05 Graduate Student/Graduate Special
   - 06 Non-degree seeking student

6. What is your current yearly income?
   - 01 $15,000 or less
   - 02 $15,001 – $25,000
   - 03 $25,001 – $35,000
   - 04 $35,001 – $50,000
   - 05 over $50,000

7. If you are a student, what do you think your family’s income was growing up?
01 $15,000 or less
02 $15,001 – $25,000
03 $25,001 – $35,000
04 $35,001 – $50,000
05 over $50,000

8. Where do you currently reside?

01 House
02 Apartment
03 Duplex
04 Residence Hall (dormitory)
05 Fraternity or Sorority House
06 Other: __________________
Appendix G

Difficulties in Emotion Regulation Scale (DERS)
Difficulties in Emotion Regulation Scale (DERS)

Response categories:

1. Almost never (0-10%)
2. Sometimes (11-35%)
3. About half the time (36-65%)
4. Most of the time (66 – 90%)
5. Almost always (91-100%)

1. I am clear about my feelings.
2. I pay attention to how I feel.
3. I experience my emotions as overwhelming and out of control.
4. I have no idea how I am feeling.
5. I have difficulty making sense out of my feelings.
6. I am attentive to my feelings.
7. I know exactly how I am feeling.
8. I care about what I am feeling.
9. I am confused about how I feel.
10. When I’m upset, I acknowledge my emotions.
11. When I’m upset, I become angry with myself for feeling that way.
12. When I’m upset, I become embarrased for feeling that way.
13. When I’m upset, I have difficulty getting work done.
14. When I’m upset, I become out of control.
15. When I’m upset, I believe that I will remain that way for a long time.
16. When I’m upset, I believe that I’ll end up feeling very depressed.
17. When I’m upset, I believe that my feelings are valid and important.
18. When I’m upset, I have difficulty focusing on other things.
19. When I’m upset, I feel out of control.
20. When I’m upset, I can still get things done.
21. When I’m upset, I feel ashamed with myself for feeling that way.
22. When I’m upset, I know that I can find a way to eventually feel better.
23. When I’m upset, I feel like I am weak.
24. When I’m upset, I feel like I can remain in control of my behaviors.
25. When I’m upset, I feel guilty for feeling that way.
26. When I’m upset, I have difficulty concentrating.
27. When I’m upset, I have difficulty controlling my behaviors.
28. When I’m upset, I believe there is nothing I can do to make myself feel better.
29. When I’m upset, I become irritated with myself for feeling that way.
30. When I’m upset, I start to feel very bad about myself.
31. When I’m upset, I believe that wallowing in it is all I can do.
32. When I’m upset, I lose control over my behaviors.
33. When I’m upset, I have difficulty thinking about anything else.
34. When I’m upset, I take time to figure out what I’m really feeling.
35. When I’m upset, it takes me a long time to feel better.
36. When I’m upset, my emotions feel overwhelming.
Appendix H

Means-Ends Problem-Solving Task (MEPS)
Instructions
During this task, you will be presented with 6 short stories to read. The first is an example, and the second is a practice scenario. The following scenarios are what will be scored for part of the study, so please do your very best. In each of the stories, a situation will be outlined and a problem will emerge. The story will then jump to a positive outcome. The middle section of the story is missing—what the main character from the story (you) did to solve the problem. Your goal is to fill this missing part by writing in the text box describing it in the form of a short story. In your story, you will have to describe the best thing you could do to solve the problem in order to reach a positive outcome that is maximized for all participants involved. For each story, you will hear a beginning and an ending. Your task is to imagine the middle part of the story that connects the beginning with the ending. Please write at least one paragraph (500 characters) for each scenario.

Example. You are at a meeting and are listening to people talking about ways to improve a number of things in the department. (plan)

You want to say something important and also get a chance to be the spokesperson. (problem)
The story ends with you being chosen as the spokesperson and then making a speech. (happy ending).

What is missing it the “middle,” namely, how you solved the problem, how you achieved your goal. Now you would have to describe the best way for you to solve that problem to achieve the happy ending for all participants involved;

You would have to start with the meeting where you wanted a chance to take the representative post.

Practice Scenario. You are having trouble getting along with your boss. You are very unhappy about this.

Start the story where you are not getting along with your boss.

Finish the story with your boss liking you.

Scenario 1. You have started to notice that one of your friends is avoiding you. You try to think of anything you could have said or done to upset them. The more you think about it, the more worried you become. You begin to panic, fearing that you may have unwittingly done something terrible. When you go out, you worry you might bump into your friend, causing them to be further upset. The story ends when you and your friend are getting along and happy once again.

Start the story the moment you worry your friend is avoiding you.
Finish the story when you and your friend are getting along and happy once again.

Scenario 2. You and your partner have been in a very happy relationship for six months. Recently, you both decided to move in together. Since then, you and your partner have been arguing regularly. With each fight, you feel more down and hopeless about the relationship. You feel like neither of you can
communicate your feelings without both of you ending up in tears. The story ends when the issues within your relationship have been resolved.

Start the story the moment you feel down/hopeless about the relationship.

Finish the story when the issues within your relationship have been resolved.

**Scenario 3.** Your best friend has recently found a new partner. Since they started going out, your friend has been spending less and less time with you. To make matters worse, you have discovered that you and the new partner do not get along at all. You start to wonder if you are losing your best friend. You start to feel like your friend is abandoning you which makes you feel increasingly sad and lonely. You wonder if your friendship will ever be the same again. The story ends with you and your friend maintaining a supportive relationship.

Start the story the moment you feel sad about the situation with your friend.

Finish the story with you and your friend maintaining a supportive relationship.

**Scenario 4.** You have just moved into a new area today, and you do not know anyone. You want to have friends in the area. The story ends with you having many good friends and feeling at home in the area.

Start the story with you in your room immediately after arriving to the new area.

Finish the story with you feeling at home and like you have started making friends.
Appendix I

Means-Ends Problem-Solving Task & Diary Coding Description
1. Relevant means: A relevant means was scored for each individual, discrete and active step taken by any character which was effective in enabling the story’s protagonist to reach the given resolution or to overcome an obstacle preventing the protagonist from reaching the goal. A relevant means constituted a concrete action.

   Examples: "he asked why they were mad" "he went to talk to the teacher after class" "he apologized to her" "she spoke to her guidance counselor about it"

   If a participant created a more specific problem and then attempted to rectify it, that was scored as a relevant mean.

   Example: "she heard that her teacher thought she wasn't trying her best so she attended extra help sessions"

2. Ineffective means: An irrelevant means was scored for any step which was ineffective within the context of the story or irrelevant to the protagonist reaching the stated goal.

   Any escape behaviors or passive steps such as crying (only code when escape of passive attempt), wishful thinking, and hoping constituted an irrelevant mean. Thus, the participant attempted to handle the problem, but did not do so effectively. In other words, the participant tried to face and address the problem, but did not take a productive approach. Blaming someone else is considered irrelevant or bad apologies (e.g., “I apologize because I got mad because you made me mad). Lying to avoid a situation is an example.

   Examples: “she cried by the phone;” “she waited for him to call;” “She hoped he would apologize to her” “I am obsessing over it”

Rate each step on effectiveness of using a likert-scale ranging from “0” (ineffective) to “7” (extremely effective), keeping in mind that a problem-solving step is effective if it increases desired and minimizes undesired short- and long-term goals and social consequences
0 = Ineffective
1 = Barely effective
2 = A little effective
3 = Somewhat effective
4 = Effective
5
6 = Very effective
7 = Extremely effective

Coding Situation Type on Diary Card

INTERPERSONAL
Friends = 1 (note: if the roommate is also a friend and the problem is more about their friendship then code friends instead. E.g., mediating fights with mutual friends).
Family = 2
Significant other = 3
School = 4 (There must be some level of interpersonal conflict/social interactions. E.g., problems with group projects, studying, skipping class)
Work = 6 (anything related to having to communicate with a boss)
Living situation/roommate/neighbor = 7 (e.g., something related to dishes, not cleaning, making loud noises)
Financial = 8
Other = 10 (e.g., being homesick, dealing with acquaintances, health problems)

INSTRUMENTAL/PRACTICAL
Practical = 9 (e.g., car issues, issues with space, financial problems, basically when there is not much interpersonal/social related or it’s not the focus, studying by yourself for tests, health related)

If a category seems to be multiple types, look at the solution to the problem and choose the category that the participant is focusing on more with the solution.
Appendix J

Social Problem-Solving Inventory- Revised Long Version (SPSI-R:L)
Instructions

Below are some ways that you might think, feel, and act when faced with PROBLEMS in everyday living. We are not talking about the common hassles and pressures that you handle successfully every day. In this questionnaire, a problem is something important in your life that bothers you a lot but you don't immediately know how to make it better or stop it from bothering you so much. The problem could be something about yourself (such as your thoughts, feelings, behavior, appearance, or health), your relationships with other people (such as your family, friends, teachers, or boss), or your environment and the things that you own (such as your house, car, property, money). Please read each statement carefully and choose one of the numbers below which shows how much the statement is true of you. See yourself as you usually think, feel, and act when you are faced with important problems in your life these days. Put the number that you choose on the line before the statement.

0 = Not at all true of me
1 = Slightly true of me
2 = Moderately true of me
3 = Very true of me
4 = Extremely true of me

___ 1. I worry too much about my problems instead of trying to solve them.

___ 2. I feel afraid when I have important problems.

___ 3. When making decisions, I do not carefully check all my options.

___ 4. When making decisions, I do not think about the effects that each option can have on others.

___ 5. When solving problems, I think of different ideas and combine some to make a better solution.

___ 6. I feel unsure of myself when making important decisions.

___ 7. When my first attempt to solve a problem fails, I believe if I don't give up, I will eventually succeed.

___ 8. When I have a problem, I act on the first idea that comes to me.

___ 9. I believe that my problems can be solved.

0 = Not at all true of me
1 = Slightly true of me
2 = Moderately true of me
3 = Very true of me
4 = Extremely true of me

  __ 10. I wait to see if a problem goes away before trying to solve it myself.
  __ 11. When solving problems, I try to find out what is keeping me from getting what I want.
  __ 12. When my first efforts to solve a problem fail, I get very frustrated.
  __ 13. I doubt that I can solve difficult problems no matter how hard I try.
  __ 14. I put off solving problems for as long as possible.
  __ 15. I do not take the time to check how well a solution worked.
  __ 16. I go out of my way to avoid dealing with problems.
  __ 17. Difficult problems make me very upset.
  __ 18. When making decisions, I try to predict the pros and cons of each option.
  __ 19. I like to deal with problems as soon as possible.
  __ 20. I try to be creative and think of original solutions to problems.
  __ 21. When solving problems, I go with the first good idea that comes to mind.
  __ 22. When solving problems, I cannot think of many ideas.
  __ 23. I avoid thinking about problems instead of trying to solve them.
  __ 24. When making decisions, I think about the short-term and long-range outcomes of each option.
  __ 25. After carrying out a solution, I check to see what went right and what went wrong.
  __ 26. After trying to solve a problem, I check to see how much I feel better.
  __ 27. I practice a solution before carrying it out to improve my chances of success.
  __ 28. I believe I can solve difficult problems on my own if I try hard enough.

0 = Not at all true of me
1 = Slightly true of me
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4 = Extremely true of me

__ 29. When I have a problem, I get as many facts about it as possible.
__ 30. I put off solving problems until it is too late to do anything about them.
__ 31. I spend more time avoiding my problems than solving them.
__ 32. When I have a problem, I get so upset that I cannot think clearly.
__ 33. Before trying to solve a problem, I set a goal so I know exactly where I am going.
__ 34. When making decisions, I do not take the time to think about the pros and cons of each option.
__ 35. When I fail to solve a problem, I try to find out what went wrong and then I try again.
__ 36. I hate solving problems.
__ 37. After I carry out a solution, I check to see how much the problem has gotten better.
__ 38. I try to see my problems as challenges.
__ 39. When solving problems, I think of many different options.
__ 40. When making decisions, I weigh the outcomes of each option.
__ 41. When I have an important problem, I get depressed and don't do anything.
__ 42. I go to someone else for help in solving difficult problems.
__ 43. When making decisions, I think about the effects of each option on my feelings.
__ 44. When I have a problem, I look for those things around me that might be causing it.
__ 45. When making decisions, I go with my "gut feeling" without thinking about what will happen.
__ 46. When making decisions, I use a system to help me pick the best option.
__ 47. When solving a problem, I keep my goal in mind at all times.

0 = Not at all true of me
1 = Slightly true of me
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4 = Extremely true of me
48. I look at problems from different angles.

49. When I don't understand a problem, I try to find out more about it.

50. I get discouraged and depressed when my first efforts to solve a problem fail.

51. I do not take the time to check out why a solution did not work.

52. I am too quick to act when making decisions.
Appendix K
Diary Card
An interpersonal problem is defined as a situation that presents difficulty and where the solution is not immediately obvious. Please fill out the form as soon as possible after the interpersonal problem has occurred.

**Interpersonal Problem #1**

Date the interpersonal problem occurred: ___________________________

Time the interpersonal problem occurred: ___________________________

Date interpersonal problem was recorded: ___________________________

Time interpersonal problem was recorded: ___________________________

Describe the problem:

What happened?

What about the situation was challenging?

Explain what you did to try and solve the problem **(please try to write at least one paragraph):**

Describe the outcome:

Rate the importance of this interpersonal problem to your own well-being

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**Interpersonal Problem #2**
Date the interpersonal problem occurred: ___________________________
Time the interpersonal problem occurred: ___________________________
Date interpersonal problem was recorded: ___________________________
Time interpersonal problem was recorded: ___________________________

Describe the problem:
What happened?

What about the situation was challenging?

Explain what you did to try and solve the problem (please try to write at least one paragraph):

Describe the outcome:

Rate the importance of this interpersonal problem to your own well-being

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**Interpersonal Problem #3**
Date the interpersonal problem occurred: ___________________________
Time the interpersonal problem occurred: __________________________
Date interpersonal problem was recorded: __________________________
Time interpersonal problem was recorded: __________________________

Describe the problem:
What happened?

What about the situation was challenging?

Explain what you did to try and solve the problem **(please try to write at least one paragraph)**:

Describe the outcome:

Rate the importance of this interpersonal problem to your own well-being

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**Interpersonal Problem #4**

Date the interpersonal problem occurred: ___________________________

Time the interpersonal problem occurred: ___________________________

Date interpersonal problem was recorded: ___________________________

Time interpersonal problem was recorded: ___________________________

Describe the problem:

What happened?

What about the situation was challenging?

Explain what you did to try and solve the problem (please try to write at least one paragraph):

Describe the outcome:

Rate the importance of this interpersonal problem to your own well-being

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Appendix L

HSIRB Approval Letter
Date: March 21, 2017

To: Amy Naugle, Principal Investigator
   Dana Goetz, Student Investigator for thesis

From: Daryl Gardner-Bonneau, Ph.D., Vice Chair

Re: HSIRB Project Number 17-02-15

This letter will serve as confirmation that your research project titled “A Transdiagnostic Model for the Development and Maintenance of Social Problem Solving” has been approved under the expedited category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may only be conducted exactly in the form it was approved. You must seek specific board approval for any changes in this project (e.g., you must request a post approval change to enroll subjects beyond the number stated in your application under “Number of subjects you want to complete the study”).” Failure to obtain approval for changes will result in a protocol deviation. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

Reapproval of the project is required if it extends beyond the termination date stated below.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: March 20, 2018