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The effect of quality of life and health behaviors in schizotypy

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THE EFFECT OF QUALITY OF LIFE AND
HEALTH BEHAVIORS IN SCHIZOTYPY

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Abstract

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Individuals diagnosed with schizophrenia are typically found to engage in higher rates of poorer health behaviors, such as higher rates of smoking and poorer nutrition Along with poorer health behaviors, individuals with schizophrenia tend to report a lower quality of life than an individual without a schizophrenia diagnosis. Our study chose to look at schizotypy, or sub-clinical schizophrenia, and it's relation to quality of life and health behaviors. We found that individuals that measure high on the subclinical schizotypy scale tend to mirror the health and quality of life ratings of an individual diagnosed with schizophrenia – they are more likely to engage in poorer health behaviors (including higher rates of smoking) and to report a decreased quality of life than individuals who scored low on the schizotypy scale.

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Chapter 1

Introduction and Literature Review

Schizophrenia is a mental illness categorized in the DSM-TR-IV as a psychotic disorder characterized by reality distortion (e.g., hallucinations and delusions), disorganized thoughts and behaviors, and difficulty initiating adaptive behaviors (APA, 2000). While only .05% to 1.5% of the general population will go on to develop schizophrenia, as many as 10% of the population may experience sub-clinical manifestations that are believed to be related to schizophrenia (Meehl, 1990). The term schizotypy refers to the presence of the "sub-clinical" phenomenon and are often used to diagnose a personality disorder within the DSM-TR-IV Cluster A personality disorders. Cluster A personality disorders, which include Paranoid Personality Disorder, Schizoid Personality Disorder, and Schizotypal personality disorder, are characterized by symptoms such as suspiciousness of others, restricted range of expression, and social and interpersonal deficits. While the traditional medical model typically takes a categorical approach to mental illness, many professionals now believe that psychosis may actually be a continuous spectrum of symptoms/disorder (referred to as schizotypy) ranging from mild to severe. In this dimensional view of psychopathology researchers anticipate that the presence of "sub-clinical" schizotypy symptoms is distributed on a continuum in the population and that the presence of these symptoms also reflects an underlying risk for the development of the syndrome (e.g., schizophrenia). There is accumulating evidence that this may be a more valid way of conceptualizing psychosis (Johns & van Os, 2001; Rossler, Riecher-Rossler, Angst, et al., 2007).

Both schizophrenia and schizotypy are suggested to have three basic symptom clusters: positive symptoms, negative symptoms and disorganized symptoms (Vollema & Hoijtink, 2000; Vollema & van der Bosch, 1995). Positive symptoms in schizophrenia are defined as an excess or distortion of normal behavior or cognition (e.g., hallucinations and delusions). These can be manifested in several different ways, with auditory hallucinations being the most common type of hallucination reported (Rollins et al. 2010). In those with schizotypy, positive symptoms manifest themselves more subtly. For example, seeing something out of the corner of your eye that is not really there or hearing somebody call your name in an empty room. Negative symptoms in schizophrenia are defined as a static phenomenon characterized by the absence of emotive capabilities such as blunted affect, emotional withdraw, and lack of spontaneity and flow of conversation (Kay, Fiszbein, and Opler, 1987). The presence of these negative symptoms in individuals with schizophrenia is often associated with a poorer outcome in both Quality of Life (QOL) and overall social functioning (Hoffman, Kupper, and Kunz, 2000). In schizotypy, negative symptoms of schizophrenia may manifest themselves as having the inability to develop and maintain social relationships or struggling to connect with another person. Disorganized symptoms tend to present themselves in clinical symptoms such as a formal thought disorder and "bizarre" behavior and express themselves independently of the positive and negative schizophrenia symptoms (Bergman et all, 1996; BIlder et al., 1985). In schizotypy, disorganized symptoms may manifest as eccentric behavior or odd speech. For example, an individual experiencing disorganized symptoms may be hard to follow while speaking or may jump from one subject to the next.

When the symptoms of schizophrenia are identified and treated early, the research literature suggests that the long-term prognosis may be considerably better than if symptoms are allowed to persist. A meta-analysis of literature on duration of untreated psychosis has shown a negative correlation between the onset of psychosis (mostly negative symptoms) and receiving treatment and that intensive education campaigns raising awareness is an important and necessary part of early detection (Perkins et al., 2005; Foley et al., 2007; Joa et al., 2007). Early detection and intervention may help prevent "social, interpersonal, cognitive, and affective disruptions that accompany and follow a psychotic episode" (Tsuag, Stone, & Faraone, 2000). Examining levels of schizotypy may be one of the best predictors of developing schizophrenia; one study found that about 11% of individuals who endorsed schizotypal symptoms were diagnosed with schizophrenia within 39 months (Miller et al., 2002). While the causality of specific factors in why certain "high risk" individuals develop schizophrenia while some do not continues to be unclear, evidence has shown that the development and exacerbation of symptoms may be linked to environmental factors such as physical health. For example, one study found that the increased frequency of physical diseases such as cardiovascular disease and diabetes may be partly accounted for by the development of schizophrenia and its treatment (Leucht et al., 2007).

Problematic Lifestyle Behaviors in Schizophrenia and the Spectrum Disorders

People with schizophrenia tend to have greater health problems and unhealthier lifestyles when compared to the general population (Samele et al., 2007). These issues appear to contribute to the early mortality (Brown, 1997). On average, people with schizophrenia survive only 36.2 years after receiving their diagnosis of schizophrenia

(Capasso et al., 2008). While suicide and accidental deaths contribute to these high mortality rates for people with schizophrenia, there is also evidence that early mortality is also associated with poor health practices (Brown, Barraclough, & Inskip, 2000). In general, individuals with serious mental illnesses have been found to give less priority to their physical health when compared to a control group, with diagnosed individuals attributing control over their physical health to external factors such as powerful others and chance (Buhagiar et al., 2011).

One of the most problematic health behaviors for individuals with schizophrenia is nicotine use. It has been estimated that somewhere between 75% and 90% of individuals diagnosed with schizophrenia smoke compared to the 30% to 40% of smokers in the general population (Davis et al., 2002; Samele et al., 2007). Though the CDC warns that excess cigarette and tobacco use can cause cancer, heart disease, stroke, and lung diseases (including emphysema, bronchitis, and chronic airway obstruction), individuals diagnosed with schizophrenia are more likely to smoke cigarettes, are more likely to smoke cigarettes in excess, and have overall higher nicotine use than in the general population (Center for Disease Control and Prevention,2008; Campo-Arias et al., 2006; Kilian et al., 2006). The surprisingly-high rates of nicotine use in people with schizophrenia may be related to the temporary relief of negative symptoms associated with smoking. These symptoms may be a lack of motivation and interest or may be a short lived increase in memory, learning, attention, and thinking speed (Kumari & Postma, 2005). One post-mortem study found that mortality in smoking schizophrenia patients was related to tobacco related illnesses such as heart disease (29%), cancer (19%), and pulmonary disease (17%) (Goff et al., 2005). While much of the research

focuses on nicotine use in schizophrenia, some studies have also shown elevated nicotine use in individuals with schizotypy. Allan et al., 1995 have found a positive correlation between self-reported schizotypy and number of cigarettes smoked per day. Similarly, individuals with elevated nicotine use also tend to endorse higher levels of schizotypy (particularly disorganized symptoms); however, this was only found to be significant in individuals that had family members diagnosed with schizophrenia (Esterberg et al., 2007; 2009).

In addition, lack of exercise and poor nutritional health also continue to be a contributing factor to the health problems. Individuals with schizophrenia are more likely to have an elevated risk for cardiovascular disease and an increasingly elevated risk of obesity, diabetes, and hypertriglyceridemia (Goff et al., 2005). When compared to the general population, individuals with schizophrenia are also more likely to consume alcohol and caffeine daily, and to have higher daily consumption of salt and saturated fat (Bobes et al, 2010). Individuals diagnosed with schizophrenia also tend to have a higher BMI (body mass index), higher rates of unhealthy eating habits, higher likelihood to be diagnosed with type II diabetes, and reported engaging in less physical activity than the general population (Kilian et al., 2006; Lambert, Velakoulis, & Pantelis, 2003; Connoly & Kelly, 2005). As a result, the likelihood of developing cardiovascular disease is 12 times higher than the general population (Beebe, 2008). It is possible that these health issues begin prior to the development of psychosis (i.e., in those with schizotypy or who are in the early stage of illness) and may influence the development of schizophrenia. The health issues could create an additional "strain" on the individual that influences the development of early symptomology and could potentially decrease quality of life. The

experience of stress has been related to increased risk for the development of schizophrenia. This model, known as the diathesis-stress model, states that when both an individual's genetic predisposition and environmental stressors interact, the individual begins to express symptomology. While genetics may be highly relevant to the etiology of schizophrenia, not everyone with genetic predisposition will develop schizophrenia (Fowler, 1992). It is possible that if, with early recognition of genetic predispositions of schizophrenia, health care providers could target lifestyle/health issues and quality of life to decrease the likelihood of the expression of schizophrenia symptoms.

Issues related to "Quality of Life" in Schizophrenia and Spectrum Disorders

In the field of psychology, the term Quality of Life (QOL) is a multi-dimensional construct that involves an individual's subjective rating of happiness, life satisfaction, and subjective well-being. Researchers view ratings of QOL as an indicator for mental health and adjustment. The ratings of QOL allow researchers to obtain a more complete view of mental and physical health status beyond mere "symptom severity" while providing information that can inform the development of new treatments (Frisch, 1994).

Negative symptoms appear to be associated with the poorest QOL ratings overall. Individuals with prominent negative symptoms appear to be "less equipped to deal with the demands of their environment and, consequently, experience impoverished QOL" (Cohen & Davis, 2009). Typically, individuals who have more severe negative symptoms also have lower ratings of QOL, particularly in domains of social activity. Although further research is needed, it has been suggested that individuals with schizophrenia may feel hopeless about addressing issues that affect their QOL (Cohen & Davis, 2009). Likewise, individuals diagnosed with schizotypal personality disorder also tend to report

a lower level of subjective well-being. These ratings tend to be even lower than most other personality disorders (Cramer, Torgersen, & Kringlen, 2006). While deterioration of QOL may precede overt symptom formation, QOL does not appear to be determined by the severity of schizophrenia-spectrum symptoms alone (Melle et al., 2005). Recent research has shown that health problems are also related to decreased ratings of QOL in people with schizophrenia-spectrum conditions (Hausswolff-Juhlin et al., 2009). Health related QOL measures appear to mediate subjective ratings of general QOL, self-esteem, anxiety, and depression in individuals with schizophrenia (Meijer et al., 2008). Further research is needed to gain a more comprehensive picture of how co-occurring clinical symptoms and medical/health issues are related to QOL in this population. This is a potentially important area of research because health issues (and the reduced QOL associated with these issues) may be associated with increased risk for the development of schizophrenia in those with schizotypy. If research can demonstrate that health problems and poor QOL serve as early risk indicators, then it is possible that early interventions could be developed that address these issues and increase the likelihood of a better overall outcome.

The purpose of this study is to focus on two common areas of concern within psychotic disorders: Health/Lifestyle Behaviors and QOL. Based on the empirical literature we hypothesized that: (1) Individuals who score higher on schizotypy traits will endorse a poorer QOL and will have a higher rate of problematic health behaviors (including increased nicotine use, poorer nutrition, less physical activity, etc.) , and (2)that poor lifestyle/health behaviors will moderate the relationship between levels of schizotypy and QOL; Stated another way, individuals that have high levels of schizotypy

and poor lifestyle behaviors will have significantly poorer QOL than those with healthier lifestyles. We expect that this relationship will be significant in those with more prominent negative symptoms.

Instead of focusing on the clinical population of people diagnosed with schizophrenia we are proposing to examine these issues in college students with varying levels of schizotypy for a few different reasons: First, there appears to be a lack of research examining health/lifestyle issues in the schizotypy literature. This is unfortunate since these issues could influence levels of "risk" for transitioning to psychosis. Second, the examination of these issues in a "non-clinical" sample has the benefit of bypassing the confounding effects of anti-psychotic medication use that would be present in a clinical sample of patients (e.g., weight gain and health issues related to anti-psychotic medication use). Third, traditional college students are at an age (18-25) where the risk for the development of a psychotic disorder is the greatest. Thus, we believe that this form of research can expand our knowledge about the factors that contribute to "risk" for psychosis and may allow for the development of new interventions that include a focus on physical health / lifestyle and QOL issues.

Chapter 2

Method

Participants

Participants in this study were made up of 395 college age participants (M= 20.8) at a Northeastern University. Inclusionary criteria for this study specified that participants be eighteen years of age or older. The sample was 63.5% female and was 81.0% Caucasian. Please refer to Table 1 for additional information.

Table 1

Participant Characteristics

Characteristic	Distribution
Gender (%)	
Male	36.5
Female	63.5
Age	
M	20.8
SD	3.58
Range	18–48
Ethnicity (%)	
White/Caucasian	81.0
African American	8.4
Hispanic	6.6
Other	4.0

Procedures

This study was given IRB approval by the university and all participants consented to participate in this study. Participants in this study were recruited through

two different ways. One hundred and twenty four participants received credit for participating in the study through an undergraduate Essentials of Psychology course and were given assessments through paper-and-pencil questionnaires. The other 245 participants were recruited online via Rowan University and entered in a drawing to win a $40.00 gift certificate. Participants in the online assessment were recruited through online university newsletter. Students that were interested in completing the survey were given a link to our online questionnaire.

Measures

      Schizotypal personality questionnaire–brief revised (SPQ–BR). The SPQ–BR (Cohen et al., 2010) was used to measure the construct of schizotypy. This measure is composed of 32 statements, which include, "Other people see me as slightly eccentric (odd)." These statements are rated on a Likert-type scale with 1 (Not at all like me) to 5 (Very much like me). This measure has three subscales which include Interpersonal, Cognitive-Perceptual, and Disorganized. Scores were summed to obtain subscale and total scores, with higher scores indicating more schizotypy personality characteristics. Prior research found the SPQ–BR to have high internal consistency (Cronbach's α=.80-.90) .80 and .90 (Cohen, 2010). Please refer to Table 2 for alpha reliabilities for the SPQ–BR measure from the current sample.

      Lifestyle and habits questionnaire-brief (LHQ–B). The *LHQ–B* (Dinzeo, Sledjeski, & Thayasivam, 2013) was used to measure lifestyle health habits. This measure is composed of42 statements, such as "I am physically fit as most people my age", and "I eat five or more servings of fruits and vegetables daily" that are rated on a Likert-type scale with 1 (Strongly Disagree) to 5 (Strongly Agree). There are 8 separate

Table 2

Alpha Reliabilities Across Measures

Measure	Alpha Reliability
Schizotypal Personality Questionnaire (BR)	*A*
Cognitive Perceptual Distortions	.85
Interpersonal Deficits	.87
Disorganized Thoughts	.88
Quality of Life Inventory	*A*
Total Score	.78
Life and Health Behaviors Questionnaire	α
Health and Exercise	.91
Psychological Health	.77
Substance Use	.87
Nutrition	.77
Environmental Concern	.79
Social Concern	.69
Accident Prevention/Safety	.65
Sense of Purpose	.66

lifestyle domains, including physical health & exercise, psychological health, substance abuse, nutrition, environmental concern, social concern, accident prevention, and sense of purpose. Internal consistency of this measure range from fair to excellent (.65 to .91) and overall demonstrates good psychometric properties. Scores can be summed across domains to indicate of the presence of positive lifestyle habits. Please refer to Table 2 for alpha reliabilities for the LHQ-B measure from the current sample.

Quality of life inventory (QOLI). The *QOLI* (Frisch, 1994) is a scale composed of 32 questions which include, "How important is health to your happiness?" These statements are rated on two Likert-type scale with one scale with 0 (Not important) to 2 (Extremely important) and the other scale with -3 (Very) to +3 (Very). Domains of the

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QOL Index include total importance, total satisfaction, health, esteem, goals, money, work, play and learning with all domains included in the present study. The *QOL Index* had an internal consistency of .79 (Frisch, 1994). Scores were summed with higher scores indicating a more positive QOL rating. Please refer to Table 2 for alpha reliabilities for the QOLI measure from our current sample.

Nicotine and substance use. We measured alcohol, nicotine, and substance use through an informal questionnaire asking about the frequency and amount of current use. For nicotine use, participants were asked about the number of times per day (on average) that they use nicotine products (cigarettes, chewing tobacco, cigars, etc.). Alcohol use was determined by asking participants to estimate the rate of alcohol consumption (per standard unit) per week. Similarly, participants were asked to report the number of times per week they used marijuana. A separate question also asked about the use of "other substances" per week.

Chapter 3

Results

Prior to the data analysis, QOL data, schizotypy data, and health behavior data were examined for outliers, missing data, and normality. Reported significance levels are two-tailed unless otherwise noted. Analyses of variance (ANOVA) and Pearson product correlations were used to identify potential confounding variables that could bias our main analyses such as age, ethnicity, and gender. Most data met normal assumptions, although we found significant positive skew for our substance use variables (alcohol, marijuana, and nicotine). Thus, most participants reported no (or very little) use of these substances. These variables were ultimately dichotomized and Chi Square analyses were used to examine evidence for our hypotheses involving these variables (described in greater detail in the Results section). Chi-Square was also used to determine relationship between gender and alcohol, marijuana, and nicotine use. It was found that there were only marginally significant relationships between gender and nicotine use (χ=3.13, p=.07), however, there were significant relationships between gender and alcohol use (χ=4.19, p=.04) and gender and marijuana use (χ=18.59, p>.001) with females having higher rates of alcohol use and males having higher rates of marijuana use. Please refer to Tables 3, 4, and 5 for additional information related to the Chi-Square analyses.

T-Tests were conducted to identify confounding variables. Significant gender differences were found within the SPQ and QOL total scores. Males scored significantly higher [t(1, 393) = 2.093, p= .037] on the QOL total score than females: M(SD)2.13(1.35) & 1.83(1.38), respectively. However, females scored significantly higher on the SPQ [t(1,393) = -.2829, p< .01] than males: M(SD) 86.77(20.09) & 80.81(20.17), respectively. Due to these differences, gender was added as a covariate in the regression model.

Table 3

Bivariate Correlations Between Health, Substance, and QOL Domains

	SPQ total	Health behaviors (LHQ)	Nutrition (LHQ)	Nicotine use	Alcohol use	Marijuana use	Quality of life (total)
1. SPQ Total	—	—	—	—	—	—	—
2. Health Behaviors (LHQ)	0.337**	—	—	—	—	—	—
3. Nutrition (LHQ)	0.112*	0.508**	—	—	—	—	—
4. Nicotine Use*	1.82**	-0.041	0.003	—	—	—	—
5. Alcohol Use*	0.038	0.041	0.091	0.136**	—	—	—
6. Marijuana Use*	-0.047	0.032	0.074	0.191	0.136	—	—
7. Quality of Life	0.419**	0.475**	0.252**	0.097	0.012	0.043	—

** indicates significance under .01, * indicates significance under .05

Table 4

Chi-Square Analyses Between Gender and Dichotomized Substance Use Domains

	Pearson chi-square	*df*	Sig.
Nicotine use	3.132	1	.077
Alcohol use	4.194	1	.041
Marijuana use	18.593	1	.000

Table 5

Descriptive Statistics for Each Measure Across Levels of Schizotypy and ANOVA Results

	Schizotypy groups						ANOVA		Post hoc
	Low		Med		High				
Measure	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*	
SPQ-BR total score	66.9	11.8	83.5	20.1	113.5	9.3			
Health behaviors (LHQ)	.15	1.05	-.42	.96	-.66	1.22	17.51	>.001	L > M > H
Nutrition (LHQ)	.04	1.02	-.23	.99	.01	1.20	3.16	.043	L > M > H
Nicotine use[a]	-.11	.58	.10	1.16	.63	1.80	7.21	.001	H > M > L
Alcohol use[a]	-.02	1.02	.74	.97	-.29	.48	1.97	.141	NS
Marijuana use[a]	-.94	.79	.13	1.26	-.16	.25	2.66	.071	NS
QOL raw score	2.52	1.20	1.61	1.27	.80	1.51	36.95	<.001	L > M > H
Lifestyle total	.30	2.74	-.97	2.66	-.77	3.35	2.66	.071	L > H > M

[a]non-dichotomized variable used (also see Chi Square Analyses for these variables)

Two-tailed bivariate correlations were used to assess the relationship between schizotypy symptoms (positive, negative, and disorganized) and indicators of QOL and healthy lifestyle behaviors. An ANOVA was used to assess between-group differences in levels of QOL (QOL) and health/lifestyle behaviors in people with schizotypy. Levels of schizotypy were trichotomized into high, medium, and low categories for these analyses. High levels of schizotypy were defined as scores above 3.61; medium levels of schizotypy were defined as scores in the 2.60 - 3.60 range; low levels of schizotypy were defined as 2.59 and below. These groupings are based on 1.5 standard deviations above and below the mean. Table 6 provides basic descriptive information (e.g., mean scores & standard deviations) for each measure used in this project; this information is organized according to levels of schizotypy (low, medium, high).

In order to test *Hypothesis #1,* bivariate correlations were conducted to determine if there were any significant relationships between our schizotypy, lifestyle, and QOL variables (see Table 6). Higher levels of schizotypy was related to reductions in health behaviors ($r = -.337$, $p > .001$), poorer overall nutrition ($r = -.112$, $p = .026$), more problematic overall lifestyle patterns ($r = -.223$, $p > .001$), and lower overall quality of life ($r = -.419$, $p > .001$). Individuals that scored higher on the SPQ were also found to report significantly greater tobacco use ($r = .182$, $p > .001$).

To further test *Hypothesis #1 we also conducted a* one-way ANOVA to examine whether or not levels of schizotypy (high, med, low) were related to QOL or problematic health behaviors. The results suggested that there were statistically significant differences between high, medium, and low groups and QOL behavior $F(2, 392) = 36.95$, $p > .001$,

Table 6

Chi-Square Analysis of Low, Medium, and High Groups in Relation to Nicotine, Alcohol, and Marijuana Use

	Low M (SD)	Med M (SD)	High M (SD)
Alcohol use	.58 (.50)	.65 (.48)	.45 (.51)
Nicotine use	-.10 (.30)	.15 (.35)	.26 (.44)
Marijuana use	.05 (.21)	.12 (.33)	.06 (.25)

health behaviors $F(2, 392)= 17.51$, $p > .001$, nutrition $F(2, 392)= 3.16$, $p= .043$, nicotine use $F(2,392)= 7.21$, $p= .001$, and overall lifestyle $F(2, 392)= 9.83$, $p > .001$.

Consistent with our predictions, post-hoc tests using the Bonferroni correction found that there were statistically significant differences between low (M=2.52, SD= 1.20), medium (M=1.61, SD= 1.27), and high (M= .80, SD= 1.5) groups in relation to QOL behavior with individuals scoring low schizotypy symptoms reporting the highest level of QOL satisfaction. This suggestions that individuals with higher levels of schizotypy report lower QOL satisfaction than individuals that score low and medium levels of schizotypy. Additionally, post-hoc analyses found statistically significant differences between low (M= .15, SD= 1.05), medium (M= -.42, SD= .96), and high (M= -.66, SD= 1.22) groups and health behaviors, statistically significant differences between low (M= .04, SD= 1.02), medium (M= -.23, SD= .99), and high (M= .01, SD= 1.2) groups and nutrition, statistically significant differences between low (M= -.11, SD= .58), medium (M= .10, SD= 1.16), and high(M= .63, SD= 1.8) groups and nicotine use, and statistically significant differences between the low (M= .30, SD= 2.74), medium (M= -.97, SD= 2.66), and high (M= -.77, SD= 3.35) groups in relation to total lifestyle satisfaction.

In order to examine hypothesis #2 multiple hierarchical linear regression models were constructed to examine the unique variance associated with our variables of interest. Within this model, QOL was designated (and related sub-domains) as our DV. Gender was added in the first step of each model regression model in order to control for potential gender differences within our regression model. Step 2 in our model was used to enter the IVs of schizotypy and lifestyle. Levels of schizotypy (β= -.627, p > .001) and lifestyle behaviors (β= 1.50, p >.001) were found to significantly predict QOL above-and-beyond the influence of gender. The third step of our model was used to look at the potential moderating effects of lifestyle and schizotypy on QOL through the creation of an interaction term (i.e., LHQ x SPQ). However, there was no evidence for moderation when examining the results of our analyses.

Finally, we created a regression model in order to examine the overall contribution of all variables to QOL. In this model, all independent variables were entered in the same step and QOL was designated as the dependent variable. Gender was controlled for and not significant within the model (β= 0.45, p = 0.28, R^2= .480). The results suggested that scores from the SPQ "interpersonal" domain (β=-.253, p >.001), lifestyle "health" domain (β= .214, p >.001), and lifestyle "psychological health" domain (β=.292, p >.001) each significantly contributed to Quality of Life. Specifically, individuals that measured higher on the SPQ interpersonal factor scored lower in Quality of Life [t(1,393)= -.517, p >.001] while individuals that measured higher in physical health [t (1,393)= .471, p >.001] and/or psychological health [t(1,393)= .569, p >.001] measured higher in Quality of Life. These results suggest that while not all of the factors of our assessments were significant predictors, there are some that can be identified.

Chapter 4

Discussion

Prior research suggests that there are significant health issues that affect individuals diagnosed with schizophrenia contributing to poorer quality of life and early mortality. However, very little is known about when these issues arise during the course of schizophrenia or if these issues are also relevant during the prodromal stages of illness or in individuals considered to be at "high risk" for psychosis. In order to address this questions, the current study collected data from 395 undergraduate students regarding lifestyle behaviors and general quality of life across levels of schizotypy.

We found general support for our first hypothesis were Individuals with higher levels of schizotypy endorsed poorer QOL satisfaction, poorer health behaviors, poorer nutrition, and poorer overall lifestyle satisfaction than individuals with low or moderate schizotypy. Additionally, individuals with high levels of schizotypy endorsed more nicotine use than individuals in the low or medium groups. This finding is consistent with earlier research that reported higher rates of nicotine use in individuals with schizophrenia when compared to the general population (Davis et al., 2002; Samele et al., 2007). While speculative, higher nicotine use may also be a contributing factor to the lower QOL, poorer health behaviors, and poorer lifestyle satisfaction that we found in our high schizotypy sample since these outcomes may reflect the consequences of increased nicotine use. In general, a pattern of poor health behaviors and poor nutrition in our high l schizotypy group could (ultimately) increase the likelihood of developing chronic and serious health problems later in life. If individuals in our high schizotypy group develop schizophrenia, the research literature suggest that the potential consequences of these

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problematic lifestyle behaviors can include an earlier mortality (Brown, 1997), an increased likelihood of developing obesity, diabetes, and hypertriglyceridemia (Goff et al., 2005) as well as cardiovascular disease (Beebe, 2008).

For our second hypothesis we anticipated that lifestyle/health behaviors would moderate the relationship between schizotypy and QOL. However, our results did not support this hypothesis. Despite this fact, both lifestyle and health behaviors and schizotypal symptoms were found to independently have an impact on QOL. The implications of this find might suggests that lifestyle interventions for people with schizotypy may be useful in improving overall wellbeing, but not sufficient when conducted alone (i.e., interventions should also target symptom reduction to be optimally effective). Additionally, it may be possible that the relationship between QOL and health behaviors and schizotypal symptoms involves factors that we did not specifically examine (e.g., socioeconomic status). Even if this is the case, our exploratory regression analyses provide partial evidence for the influence of symptom severity (i.e., SPQ interpersonal scale), physical health, psychological health, and alcohol use in the prediction of QOL.

Future research on these specific variables may ultimately contribute to the development of preventative strategies that are related to improved quality of life among those with schizophrenia-spectrum conditions. For example, increasing the availability and utilization of blended psychological services that highlight both lifestyle/health guidance (exercise courses, nutritional education, etc.) with the mental health care that addresses interpersonal effectiveness (e.g., strategies to communicate more effectively in interpersonal interactions) may be more effective than current interventions that tend to

focus on "positive" symptoms. Although nicotine use was not related to QOL in our study, targeting nicotine use is still strongly recommended considering the long-term health consequences related to nicotine use (i.e., heart/lung disease) that will likely reduce QOL in the future.

Contrary to our predictions, our study found that nutrition and physical activity in individuals with higher levels of schizotypy were not significantly different from individuals with lower levels of schizotypy. The average age of our participants was 20.6, which may have an effect on physical activity levels. Research has shown that younger individuals report more motivation and intention to engage in sports and older individuals (Guzman & Kingston, 2012). The average age of our participants may be a confounding factor since younger individuals may be more likely to engage in athletic activity than older individuals regardless of levels of schizotypy. Every person in our sample is enrolled at a four-year, public university that offers fitness resources such as a gym, pool, exercise classes, and intermural/organized sports making the materials for physical activity accessible to all students. These programs may also address proper nutrition, making it more likely that individuals attending college may have more accessibility to education about proper eating habits and nutrition. Colleges and Universities should continue to offer health and nutrition related activities to promote a healthier lifestyle amongst students. It is possible that by offering activities promoting a healthy lifestyle, all individuals regardless of measured schizotypal symptoms may benefit. Additional research and information is needed in this area.

There are several limitations of our findings that we acknowledge. First, our sample consisted of primarily college age individuals at one Northeastern University.

This may have limited our sample to a very specific portion of the population. The majority of the individuals in our sample were college age students (18 to 22). Many individuals in our sample were also of similar socioeconomic statuses and were able to afford higher education costs. Second, many of our measure involved self-report. This format is problematic since there may be a number of response biases such as *social desirability* or *defensiveness* that can be introduced. Additionally, as reported in our study, individuals with higher levels of schizotypy tend to have poorer functioning in numerous domains. Therefore, individuals with even more serious impairments may be less likely to enroll in college and, therefore, may not be adequately captured in our sample. The failure of our study to find evidence for moderation could reflect a *Type II* error where elements of our research methodology, or characteristics of our sample, interfered with our ability to detect moderation. We believe that future research should strive to better account for these possible considerations and continue to look for complex moderation effects along with independent factors that contribute to QOL and other important outcomes in the schizophrenia-spectrum conditions.

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Appendix

Power Analyses

According to power analyses, a minimum sample of 100 would be necessary to identify a significant relationship schizotypy, QOL, and health behaviors assuming a small effect size (r=.09), 3 predictors in the model, and using the .05 confidence level to ensure a 90% likelihood of identifying the relationship. Given the proposed sample size (n=200) and assuming a medium effect size, the power for detecting a significant relationship would be .95, suggesting that the proposed study would be sufficiently powered.