

9-16-2013

Locus of control and quality of life in individuals with schizotypy

Rachael Paulbeck

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LOCUS OF CONTROL AND QUALITY OF LIFE IN INDIVIDUALS WITH
SCHIZOTYPY

By

Rachael M. Paulbeck

A Thesis

Submitted to the
Department of Psychology
College of Liberal Arts and Sciences
In partial fulfillment of the requirement
For the degree of
Master of Arts in Clinical Mental Health Counseling
At
Rowan University
July 2013

Thesis Chair: Thomas Dinzeo, PhD.

Acknowledgments

This author would like to acknowledge the contributions of Thomas Dinzeo, Ph.D. and David Angelone, Ph.D. for their assistance and feedback in the process of constructing and completing this study.

Abstract

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SCHIZOTYPY

2013/07

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Master of Arts in Clinical Mental Health Counseling

The present study collected data from 200 undergraduate students (106 male, 94 female) and sought to examine the relationship between levels of stress, cognitive processes related to stress management (Locus of Control- LOC; Sense of Coherence; SOC), and quality of life (QOL) across varying levels of risk for developing schizophrenia. Results indicated that high-risk individuals are significantly more likely to have an external locus of control ($F=4.121, p=.018$) supporting hypothesis 1. Counter to our second hypothesis, locus of control was not directly associated with QOL. However, LOC was correlated with both stress and level of risk for schizophrenia which (in turn) were both correlated with QOL. Thus, there is some tentative evidence that LOC may be indirectly related to QOL, although future research is needed to verify this possibility. Finally, SOC did not act as a moderator between QOL and LOC (hypothesis 3). Overall, the mixed findings of this study provide some insight into mechanisms behind stress appraisal and their subsequent effects on quality of life. Interventions designed for high-risk populations that target an individual's stress appraisal process (particularly SOC) may aid in increasing an individual's resiliency towards stressors, supporting greater quality of life levels and overall prognosis.

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Chapter 1

Introduction

Prevention has been a major focus of research for the schizophrenia-spectrum conditions since the costs associated with schizophrenia are exceedingly high (Ascher-Svanum et al., 2010). Treatment costs associated with psychotic relapse for society may be up to \$2 billion per year in the U.S. (Almond, Knapp, Francois, Toumi & Brugha, 2004). Overall treatment costs have reported to be between 1.5% and 3% of total health care budgets (not including welfare, housing, and criminal justice agencies) (Knapp & Razzouk, 2008). In addition to the fiscal cost related to treating psychosis, the development of psychotic illness also takes a tremendous toll on the health and wellbeing of the individual. Some researchers have attempted to identify factors that contribute to symptom development and relapse in order to develop early interventions that address problems before they become clinically significant. Factors targeted for prevention include: high levels of stress, poor adaptation to stressors, and poor insight (understanding of one's illness) (Landsverk, 1998). Relapse prevention methods that target psychological factors known to facilitate recovery and improve the prognosis of individuals with schizophrenia may help buffer against the deleterious effects of schizophrenia. Two promising potential targets for intervention factors include locus of control and sense of coherence. Examining the role of these factors on the management of stress and quality of life may help in the development of more targeted interventions for individuals with schizotypy. The following paper intends to expand upon these issues and explore the relationship of these variables of risk for schizophrenia.

The term “schizophrenia-spectrum” describes a range of phenomena (from sub-clinical to severe) that are related to the syndrome of schizophrenia. The term *schizotypy* is commonly used to describe phenomena related to an elevated risk for schizophrenia, including magical ideation, excessive social anxiety, and physical anhedonia (Vollema & Hoijtink, 2000). These characteristics are commonly organized into three separate dimensions including positive, negative, and disorganized (Schurhoff, Laguerre, Szoke, Meary, & Levober, 2005; Vollema & Hoijtink, 2000). These dimensions serve to categorize various traits found within schizotypy. Positive traits include psychotic-like perceptions and magical thinking while negative traits can include introversion and anhedonia. Lastly, the disorganized dimension can consist of social anxiety or other cognitive complaints (Vollema & Hoijtink, 2000). The three dimensions are characteristically similar to the three symptom clusters found within schizophrenia (Schurhoff et al., 2005).

One of the major etiological theories of schizophrenia is the diathesis-stress model (Walker & Diforio 1997; Walker, Mittal, & Tessner, 2008). This theory states that stress may interact with an individual’s genetic risk for developing schizophrenia leading to the manifestation of a psychotic disorder. According to this theory, high levels of stress due to the occurrence of negative life events or a heightened sensitivity to stressful events can quicken the onset of a first episode (Walker & Diforio, 1997). The diathesis-stress model is highly relevant for research involving individuals that are believed to have a greater risk for developing schizophrenia. An increase in symptom severity, a first psychotic episode, or relapse is often seen after a series of stressful events. Therefore,

managing stress has been an important part of interventions involving schizophrenia-spectrum conditions (Mahgerefteh, Pierre, & Wirshing, 2006).

One concept related to stress that has become increasingly important in the assessment of overall outcome, as well as acting as a protective agent against the development of schizophrenia and symptomatic relapse, is quality of life. QOL involves a person's sense of satisfaction and well-being with their life (Ruhrmann, Paruch, Bechdolf and Pukrop et al., 2008). Lower levels of QOL are generally related to increased level of psychopathology or distress, including phenomenon such as the presence of prominent negative symptoms, depression, side effects of medication, emotional or physical distress, low levels of social support, and prolonged illness or hospitalization (Bhandari 2012; Cotton, Gleeson, Alvarez-Jimenez, & McGorry, 2010; Ritsner, Kurs, Ponizovsky, & Hadjez, 2004). The assessment of QOL in patients allows mental health professionals to monitor the patient's perception of well-being in their everyday life and whether or not current treatments are related to an increase in well-being (Rocca, Castanga, Mongini, Montemangi & Bogetto, 2009). Overall, increasing a patient's QOL throughout treatment is associated with overall treatment success, improved prognosis, and treatment adherence. Given the number of consequences associated with low QOL, monitoring an individual's level of wellbeing/QOL should be an important goal in the prevention of symptom development and ensuring positive treatment outcomes.

While less frequently researched, cognitive variables may also be related to QOL and stress-appraisal in the schizophrenia-spectrum conditions. One example is locus of control (LOC) which involves the degree that an individual attributes various events to internal (personal) or external (environmental) factors (Kostka & Jachimowicz, 2010).

Internal LOC involves a belief that successes or failures are a direct result of behaviors directly under their personal control. Alternatively, individuals with an external LOC are more likely to attribute events and outcomes as part of other people, chance or other factors “external” to themselves (Hayley, Drake, Bentall, & Lewis, 2008). Research suggests that those with certain mental disorders, such as anxiety and depression, experience impairments in perceived control, and how psychologically healthy individuals are more likely to have a greater internal LOC than non-healthy individuals (Roddenberry & Renk, 2010). Furthermore, individuals who have a greater internal LOC demonstrate greater adaptability to a given situation in comparison to individuals who feel as though they are not in control. Individuals with greater levels of internal LOC are also more likely to take charge of a physical illness, and engage in help seeking behavior (Haley, 2003; Roddenberry & Renk, 2010). Thus, the LOC orientation of an individual may be related to willingness to seek treatment, and willingness remain in in treatment which act as protective factors for quality of life (Ascher-Svanum, Zhu, Faries, et al. 2010). Conversely, those who have a greater external LOC are more reactive to stress, both biologically and psychologically, than those with a primary internal LOC orientation (Armitage, 2003; Bellini, 2004; Haley, et al., 2008; Roddenberry & Renk, 2010; Walker, & Kestler, 2004). Therefore, an internal LOC may indirectly serve as a protective factor from stress, while an external LOC may act as a risk factor against help-seeking behavior , stress (Bellini, 2004), and lower quality of life. (Roddenberry & Renk, 2010).

Additional research is needed to evaluate whether this association is present in those with schizophrenia-conditions and whether or not this cognitive attribution style is associated with quality of life.

Another cognitive variable related to stress management is sense of coherence (SOC) which involves how well an individual manages and adapts to stressors. SOC includes characteristics such as manageability, comprehensibility, and meaningfulness (Bengtsson-Tops, Brunt, & Rask, 2005). Manageability is described as how an individual perceives their ability to adapt and how well they can utilize their internal and external resources to cope with any given stressor. The second component, comprehensibility, represents how well an individual can understand various stimuli in a clear and organized way. Lastly, meaningfulness represents how much an individual attributes importance and worth to various experiences. Higher levels of SOC (across these three sub-components) are related to adaptive stress management regardless if the stressors are internal or external in nature (Bengtsson-Tops et al., 2005).

As discussed, an individual may benefit from having a greater internal LOC as it has been associated with a lower stress response (Kostka & Jachimowicz, 2010; Landsverk, 1998; Roddenberry & Renk, 2010). Increases in adaptive coping skills have been shown to improve health outcomes, increase adherence to treatment and medication, lower rates of relapse, reduce symptoms, improve functioning and increase health seeking behavior. As part of the sense of coherence (SOC) theory, those with high levels of SOC are more likely to deem stressful stimuli as non-stressful or irrelevant because of a higher level of perceived adaptability (Landsverk, 1998). Thus, it has been reasoned that sense of coherence may underlie differential responses to stress in individuals who may otherwise have the same LOC (Kostka & Jachimowicz, 2010). Understanding the role of SOC may help to provide further insight as to how an individual may perceive and react to stressful events. These findings are particularly interesting for the individuals

with or at risk for psychosis due to the tendency for this population to have a greater stress response (Renwick, Jackson, Turner, Sutton, Foley, McWilliams, Kinsella et al, 2009; Walker, Mittal & Tessner, 2008) as well as a greater tendency to have an external LOC (Hayley, 2008) and low levels of QOL starting from the onset of their psychosis (or before) as compared to healthy individuals (Ritsner et al, 2004).

The relationship between these cognitive variables and stress may be particularly relevant for those with high levels of schizotypy. Often within this particular population are stressful events perceived as less manageable and controllable as compared to healthy control subjects (Renwick, et al. 2009). Research suggests that greater feelings of uncontrollability and unmanageability of the life events is related to greater overall levels of stress (Renwick et al., 2009). Thus, sense of control and manageability may be an important factor that contributes to levels of stress and QOL in those at-risk for schizophrenia. Research has shown that having a sense of control can help buffer the deleterious psychological or biological effects of stress (Renwick, et al., 2009).

This study aims to examine an individual's subjective stress response and how its management (LOC/SOC) relates to quality of life. In support of previous research, this study aims to find similar relationships among the constructs within the general sample. However, there are significant gaps in research exploring how these constructs operate (or relate to one another) in the schizotypal population. Given this limitation, the current study sought to explore the relationship of these variables in high risk individuals. The following *a priori* hypotheses were based on the existing literature: We anticipated that (1) individuals with higher levels of schizotypy would be more likely to have an external LOC as compared to those with lower levels of schizotypy, and (2) that lower levels of

QOL would be associated with greater external LOC. Finally, (3) SOC was predicted to act as a buffer against the deleterious effects of external LOC on quality of life.

The general relationships between each study variable were examined using bivariate correlations (hypothesis 1 & 2). Group differences in QOL, LOC, SOC, and stress, were examined by creating schizotypy groups based on symptom severity (e.g., high, med, low) and conducting an ANOVA while controlling for multiple comparisons (hypothesis 1). Finally, multiple linear regressions were used to examine (a) whether levels of LOC predict QOL, and (b) whether SOC interacts with LOC (moderates) in the prediction of QOL across all participants (hypothesis 3). Since levels of stress and symptom severity are also expected to relate to QOL, LOC, and SOC and, ratings of stress and levels of schizotypy I were entered as control variables within the regression model.

Chapter 2

Method

Participants

Participants used for this study were undergraduate psychology students recruited through the SONA system. Individuals were approached about potential study participation via email based on a prescreen assessment designed to measure levels of schizotypy these participants received class credit for their participation. We estimated that we would need to recruit at least 252 participants. Our final sample contained a total of 200 participants (106 male, 94 female) with 22 participants identified as having high schizotypy. Participants who did not complete the questionnaires of interest were not included in the analysis. A total of 68 participants were excluded from the sample analysis on the basis of endorsing one or more of the following criteria; incomplete data (n= 8) or endorsing 4 or more items on the validity measure (n= 46) .Validity questions were included on the prescreen and main assessments to account for random responding. Examples of validity questions can be viewed in Appendix E. Other exclusionary criteria included participants indicating no current, or past (month/year) stress (n= 11) or not identifying and areas of importance on the QOLI (n= 3).The mean age of our final sample was approximately 20 (M= 19.82/SD= 1.95) with a range of 17 to 31. The sample was predominantly Caucasian (74%). No participants were excluded on the bases of race, gender, or age. See Table 1 for additional details on the demographic composition of the final sample.

Materials and Procedure

This study aimed to assess individuals on the basis of schizotypy, locus of control (LOC), stress, quality of life (QOL) and sense of coherence (SOC). The study was conducted online via Survey Monkey, and was offered to participants who signed up through Rowan University's SONA system. Participants were recruited on the basis of their scores on the SPQ-BR, which were given as part of a pre-screen when the students registered on SONA. Prior to beginning the survey participants were required to read a document (online) that provided information about the nature of the study. In order to complete the survey, students had to indicate that they understood the voluntary nature of the project, the benefits and risks, and then provide their consent for participating in the study. Lastly, participants that completed the full sequence of questionnaires received credit for their introductory psychology course for their participation.

Schizotypal Personality Questionnaire- Brief Revised This study used the SPQ-BR (Cohen, Matthews, Najolia, & Brown, 2010) to determine the level of risk an individual could have schizotypal personality disorder or is characteristically “high-risk” to later develop schizophrenia (Jolley, Jones, & Hemsley, 1999). This study used the brief-revised version which was developed to address some of the psychometric shortcomings (e.g., internal consistency issues; inter-correlations of schizotypy domains) in previous versions (Cohen et al., 2010).

The SPQ-BR is a 32-item questionnaire comprised of a 3-factor super ordinate system which includes three domains: the Interpersonal domain, Cognitive-perceptual domain, and Disorganized domain. These domains are similar to the “negative”,

“positive” and “disorganized” symptom domains in schizophrenia (respectively), but represent a milder manifestation of these phenomena. These three domains can be further broken down into 7 subscales. These domains, the subscales and their internal consistency include; Interpersonal: no close friends/constricted affect (.75) and social anxiety (.71), Cognitive Perceptual: Ideas of reference/suspiciousness (.86), Magical Thinking (.55), and Unusual perceptions, and Disorganized: Eccentric behavior (.61) and Odd Speech (.79). Internal consistency for the overall questionnaire was reported at .90 (Cohen et al., 2010). High scores reflected in each of the domains were used to indicate high levels of the schizotypy trait. Scores were divided into three categories across each super-ordinate domain; high (above 90th percentile), moderate (mean – 90th percentile) and low (below mean).

Stress Analogue Scale (SAS). To measure present and previous stress levels participants were asked to rate their stress on a scaled from 0-100 (i.e., not at all to extremely) related to their subjective experience of stress over the last month, year, and currently. This scale has been effectively used to measure stress in previous research (e.g., Dinzeo, Cohen, Nienow & Docherty, 2004). This measure has been cited to be potentially more accurate than other stress scales in measuring the stress response, as it captures an individual’s subjective experience of stress as compared to measures that focus on specific stressors, assigning arbitrary values for specific experiences such as the Holmes and Rahe Stress Scale (Holmes & Rahe, 1967). This measure was primarily used as a control variable for the study. Low levels of stress may account for non-significant findings among the relationships between the variables of interest. Participants who indicated that they did not experience any stress (i.e., 0 on the scale) across all three

domains (moment, month, and year) were removed from analysis. Without stress, it would be difficult to interpret individual QOL scores since stress levels have shown to be strongly related to QOL (Bhandari 2012), LOC (Bollini, Walker, Hamann, & Kestler, 2004), and in the schizophrenia spectrum conditions (Walker & Diforio 1997).

Locus of Control (LOC). To measure locus of control, this study used Rotter's Locus of Control Scale. Items on this scale address an individual's beliefs about their world and their expectations about event outcomes and their controllability. The scale consists of 29 items; each item presents two opposing statements to represent tendencies or characteristics of the individual. Each statement represents either an internal or external LOC. Scores indicate whether an individual has a greater internal or external LOC. The scale shows stable internal consistency, ranging from .65 to .79 and satisfactory test-retest reliability at .49 to .83 (Rotter, 1966). Scores for this measure will be used as a continuous variable to measure individuals on the basis of greater internal (lower score) or external control (higher score). A greater external LOC is hypothesized to indicate lower QOL scores and greater stress scores, particularly in those with higher schizotypy levels across domains.

Sense of Coherence (SOC). An individual's sense of coherence represents the degree to which they feel capable of managing stressful stimuli and remain healthy. To measure this construct this study used Antonovsky's Sense of Coherence Scale (Eklund & Backstrom, 2006; Landsverk & Kane, 1998). This scale breaks down the construct of coherence into three subscales; comprehensibility, manageability, and meaningfulness (Landsverk & Kane, 1998). This scale consists of 29 Likert-scale questions with overall scores ranging from 29-203. Tests on the validity of the scale report that an individual's

SOC is significantly (negatively) related to life stress and psychological distress consistent with Antonovsky's hypothesis that coherence is related to an individual's success in coping with stress and establishing a sense of well-being (Flannery, Perry, Penk, & Flannery, 1994). SOC scores will be used to measure the potential buffering effects of SOC on LOC and QOL. Higher SOC scores are theorized to help buffer against the deleterious effects of an external LOC. This would mean that despite having a greater level of external LOC, higher SOC levels may indicate greater QOL scores. Scores were viewed as a continuous range of the SOC trait.

Quality of Life Inventory (QOLI). To measure quality of life, this study used a 32-item inventory requiring individuals to rate 16 domains on the basis of importance and satisfaction (Frisch, 1994). The 16 domains include: Health, Self-Esteem, Goals-and-Values, Money, Work, Play, Learning, Creativity, Helping, Love, Friends, Children, relatives, Home, Neighborhood, and Community. *Importance* is rated on a scale of 0-2 from not important to extremely important. *Satisfaction* is rated on a scale of -3 to +3, from not very satisfied to very satisfied. These scores are combined and create index scores where higher scores indicate greater QOL levels. The *QOLI domains* have demonstrated good internal consistency (coefficient alpha = .79) and stability across a two-week period (test-retest coefficient = .73). Domain scores of this questionnaire will be combined to create overall ratings of QOL (global QOL) and used to compare to other variables within this study. Score interpretation reveals four standard classifications for this test including High (3.6-6.0 raw score), Average (1.6-3.5 raw score), Low (.9-1.5 raw score), and Very low (-6.0-.8 raw score) (Frisch, 1994). For the purpose of this study scores were interpreted as a continuous measure.

Chapter 3

Results

Descriptive analyses were conducted on sample demographics, sense of coherence, quality of life, schizotypy, and locus of control. Demographic analyses were first conducted to examine the sample and variable characteristics, and distribution (table 1). Out of an overall sample of 200 participants (106 male, 94 female), no significant differences were found on the basis of ethnicity, age, or gender when comparing across variables. Using a One-Way ANOVA to examine group differences in gender and ethnicity no significant differences across each in regard to schizotypy levels or among the target variables (table 6). Further analysis showed no significant findings among the other variables. Results showed the sample had a greater percentage of Caucasians (75%), consistent with the University's student population. Scores from each measure were normally distributed, with no excessive skew or kurtosis. Schizotypy scores were divided into three groups, low, moderate and high for portions of our analyses (e.g., group comparison using ANOVA) but remained continuous when possible (e.g., certain bivariate correlation analyses). This study identified 22 individuals in the high-risk group, 78 in the moderate risk, and 100 in the low risk. All other variables remained continuous. Descriptive data for each of the measures can be viewed in Table 2.

Pearson's bivariate correlations were used to examine the relationships between scores for each of the main variables included in the study. Table 3 depicts the correlations for the full sample). Results for the full sample showed that LOC was significantly positively correlated to the SPQ($r=.182$); a greater external locus of control

is associated with higher levels of schizotypy (hypothesis 1). QOL was not significantly correlated to LOC, ($r = -.108$) (hypothesis 2). In addition, other relationships were largely consistent with previous research. LOC was negatively correlated to SOC, indicating a greater external locus of control is significantly correlated to a lower SOC, ($r = -.417$). QOL was negatively correlated to levels SPQ and stress. As expected, stress had a significant relationship with each variable.

Additional correlational analyses were completed to examine the relationships of the key variables between the high and low groups (Table 4). The majority of significant correlations were lost among the high risk group, with the exception of the relationship between schizotypy level and sense of coherence, where the high risk group had a stronger negative relationship ($r = -.576^{**}$) than to the low risk group ($r = -.354^{**}$). These findings speak to the potential strength of the relationships between SOC and SPQ, as it maintained its strength despite a loss of power. Furthermore, despite non-significance, the high risk group also showed stronger relationships between stress and quality of life ($r = -.381$) as well as stress and schizotypy level ($r = .398$) as compared to the low group ($r = -.187$) and ($r = .297$). Though a significant loss of power may account for the non-significant relationships within the high-risk group, these findings speak to the strength of these variables as they relate to schizotypy.

A One-Way ANOVA was conducted to further assess the relationship between schizotypy and the variables of interest. Results indicated that LOC was significantly different between schizotypy groups (hypothesis 1: $F(2,198) = 4.1$, $p = .018$). Those in the high risk group ($M = 14.6$, $SD = 3.17$) were significantly greater in external LOC than those in the moderate ($M = 13.0$, $SD = 2.9$) and low ($M = 12.6$, $SD = 2.9$) groups. Significant

differences were also found for both SOC ($F(2,198) = 24.6, p = .000$) (Figure 2) and Stress ($F(2,198) = 6.7, p = .001$) across schizotypy groups, supporting the relationships indicated in the bivariate correlation analyses. Results showed that mean levels of stress were significantly elevated in the high risk group in comparison to the moderate and low groups. Further data on the results of the ANOVA are reported in Table 5. Unexpectedly, levels of QOL were only marginally different across schizotypy groups ($F(2,198) = 2.7, p = .070$) despite significant correlational findings ($r = -.221, p = .002$). A visual representation of the variable x schizotypy interactions can be viewed in figure 1.

The final hypothesis (3) predicted that SOC would moderate the relationship of LOC and QOL. Results indicated that while stress significantly predicted QOL levels while accounting for a significant portion of its variance. However, contrary to our hypothesis, only a marginally significant change occurred when including SOC and LOC. Similarly, no significant change occurred in the final block containing the interaction term of SOC and LOC, thus there was no evidence of moderation. Data for the Linear Hierarchical Regression Analysis can be seen in Table 5.

Chapter 4

Discussion

This study explored the nature of variables known to impact an individual's quality of life and contribute to the prognosis and recovery of an individual diagnosed with schizophrenia. Specifically, this study examined whether high levels of schizotypy would be associated with greater external locus of control (hypothesis 1) and the degree to which QOL was associated with external LOC (hypothesis 2). In addition, the study examined whether SOC would moderate the relationship between external LOC and QOL (hypothesis 3).

Correlational analyses largely supported the first hypothesis; high levels of schizotypy were associated with a greater external LOC (hypothesis 1). This relationship was further tested with an ANOVA which also supported the idea high levels of schizotypy would be related to a greater external LOC as compared to the moderate and low schizotypy groups. While these findings are consistent with the schizophrenia literature (Haley, 2003; Roddenberry & Renk, 2010), the current study is the first to document this relationship among high-risk individuals. While we cannot make statements regarding causality (or directionality) between external LOC and levels of schizotypy, the general relationship suggests that there may be some clinical benefits to interventions that include a LOC component. For example, an external LOC is associated with a reduction in help-seeking behaviors which may significantly impact an individual's treatment outcome, relapse rate, and quality of life (Ascher-Svanum, Zhu, Faries, et al. 2010). Research targeting chronically ill populations such as Parkinson's

Disease (Zamperieri, Abib & de Sousa, 2011), schizophrenia and other psychotic disorders (Eklund & Backstrom, 2006), as well as seizure disorders (Strutt, Hill, Scott, Uber-Zak & Fogel, 2011) support the notion that interventions designed to increase an individual's internal LOC may and strengthen an individual's sense of empowerment, quality of life, and overall prognosis. Prevention based interventions may include psycho-education or exposure therapy (Zamieri et al., 2011). Thus, increasing internal LOC in individuals with high levels of schizotypy may provide an additional protective factor for improving stress management and increasing overall quality of life (Zampieri, Abib et al., 2011). Greater external locus of control was associated with higher stress levels. Research has shown that both external LOC and stress are associated (separately) with a lower quality of life. The association of external LOC with greater stress levels in the present study provides some support for the notion that developing an internal LOC orientation may help reduce stress-related phenomenon and improve treatment adherence.

Unexpectedly, this study was not able to demonstrate a direct association between LOC and QOL (Hypothesis 2). However, lower QOL and external LOC scores were strongly associated with both higher SPQ scores and greater stress levels. Even without evidence for a direct link between LOC and QOL, interventions targeted to address LOC orientation among high risk individuals may be beneficial in increasing an individual's perception of control over stressful events, as well as reducing their overall stress response. Additional research (in older adults) has suggested that cognitive training, focused on enhancing reasoning and processing speed, enhances an individual's sense of personal control (Wolinsky, Wander Weg, Martin, & Unverzagt et al., 2009). Furthermore, SPQ scores were associated with lower QOL and greater stress scores.

These findings are consistent with previous research in the psychosis-spectrum conditions regarding a greater stress-sensitivity. Research on the negative impact of stress on QOL levels (Ritsner et al., 2003) and its contributions to the onset of schizophrenia (Gleeson, 2006; Ritsner et al., 2003; Walker & Diforio, 1997) indicate that it may be beneficial to address the issue of stress appraisal and manageability among the high-risk population. Though the results for hypothesis 2 were unanticipated, there are several (3) possible explanations to provide insight to these findings.

First (1), the relationship between LOC and QOL may be more complex than generally assumed in the literature. Several previous studies report inconsistent data with the notion that there is a simple linear relationship between LOC and stress, which may have important implications regarding the ultimate relationship between LOC and QOL. For example, a study by Bollini and colleagues (2003) found that an individual's stress response was based on the congruency of their LOC orientation and their ability to control the stressful stimuli that they face. In this study there was a tendency for individuals with an internal LOC that were confronted with stressful stimuli not in their control to have a greater stress response (cortisol secretion) than someone with an external locus of control. Therefore, there is a possibility that there is an important LOC x Situation interaction that must be taken into account when attempting to understand a complex phenomenon such as QOL.

Second (2), this study examined LOC as a continuous variable. Several studies have used internal and external LOC as separate variables (Haley, Drake Bentall and Lewis, 2008; O'Leary, 1977), indicating that orientation-type may be based on the stress-type experienced. Separating these variables in future research may help provide further

explanation as to how having a greater external LOC (given a specific stimulus) has a negative effect on QOL levels.

Finally (3), there is a possibility that LOC may be “indirectly” related to QOL (vs. directly related as we predicted). For example, within the clinical population, an external LOC is related to poorer treatment response and adherence (Haley et al., 2008), symptom relapse (Gleeson, 2006), and greater levels of subjective stress (Bollini et al, 2003). Therefore, while LOC may be related to these phenomena, the combined impact of these other experiences may be more directly related to an individual’s quality of life (Ascher-Svanum, et al., 2010; Ruhrmann et al., 2008; Zampieri & de Souza, 2011). The findings of the current study, although unanticipated, may provide a context to better understand the relationship between LOC and overall QOL appraisal. However, additional research is needed to further explore these alternative explanations for the results of the second hypothesis.

While this study was able to support a strong relationship between schizotypy and QOL, this association became weaker when examining group comparisons. Several factors may explain this discrepancy. First, when creating sub-groups of the sample, a loss of power may have occurred that was significant enough to affect the strength of the association. Group sizes were also uneven which may have further limited this study’s ability to assess group differences. Second, sample limitations may have affected the ultimate findings of the study (e.g., restricted demographic range (see Table 1). Finally, schizotypy as a construct is considered to be sub-clinical. Thus, it may be difficult to generalize the QOL levels obtained in this study to schizotypy populations found in the general community as well as to the schizophrenia population.

This study failed to show a significant moderation effect of SOC on the relationship between LOC and QOL (hypothesis 3). The lack of relationship between LOC and QOL acts as a significant obstacle to the moderation model as SOC would not have any relationship to moderate. Furthermore, the regression model assumed that QOL levels were predicted by LOC orientation, Stress, and SPQ scores. The model assumes that the main independent variable under consideration (LOC) would act as predictor to the dependent variable (QOL). As previously discussed, we did not find evidence for a direct association between LOC and QOL. Rather, we found only indirect evidence that LOC was related to stress appraisal (and perhaps its neurological and physiological effects, as reported in Bollini et al., 2003). While SOC was initially included as a potential moderating variable (an individual's ability to manage, comprehend, and adapt to their stressors) for the relationship between LOC and QOL, the regression analysis suggested that SOC was predictive of QOL (Table 6). Given the lack of relationships between LOC and QOL, a moderating effect unlikely. These findings support the notion that SOC may play a stronger role in stress management, as it affects QOL levels, than LOC. SOC displayed the strongest relationship with several variables, including stress ($r = .451^{**}$), LOC ($r = -.417^{**}$) and SPQ ($r = -.499^{**}$). It also displayed a stronger relationship with QOL than any other target variable ($r = .289^{**}$). These relationships support the notion that SOC may be a stronger variable as a measure of stress management, and its consequent effects on QOL.

Furthermore, stronger relationships were present between SOC and other variables of interest when compared to LOC (Table 3). Considering our findings related to SOC, it appears that SOC may be a fruitful construct to focus on in future research.

While research involving LOC is more prevalent, the findings from this study suggest that SOC may (in fact) be more relevant in combating negative effects of stress and their concurrent effects on overall QOL. The initial goal of the third hypothesis was to establish SOC as a buffer against the negative effects of an external LOC. While this study was not able to successfully support this hypothesis, it appears that greater SOC levels may act as a strong predictor of QOL over stress and schizotypy-risk. Its association with a greater internal LOC supports previous research regarding the effects of self-efficacy and greater proactive behaviors in coping with stressful stimuli (e.g. treatment).

Considering the mixed data regarding LOC orientation on the stress response, SOC appears to be the stronger variable in stress-appraisal and its concurrent effect on QOL levels. Targeting SOC levels among individuals would involve increase their ability to understand and process and unpredictable event (comprehensibility), utilize available resources (manageability) and prioritize its level of emotional importance (meaningfulness), as an individual is faced with a stressful stimulus (Antonovsky, 1984). Improving these components, which define the construct of SOC, may enhance the individual's ability to cope with stress as well as lessen its negative effect on their overall QOL (Sullivan, 1993). Overall, these findings suggest that the greater ability an individual has to manage, comprehend, and associate meaning to stressful events the more they should be able to reduce the overall negative effects of stress. Future research is needed to specifically determine if interventions that lead to improvements in SOC also improve QOL under real-life circumstances.

As mentioned in the Introduction, stress may play a role in the etiology of some psychotic disorders. Therefore, early preventative interventions targeting LOC, SOC, and stress may still be beneficial for those at risk for schizophrenia. It may be possible that the greater sensitivity to stress is being compounded by poor stress appraisal (SOC and perhaps indirectly via LOC), leading to decrements in QOL. Though research on treatment approaches is limited, some interventions have been noted to aid in the enhancement of SOC and LOC. Literature targeting SOC has suggested implementing service models which promote autonomy and self-reliance. Furthermore these models would encourage the use of informal support networks and increase user-friendly access to health information and resources (Forbes, 2001). Targeting the appraisal and attribution process may help to lessen the burden of stressful experiences. As demonstrated in the regression analyses, SOC, in particular, may play a stronger role in connecting the experience of stress to QOL levels.

QOL was the main DV, and central focus, of this study and has been directly linked to symptom severity, treatment outcome and prognosis among the schizophrenia population (Bhandari 2012; Cotton, Gleeson, Alvarez-Jimenez, & McGorry, 2010; Ritsner, Kurs, Ponizovsky, & Hadjez, 2004). Further exploration into the relationship between QOL and symptom severity have shown greater complexity regarding the significance of subjective and objectively defined QOL. Studies examining the relationship between subjective and objective QOL among high-risk populations have shown differences across sub-domains. Specifically, Cohen and Davis (2009) demonstrated that symptom severity level was negatively associated with QOL levels (consisted with this study), though the association was stronger on subjective measures of

QOL and in those with more severe negative (interpersonal) schizotypy symptoms. Further research has also shown a greater disparity in subjective QOL scores among negative symptoms of schizophrenia (Narvaez, Twamley, McKibbin, Heaton, & Patterson, 2008). Results of this study showed that sub-domains of the SPQ (interpersonal, cognitive-perceptual, and disorganized) relatively consistently had strong relationships among each of the other variables (QOL, LOC, stress, and SOC) (Table 3). When examining sub-domain scores among these associations, associations among the interpersonal domain had consistently stronger associations to each variable (SOC, LOC, stress, and QOL). Consistent with previous literature, implications of these findings may direct treatment approaches to target interpersonal symptoms and characteristics. Preventative interventions among the schizotypy population may include social skills training, as well as treatments targeted to enhance self-esteem and confidence (Cohen & Davis, 2009). Noted interventions targeted specifically at addressing negative symptoms of schizophrenia include cognitive behavioral therapy, supported employment, social skills training, assertive community treatment, and cognitive training (Narvaez et al., 2008).

Future research is needed to better clarify role of LOC orientation and its relationship to QOL levels within the high-risk population. In addition, SOC could be explored further for its strength in potentially moderating the negative effects of stress on QOL levels, rather than LOC. Furthermore, a more in-depth assessment of stress experiences and their perceived control could be assessed to expand upon the discussion of the congruency between LOC orientation and stress. For example, the current study did not assess an individual's specific experience with stressors and the degree of control

available, or how they may have had an impact on the individual's quality of life. Longitudinal research within the schizophrenia population could explore these relationships to better understand the development and complex nature of an individual's stress attribution style (LOC and SOC), and stress reactions in those with a heightened risk for schizophrenia. This form of research might also help to account for other "third variables" such as comorbid psychological issues as they relate to QOL and stress response.

There are several limitations to this study which may have had an impact on its current findings. This study used data collected online via self-report of all university-aged students. These restrictions make it difficult for this study's findings to be generalized to the general population of high-risk individuals given the restricted age ($M = 20$, $SD = 1.95$) and ethnicity (74% Caucasian). In addition, there were an uneven number of participants among schizotypy groups (Table 2), which may have limited our ability to effectively identify true differences in our between-group comparisons. Furthermore, this study did not attempt to examine the nature of the stress experienced by the participants, in that the congruency between the stressful stimuli and its ability to be managed by the individual and their LOC orientation and SOC level. Examining this relationship may provide further insight into the complex nature of LOC and how it plays a role in QOL levels and schizotypy risk.

Overall this study was able to confirm that a greater external LOC is associated with a greater level of schizotypy (hypothesis 1). These findings are consistent with past research within the population of schizophrenia. Despite the lack of significant findings for the second and third hypotheses, several significant relationships were found that

support prior research in the schizophrenia population. These findings suggest that individuals considered “high-risk” for schizophrenia may share some interpersonal attributes of the greater schizophrenia population (i.e., increased stress, external LOC and poorer QOL). This study also documented strong relationships between SOC, levels of schizotypy, stress, and QOL. This suggests that additional research examining the role of SOC is certainly warranted. These results, while tentative, are consistent with suggestions that preventative interventions specifically targeted at increasing an individual’s ability to cope with stress (particularly SOC per our study) may have positive clinical effects for those at risk for schizophrenia (Griffiths, 2005). These preventative interventions may provide support later on, allowing for a greater treatment outcome and prognosis (Gleeson, 2006), as well as enhancing an individual’s proactive approach to their treatment (Haley et al., 2008). Both of these factors have shown to be beneficial for the client’s QOL, as well as potentially reducing the overall cost and burden of the national health care budget (Ascher-Svanum, 2010).

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Appendix A: Figures

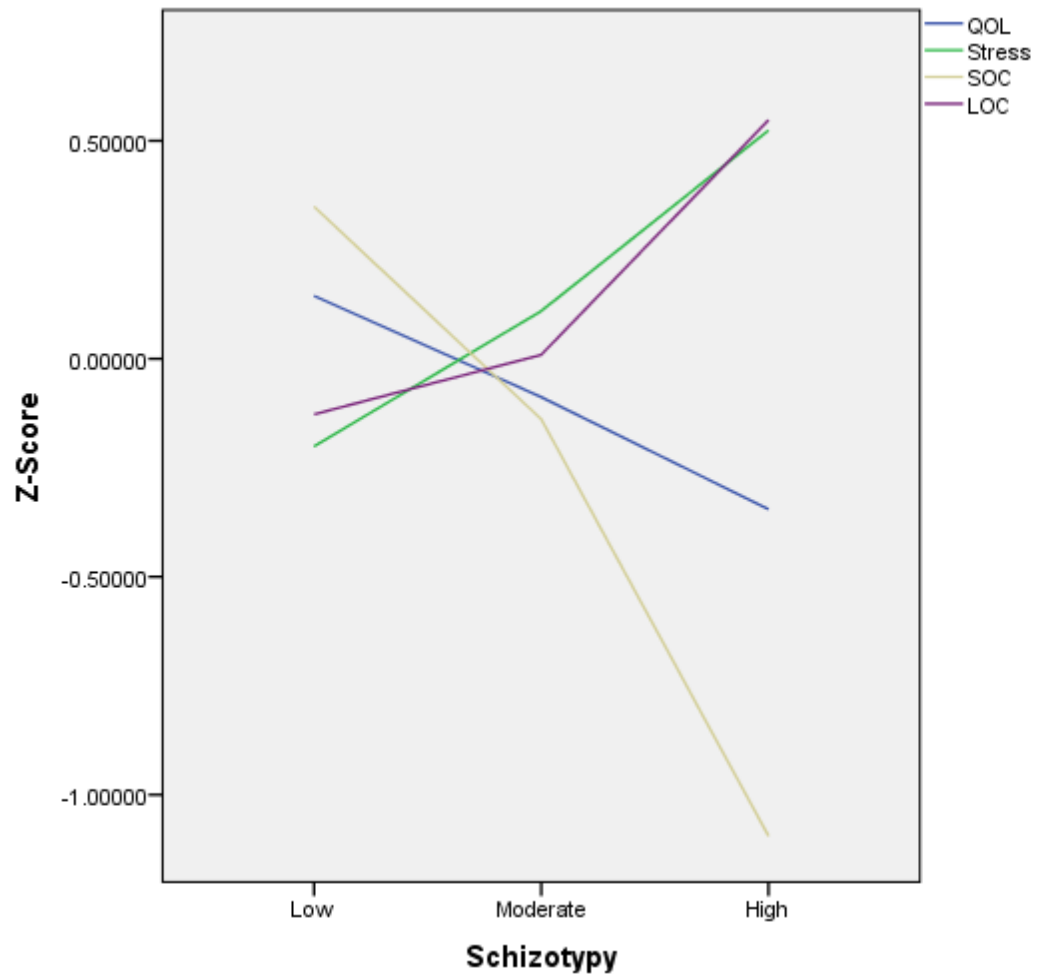


Figure 1: Z Score comparisons of target variables by Schizotypy risk group.

Appendix B: Tables

Table 1: Demographics of sample by risk group and total scores.

Demographic	Schizotypy Group							
	Low Risk		Moderate Risk		High Risk		All	
	N	%	N	%	N	%	N	%
Gender								
Male	51	51.0	44	56.4	11	50.0	106	53.0
Female	49	49.0	34	43.6	11	50.0	94	47.0
Ethnicity								
Caucasian	74	74.0	58	74.4	16	72.7	148	74.0
African American	7	7.0	8	10.3	4	18.2	19	9.5
Asian-Pacific Islander	4	4.0	2	2.6.0	0	0	6	3.0
Native American	0	0	0	0	0	0	0	0
Hispanic	11	11.0	7	9.0	2	9.1	20	10.0
Other	4	4.0	3	3.8	0	0	7	3.5
Age								
<20	54	54.0	31	52.4	16	72.8	110	76.0
20-29	46	46.0	36	46.3	6	27.2	89	44.5
>30	0	0	1	1.3	0	0	1	.5

Table 2: Descriptive, ANOVA, and Post Hoc results of target variables and schizotypy risk sub-groups.

Measure	Schizotypy Groups											
	Low Risk N=100		Moderate Risk N=78		High Risk N=22		All N=200		F	p	Sig. Group Diff.	α
	X	SD	X	SD	X	SD	X	SD				
SPQ total	2.06	.34	2.89	.21	3.36	.37	2.53	.57	248.	.00	3>2,1, 2>1	.907
IP	2.08	.52	2.93	.53	3.33	.68	2.55	.72	78.3	.00	3>2,1, 2>1	.831
CP	1.87	.41	2.67	.47	3.14	.47	2.32	.64	111.	.00	3>2,1, 2>1	.846
D	2.37	.34	3.24	.50	3.76	.62	2.86	.78	73.6	.00	3>2,1, 2>1	.854
QOL	7.37	1.03	7.14	.99	6.68	.77	7.23	1.00	2.70	.07	No sig.	.878
SOC	129.	16.7	121	15.2	104.7	11	123	17.45	24.8	.00	3>2,1, 2>1	.840
LOC	12.6	3.17	13.0	2.98	14.72	3.0	13.0	3.13	4.25	.01	3>2,1	.466
Stress	42.8	20.4	49.2	19.8	57.72	19.	46.9	20.57	5.76	.00	3>1	.795

Table 3: Bivariate Correlations of target variables and total scores for full sample (n=200).

	Stress	QOL	LOC	SOC	SPQ	IP	D	CP
Stress	_____							
QOL	-.234**	_____						
LOC	.224**	-.108	_____					
SOC	-.451**	.289**	-.417**	_____				
SPQ	.340**	-.227**	.223**	-.499**	_____			
IP	.330*	-.214**	.193	-.449**	.794**	_____		
D	.212*	-.116	.215**	-.404**	.788**	.508**	_____	
CP	.276*	-.208**	.149*	-.371**	.844**	.456**	.498**	_____

Note: Sub-domains of SPQ include Interpersonal (IP), Disorganized (D), and Cognitive Perceptual (CP).

** p < 0.01 level.

* p < 0.05 level.

Table 4: Bivariate Correlations of target variables between high and low risk groups.

	Stress	QOL	LOC	SOC	SPQ	IP	D	CP
Stress	_____	-.187	.258**	-.409**	.297**	.277**	.091	.204*
QOL	-.381	_____	-.177	.318**	-.207**	-.123	-.064	.723**
LOC	.044	-.034	_____	-.423**	.174	.044	.096	.209*
SOC	-.151	.180	-.258	_____	-.354**	-.245*	-.260**	-.225*
SPQ	.398	-.190	.273	-.576**	_____	.679**	.637**	.723**
IP	.386	-.330	.345	-.440*	.757**	_____	.182	.277**
D	.155	.095	.420	-.317	.748**	.627**	_____	.159
CP	.204	-.074	-.179	-.343	.456*	-.138	-.053	_____

Note: Items in the upper right represent correlations found in the low risk group (N=100), data in the bottom left represent scores in the high risk group (N=22).

** p < 0.01 level.

* p < 0.05 level.

Table 5: Moderation effects of Sense of Coherence on Locus of Control and Quality of life through Hierarchical Linear Regression.

Predictor	ΔR^2	β	95% CI
Step 1	.079**		
SPQ		-.292*	[.885, 1.130]
Stress		-.009*	[.885, 1.130]
Step 2	.024*		
LOC		.007	[.987, 1.01]
SOC		.011*	[-.028, .048]
Step 3	.000		
LOC*SOC		1.185E	[-.002, .002]

** p < 0.01 level. * p < 0.05 level.

Table 6: Group Differences in Ethnicity and Gender.

	Mean						F	Sig.
Ethnicity	White, Non-Hispanic (148)	African American (19)	Hispanic (20)	Asian-Pacific Islander (6)	Other (7)	Total		
QOL	7.18	7.43	7.44	6.59	7.72	7.23	1.56	.185
Stress	45.55	44.84	50.70	62.55	58.04	46.94	1.787	.133
SPQ	2.55	2.69	2.32	2.46	2.31	2.53	1.319	.264
SOC	123.44	120.00	128.80	130.33	124.00	123.88	.858	.491
LOC	12.14	12.57	12.95	13.00	11.57	13.01	.521	.721
Gender	Male	Female				Total		
QOL	7.20	7.26				7.23	.227	.634
Stress	44.30	49.92				46.94	3.76	.054
SPQ	2.51	2.55				2.53	.172	.679
SOC	124.43	123.25				123.88	.226	.635
LOC	13.00	13.01				13.01	.000	.998

Note: No significant findings were found for either gender or ethnicity across target variables.

Appendix C: Measures

Appendix C1: Sense of Coherence

The 13-item Sense of Coherence Questionnaire

Here is a series of questions relating to various aspects of your lives. Each question has seven possible answers. Please mark the number, which expresses your answer, with number 1 and 7 being the extreme answers. If the words under 1 are right for you, circle 1: if the words under 7 are right for you, circle 7. If you feel differently, circle the number which best expresses your feeling. Please give only one answer to each question.

1	Do you have the feeling that you don't really care about what goes on around you? 1 2 3 4 5 6 7 Very SeldomVery often
2	Has it happened in the past that you were surprised by the behavior of people whom you thought you knew well? 1 2 3 4 5 6 7 Never Happened.....Always Happens
3	Has it happened that people whom you counted on disappointed you? 1 2 3 4 5 6 7 Never Happened Always happens
4 R	Do you have the feeling that you don't really care about what goes on around you? (Me) 1 2 3 4 5 6 7 Very SeldomVery often
5 R	Has it happened in the past that you were surprised by the behavior of people whom you thought you knew well? (C) 1 2 3 4 5 6 7 Never Happened.....Always Happens
6 R	Has it happened that the people whom you counted on disappointed you? (Ma) 1 2 3 4 5 6 7 Never Happened.....Always Happens
7 R	Life is: (Me) 1 2 3 4 5 6 7 Full of Interest.....Completely Routine
8	Until now your life has had: (Me)

	1	2	3	4	5	6	7
	No clear goals Very clear goals						
	Or purpose at all purpose						and
9	Do you have the feeling that you're being treated unfairly? (Ma)						
	1	2	3	4	5	6	7
	Very often.....						Very seldom or never.
10	In the past ten years your life has been: (C)						
	1	2	3	4	5	6	7
	Full of changes.....						Completely consistent without your knowing what will happen next.
							and clear
11	Most of the things you do in the future will probably be: (Me)						
R	1	2	3	4	5	6	7
	Completely Fascinating.....						Deadly Boring
12	Do you have the feeling that you are in an unfamiliar situation and don't know what to do? (C)						
	1	2	3	4	5	6	7
	Very often.....						Very Seldom or Never
13	What best describes how you see life: (Ma)						
R	1	2	3	4	5	6	7
	One can always.....						There is no solution find a solution to things in life. painful things in life.
							and painful
14	When you think about your life, you very often: (Me)						
R	1	2	3	4	5	6	7
	Feel how good Ask yourself why it is to be alive. exist at all.						you
15	When you face a difficult problem, the choice of a solution is: (C)						
	1	2	3	4	5	6	7
	Always confusing.....						Always completely clear And hard to find.
16	Doing the things you do every day is: (Me)						
R	1	2	3	4	5	6	7
	A source of deep pain pleasure and satisfaction boredom						A source of and
17	Your life in the future will probably be: (C)						
	1	2	3	4	5	6	7

	Full of changes..... Completely without knowing what will happen next. consistent and clear.
18	When something unpleasant happened in the past your tendency was: (Ma) 1 2 3 4 5 6 7 “To eat yourself..... To say “ok that’s that, Up about it”. I have to live with it And go on.
19	Do you have very-mixed-up feelings an ideas? (C) 1 2 3 4 5 6 7 Very often Very seldom or never
20 R	When you do something that gives you a good feeling: (Ma) 1 2 3 4 5 6 7 It’s certain that..... It’s certain that something You’ll go on will happen to spoil the Feeling good. Feeling.
21	Does it happen that you have feelings inside you would rather not feel? (C) 1 2 3 4 5 6 7 Very often..... Very seldom or never
22	You anticipate that your personal life in the future will be: (Me) 1 2 3 4 5 6 7 Totally without Full of meaning or purpose and purpose
23 R	Do you think that there will always be people whom you’ll be able to count on in the future? (Ma) 1 2 3 4 5 6 7 You’re certain You doubt there will be
24	Does it happen that you have the feeling that you don’ t know exactly what’s about to happen? (C) 1 2 3 4 5 6 7 Very often..... Very seldom or never
25 R	Many people- even those with a strong character- sometimes feel like sad sacks (losers) in certain situations. How often have you felt this way in the past? (Ma) 1 2 3 4 5 6 7 Never..... Very often
26	When something happened, have you generally found that: (C) 1 2 3 4 5 6 7 You overestimated..... You saw

	things or underestimated it's proportion Importance.							in the right
27 R	When you think of the difficulties you are likely to face in important aspects of your life, do you have the feeling that: (Ma)	1	2	3	4	5	6	7
	You will always.....You won't succeed in overcoming overcoming the difficulties. the difficulties.							succeed in
28	How often do you have the feeling that there's little meaning in the things you do in your daily life? (Me)	1	2	3	4	5	6	7
	Very oftenVery seldom or never							
29	How often do you have feelings that you're not sure you can keep under control? (Ma)	1	2	3	4	5	6	7
	Very oftenVery seldom or never							

***Questions marked with an R are reversed scored. The labels C, Me, and Ma indicate the subscales comprehensibility (C), meaningfulness (Me), and manageability (Ma).*

Appendix C2: Locus of control

For each question select the statement that you agree with the most.

1	a. Children get into trouble because their parents punish them too much. b. The trouble with most children nowadays is that their parents are too easy with them.
2	a. Many of the unhappy things in people's lives are partly due to bad luck. b. People's misfortunes result from the mistakes they make.
3	a. One of the major reasons why we have wars is because people don't take enough interest in politics. b. There will always be wars, no matter how hard people try to prevent them.
4	a. In the long run people get the respect they deserve in this world. b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5	a. The idea that teachers are unfair to students is nonsense. b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
6	a. With the right breaks one cannot be an effective leader. b. Capable people who fail to become leaders have not taken advantage of their opportunities.
7	a. No matter how hard you try some people just don't like you. b. People who can't get other to like them don't understand how to get along with others.
8	a. Heredity plays the major role in determining one's personality. b. It is one's experiences in life which determine what they're like.
9	a. I have often found that what is going to happen will happen. b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
10	a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test. b. Many times exam questions tend to be so unrelated to course work that studying is really useless.
11	a. Becoming a success is a matter of hard work, luck has little or nothing to do with it. b. Getting a good job depends mainly of being in the right place at the right time.
12	a. The average citizen can have an influence in government decisions. b. This world is run by the few people in power, and there is not much the little guy can do about it.
13	a. When I make plans, I am almost certain that I can make them work. b. It is not always wise to plan to offer ahead because many things turn out to be a matter of good or bad fortune anyhow.
14	a. There are certain people who are just no good. b. There is some good in everybody.
15	a. In my case getting what I want has little or nothing to do with luck. b. Many times we might just as well decide what to do by flipping a coin.
16	a. Who gets to be the boss often depends on who was lucky enough to be in the right place first. b. Getting people to do the right thing depends upon ability. Luck has little or nothing to do with it.

17	<p>a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.</p> <p>b. By taking an active part in political and social affairs the people can control world events.</p>
18	<p>a. Most people don't realize the extent to which their lives are controlled by accidental happenings.</p> <p>b. There really is no such thing as "luck"</p>
19	<p>a. One should always be willing to admit mistakes.</p> <p>b. It is usually best to cover up one's mistakes.</p>
20	<p>a. It is hard to know whether or not a person really likes you.</p> <p>b. How many friends you have depends upon how nice a person you are.</p>
21	<p>a. In the long run the bad things that happen to us are balanced by the good ones.</p> <p>b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.</p>
22	<p>a. With enough effort we can wipe out political corruption.</p> <p>b. It is difficult for people to have much control over the things politicians do in office.</p>
23	<p>a. Sometimes I can't understand how teachers arrive at the grades they give.</p> <p>b. There is a direct connection between how hard I study and get the grades I get.</p>
24	<p>a. A good leader expects people to decide for themselves what they should do.</p> <p>b. A good leader makes it clear to everybody what their jobs are.</p>
25	<p>a. Many times I feel that I have little influence over the things that happen to me.</p> <p>b. It is impossible for me to believe that chance or luck plays an important role in my life.</p>
26	<p>a. People are lonely because they don't try to be friendly.</p> <p>b. There's not much use in trying too hard to please people, if they like you, they like you.</p>
27	<p>a. There is too much emphasis on athletics in high school.</p> <p>b. Team sports are an excellent way to build character.</p>
28	<p>a. What happens to me is my own doing.</p> <p>b. Sometimes I feel that I don't have enough control over the direction my life is taking.</p>
29	<p>a. Most of the time I can't understand why politicians behave the way they do.</p> <p>b. In the long run the people are responsible for bad government on a national as well as on a local level.</p>

Appendix C3: Schizotypal Personality Questionnaire-Brief Revised.

After reading each statement, please choose the response that is most representative of you.

Strongly Disagree (SD), Neutral (N), or Strongly Agree (SA)

Question	Response
1. I feel I have to be on my guard even with friends.	SD/N/SA
2. Have you found that it is best not to let other people know too much about you?	SD/N/SA
3. Do you feel that you are unable to get “close” to people?	SD/N/SA
4. Do you often have to keep an eye out to stop people from taking advantage of you?	SD/N/SA
5. I tend to keep my feelings to myself.	SD/N/SA
6. Do you often pick up hidden threats or put-downs from what people say or do?	SD/N/SA
7. Some people find me a bit vague and elusive during a conversation.	SD/N/SA
8. Some people think that I am a very bizarre person.	SD/N/SA
9. I am an odd unusual person.	SD/N/SA
10. People sometimes comment on my unusual mannerisms and habits.	SD/N/SA
11. I sometimes use words in unusual ways.	SD/N/SA
12. People sometimes find me aloof and distant.	SD/N/SA
13. I feel very uneasy talking to people I do not know well.	SD/N/SA
14. I feel very uncomfortable in social situations involving unfamiliar people.	SD/N/SA
15. I tend to keep in the background on social occasions.	SD/N/SA
16. I find it hard to communicate clearly what I want to say to people.	SD/N/SA
17. Have you ever noticed a common event or object that seemed to be a special sign for you?	SD/N/SA
18. Are you sometimes sure that other people can tell what you are thinking?	SD/N/SA
19. Have you ever had the sense that some person or force is around you, even though you cannot see anyone?	SD/N/SA
20. Do you ever suddenly feel distracted by distant sounds that you are not normally aware of?	SD/N/SA
21. What shopping do you get the feeling that other people are taking notice of you?	SD/N/SA
22. Have you had experiences with astrology, seeing the future, UFOs , ESP,	SD/N/SA

	or a sixth sense?	
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Appendix C4: Analogue Stress Scale

Please indicate the number that best represents your average level of stress within the past year (0 to

100), with 100 representing "extreme stress"

<u>1.</u>	At this very moment....	<u>1-100</u>
<u>2.</u>	Within the past month...	<u>1-100</u>
<u>3.</u>	Within the past year.....	<u>1-100</u>

Appendix C5: Quality of Life Inventory

Health: is being physically fit, not sick, and without pain or disability.	
1.	How important is HEALTH to your happiness? 0.....1.....2 Not important Important Extremely Important
2.	How satisfied are you with your HEALTH? -3.....-2.....-1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Self- Esteem: means liking and respecting yourself in light of your strengths and weaknesses, successes and failures, and ability to handle problems.	
3.	How important is SELF-ESTEEM to your happiness? 0.....1.....2 Not important Important Extremely Important
4.	How satisfied are you with your SELF-ESTEEM? -3.....-2.....-1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Goals and Values: are your beliefs about what matters most in life and how you should live, both now and in the future. This includes your goals in life, what you think is right or wrong, and the purpose or meaning of life as you see it.	
5.	How important is GOALS AND VALUES to your happiness? 0.....1.....2 Not important Important Extremely Important
6.	How satisfied are you with your SELF-ESTEEM? -3.....-2.....-1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Money: is made up of three things. It is the money you earn, the things you own (like a car or furniture), and believing that you will have the money and things that you need in the future.	
7.	How important is MONEY to your happiness? 0.....1.....2 Not important Important Extremely Important
8.	How satisfied are you with your MONEY? -3.....-2.....-1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Work: means your career or how you spend most of your time. You may work at a job, at home taking care of your family, or at school as a student. WORK includes your duties on the job, the money you earn (if any), and the people you work with. (If you are unemployed, retired, or can't work, you can still answer these questions).	
9.	How important is WORK to your happiness? 0.....1.....2 Not important Important Extremely Important
10.	How satisfied are you with your WORK?

	-3.....-2.....- 1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Play: is what you do in your free time to relax, have fun, or improve yourself. This could include watching movies, visiting friends, or pursuing a hobby like sports or gardening.	
11	How important is PLAY to your happiness? 0.....1.....2 Not important Important Extremely Important
12	How satisfied are you with your PLAY? -3.....-2.....- 1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Learning: means gaining new skills or information about things that interest you. LEARNING can come from reading books or taking classes on subjects like history, car repair, or using a computer.	
13	How important is LEARNING to your happiness? 0.....1.....2 Not important Important Extremely Important
14	How satisfied are you with your LEARNING? -3.....-2.....- 1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Creativity: is using your imagination to come up with new and clever ways to solve everyday problems or to pursue a hobby like painting, photography, or needlework. This can include decorating your home, playing the guitar, or finding a new way to solve a problem at work.	
15	How important is CREATIVITY to your happiness? 0.....1.....2 Not important Important Extremely Important
16	How satisfied are you with your CREATIVITY? -3.....-2.....- 1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Helping: means helping others in need or helping to make your community a better place to live. HELPING can be done on your own or in a group like a church, a neighborhood association, or a political party. HELPING can include doing volunteer work at a school or giving money to a good cause. HELPING means helping people who are not your friends or relatives.	
17	How important is HELPING to your happiness? 0.....1.....2 Not important Important Extremely Important
18	How satisfied are you with your HELPING? -3.....-2.....- 1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Love: is a very close romantic relationship with another person. LOVE usually includes sexual	

feelings and feeling loved, cared for, and understood. (If you do not have a LOVE relationship, you can still answer these questions).	
19	How important is LOVE to your happiness? 0.....1.....2 Not important Important Extremely Important
20	How satisfied are you with your LOVE? -3.....-2.....- 1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Friends: are people (not relatives) you know well and care about who have interests and opinions like yours. FRIENDS have fun together, talk about personal problems, and help each other out. (If you have no FRIENDS, you can still answer these questions.)	
21	How important is LOVE to your happiness? 0.....1.....2 Not important Important Extremely Important
22	How satisfied are you with your LOVE? -3.....-2.....- 1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Children: means how you get along with your child (or children). Think of how you get along as you care for, visit, or play with your child. (If you do not have CHILDREN , you can still answer these questions).	
23	How important CHILDREN to your happiness?(If you have no CHILDREN, say how important having a child is to your happiness.) 0.....1.....2 Not important Important Extremely Important
24	How satisfied are you with your CHILDREN? (If you have CHILDREN, say how satisfied you feel about not having children.) -3.....-2.....- 1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Relatives: means how you get along with your parents, grandparents, brothers, sisters, aunts, uncles and in-laws. Think about how you get along when you are doing things together like visiting, talking on the telephone, or helping each other out. (If you have no living RELATIVES, blacken the 0 ["Not Important"] circle for question 25 and do not answer question 26.)	
25	How important RELATIVES to your happiness 0.....1.....2 Not important Important Extremely Important
26	How satisfied are you with your RELATIVES? -3.....- 2.....- 1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Home: is where you live. It is your house or apartment and the yard around it. This about how nice it looks, how big it is and your rent or house payment.	

27	How important HOME to your happiness 0.....1.....2 Not important Important Extremely Important
28	How satisfied are you with your HOME -3.....-2.....- 1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Neighborhood: is the area around your home. Think about how nice it looks, the amount of crime in the area, and how well you like the people.	
29	How important is your NEIGHBORHOOD to your happiness 0.....1.....2 Not important Important Extremely Important
30	How satisfied are you with your NEIGHBORHOOD? -3.....-2.....- 1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very
Community: is the whole city, town or rural area where you live (it is not just your neighborhood). COMMUNITY includes how nice the area looks, the amount of crime , and how well you like the people. It also includes places to go for fun like parks concerts, sporting events, and restaurants. You may also consider the cost of things you need to buy, the availability of jobs, the government, schools taxes, and pollution.	
31	How important is your COMMUNITY to your happiness 0.....1.....2 Not important Important Extremely Important
32	How satisfied are you with your COMMUNITY? -3.....-2.....- 1.....0.....+1.....+2.....+3 Very Somewhat DISSATISFIED A little A little Somewhat SATISFIED Very

Appendix C6: Example Validity Questions

1. There have been times when I have dialed a telephone number only to find that the line was busy.	Yes	No
2. I find that I often walk with a limp, which is the result of a skydiving accident.	Yes	No
3. I believe that most light bulbs are power by electricity.	Yes	No
4. Sometimes when walking down the sidewalk, I have seen children playing.	Yes	No
5. I cannot remember a single occasion when I have ridden on a bus.	Yes	No
