A general measure of domain-specific quality of life and functional impairment

Michelle E. Roley

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A General Measure of Domain-Specific Quality of Life and Functional Impairment

by

Michelle E. Roley

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the

Master of Arts Degree in Clinical Psychology

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December 2013
An Abstract of

A General Measure of Domain-Specific Quality of Life and Functional Impairment

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A questionnaire that measures domain-specific quality of life and functional impairment is needed to provide a comprehensive tool that can be used in clinical and research settings. To accomplish this, a combined measure of quality of life and functional impairment is proposed. Quality of life measures an individual’s subjective satisfaction of self-indicated important life domains (Becker, Curry, & Yang, 2009; Frisch et al., 2005; Frisch, Cornell, Villanueva, & Retzlaff, 1992). Functional impairment measures the impact of symptoms on a specific domain of life, such as work or social relationships (Eiser, 2008; Endicott & Dorries, 2009; Greer, Kurian, & Trivedi, 2010). The combined measure was assessed for reliability, validity, and factor structure. Results indicate that the QOLaFI is promising with revisions.
For my parents, Jim and Gladys, my sister and brother in-law, Brandie and Moe, and my brother and sister in-law, Jimmy and Lisa for their continued love and support. Additionally, to my God mother, Aunt Glad, who was taken too soon from me. I would not be the person I am today without you. For my niece, Taylor, and nephews, Jarod and Silas, you can be anyone you want to be, so do something amazing with your lives. I love you!
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List of Abbreviations

AGFI ……………… Adjusted Goodness of Fit Index
AIC ……………… Akaike Information Criterion
AU ……………… Autonomy subscale

BAI ……………… Beck Anxiety Inventory
BDI ……………… Beck Depression Inventory

CF ……………… Cognitive Functioning subscale
CFA ……………… Confirmatory Factor Analysis
CFI ……………… Comparative Fit Index
CGI ……………… Clinical Global Inventory

FAST ……………… Functional Assessment Short Test
FI ……………… Functional Impairment
FIAU ……………… Functional Impairment Scale – Autonomy subscale
FICF ……………… Functional Impairment Scale – Cognitive Functioning subscale
FILA ……………… Functional Impairment Scale – Leisure Activities subscale
FISR ……………… Functional Impairment Scale – Social Relationships subscale
FIWS ……………… Functional Impairment Scale – Work/School subscale

GAF ……………… Axis V Global Assessment of Functioning

HAM-D ………. Hamilton Depression Rating Scale
HR-QOL ………. Health-Related Quality of Life

ICC ……………… Interclass Correlation Coefficient
IQOLA ………… International Quality of Life Assessment Project Group
LA .................. Leisure Activities subscale
LE .................. Living Environment subscale
LFQ ................ Life Functioning Questionnaire
LIFE ................ Longitudinal Interval Follow-up Evaluation
LIFE-RIFT ........ Longitudinal Interval Follow-up Evaluation – Range of Impaired Functioning Tool
LSAS ............... Leibowitz Social Anxiety Scale

MCAR ................ Little’s Missing Completely at Random
MCAS ............... Multnomah Community Ability Scale
MC-SDS ............ Marlow-Crowne Social Desirability Scale
MDD .................. Major Depressive Disorder
ML .................. Maximum-likelihood estimation

NIMH ............... National Institute of Mental Health

PANSS ............... Positive and Negative Affect Scale
PH .................. Physical Health subscale
PTSD ............... Post Traumatic Stress Disorder

Q-LES-Q-SF ........ Quality of Life Enjoyment Satisfaction Questionnaire – Short Form
QOL .................. Quality of life
QOLaFI ............. Quality of Life and Functional Impairment measure
QOLLA ............. Quality of Life Scale – Leisure Activities subscale
QOLLE ............. Quality of Life Scale – Living Environment subscale
QOLI ............... Quality of Life Inventory
QOLPH ............. Quality of Life Scale – Physical Health subscale
QOLSRSR ........ Quality of Life Scale – Social Relationships subscale
QOLWS ............ Quality of Life Scale – Work/School subscale

RMSEA ............ Root Mean Square Error of Approximation
SAS .................. Social Adjustment Scale
SDS ................ Sheehan Disability Scale
SES ................ Socio-economic Status
SF-12 ............... Medical Outcomes Study 12-item Short Form Health Survey
SF-36 ............... Medical Outcomes Study 36-item Short Form Health Survey
SIAS ................ Social Interaction Anxiety Scale
SLOF ............... Strauss-Carpenter Level of Function Scale
S.QUA.L.A .......... Subjective Quality of Life Analysis
SR .................... Social Relationships subscale

TLI .................. Tucker-Lewis Index

U.S. .................. United States
UVI .................. Unit Variance Identification

VIF .................... Variance Inflation Factor

WHO .................. World Health Organization
WS .................... Work/School subscale
Chapter 1

Introduction

The National Institute of Mental Health (NIMH) and the World Health Organization (WHO) have called for better understandings of disorder remission and treatment effectiveness (National Institute of Mental Health, 1999; World Health Organization, 2006). As a result, there has been momentum for a well-rounded measurement of treatment effectiveness in the form of broad outcome measures (Lebowitz & Rudorfer, 1998). The WHO defines health as the absence of symptoms and a general state of positive well-being (Becker, 2009; World Health Organization, 2006). Two constructs, quality of life and functional impairment, have been identified in the literature to capture the positive aspects of health (Altshuler, Mintz, & Leight, 2002; Endicott & Dorries, 2009). For example, Wyrwich et al. (2010) found that when adding the Q-LES-Q-SF, a domain-specific self-report measure of quality of life, there was a large effect on overall life satisfaction ($\beta = .66$) compared to including only the CGI, a clinician-rated measure of global functional impairment, and the HAM-D, a self-reported depression symptom-severity measure, which only had a small negative effect on overall life satisfaction ($\beta = -.11$).
Quality of life measures an individual’s subjective satisfaction of self-indicated important life domains (Becker et al., 2009; Frisch et al., 2005; Frisch et al., 1992). Additionally, functional impairment is defined as the amount of interference caused by specific symptoms or behaviors connected to a disorder (Becker, 2009; Cacilhas et al., 2009; Rosa et al., 2007; Sheehan, 2008, 2011) and can be assessed with regard to the impact of symptoms on specific domains of life, such as school or leisure activities (Eiser, 2008; Endicott & Dorries, 2009; Greer, Kurian, & Trivedi, 2010). Despite their identification as useful constructs to capture the positive aspects of health, neither are considered or if they are considered they are secondary to symptom reduction measures in treatment outcome research (Frisch et al., 2005).

The goal of the current study is to create a combined disease-general measure of domain-specific quality of life and functional impairment that is useful across a wide array of mental health disorders and varying severity levels and can be used in research and clinical practice. In the next sections, the development, psychometric properties, and logistical considerations for implementation of currently available measures will be reviewed to provide evidence for the need of a new measure of quality of life and functioning. First, however, the theory behind quality of life and functioning will be discussed to better understand what is meant by quality of life and functioning.

1.1 Theoretical Considerations

In this section, quality of life and functioning will be discussed on a theoretical level. Sprangers and Schwartz (1999) developed a model of quality of life that applies to the proposed measure in this study. Specifically, Sprangers and Schwartz’s (1999) model identifies a catalyst (e.g., depression) that leads to mechanisms (e.g., coping, social
comparison) that lead to a response shift (i.e., changing one’s response to their symptoms, changing one’s actual symptoms) that then lead to perceived quality of life. Both mechanisms and response shifts are affected by antecedents (e.g., socioeconomic status, culture, personality) to thereby influence one’s perceived quality of life (Sprangers & Schwartz, 1999). To set into the context of the focus for the current study, mental health disorders serve as catalysts that then trigger specific mechanisms that lead to response shifts, which then impact one’s perceived quality of life. Essentially, assessing one’s perceived quality of life answers the question of whether a treatment alters mechanisms that lead to a response shift. Thus, clinician-rated measures of quality of life and functioning and measures that do not ask the client to rate the level of importance of each domain are missing critical information on understanding subjective quality of life and functioning.

However, problems arise in the Sprangers and Schwartz (1999) model because of the inability to distinguish between a change in mechanism and simply a change in response shift (Rapkin & Schwartz, 2004). Thus, Rapkin and Schwartz (2004) revised the model to include self-appraisal and meaning. Several studies have examined the role of appraisal, that is, how one perceives oneself, and meaning, the level of value placed on particular areas of life, might explain how chronically ill patients or patients with permanent disabilities report higher levels of quality of life than non-chronically ill or non-disabled patients (for a review of these studies see Rapkin & Schwartz, 2004). Based on the findings that individuals evaluate their quality of life in relation to how they appraise themselves and the meaning they attach to a particular domain, Rapkin and Schwartz (2004) recommended that measures of quality of life be broad and include an
assessment of self-appraisal and meaning. Further, the Rapkin and Schwartz (2004) model necessitates the need to assess domains that are relevant to the quality of life of the individual at the time of the quality of life assessment. Thus, someone who has a severe and persistent mental health concern will have a different frame of reference than someone who has a less severe mental health concern. Further, the Rapkin and Schwartz (2004) model provides evidence for the inclusion of an assessment of the level of importance an individual places on a given domain.

The following theoretical model provides further rationale for the present study in that it sets the tone for the need of a combined measure of quality of life and functioning. Hoagwood et al. (1996) model of outcomes emphasizes a balanced assessment of symptom presence/absence, quality of life, and functioning to capture outcomes of an individual in the context of their environment and individualized treatment plan. The model is based on developmental theory and builds off the Hargreaves and Shumway (1989) model that had four domains of outcomes including clinical (i.e., symptom severity), functioning, quality of life, and safety (Hoagwood et al., 1996). Most mental health outcome assessments emphasize safety and symptom presentation, while far fewer assess quality of life and functioning (Hoagwood et al., 1996). Hoagwood et al. (1996) postulated that there was no comprehensive model of outcomes to guide the field in making informed decisions about outcome assessment. Even with Hoagwood et al. (1996) comprehensive model, little weight has been given to the assessment of quality of life and functioning in relationship to psychopathology. More attention to understanding the constructs of quality of life and functioning will be given to help the reader understand why there is a deficit in utility of both constructs in outcomes assessment.
1. 2 Conceptual and Methodological Issues in Measuring Quality of Life and Functional Impairment

Although functional impairment and quality of life are different constructs, they are related to one another (Endicott & Dorries, 2009; Frisch et al., 2005). As evidence of this, a quality of life measure called the Q-LES-Q was compared to a functional impairment measure called the CGI, where a moderate to strong negative relationship was found ($r = -.34$ to $-.68$; Endicott, 1993). In another study that compared the WHO-DAS-II (a functional impairment measure) and the QOLI (a quality of life measure), correlations ranged from $r = -.17$ to $-.60$ (Chavez et al., 2005). Similarly, the correlation between the GAF and the 16 dimensional HR-QOL measures was .060 (Granô, Karjalainen, Suominen, & Roine, 2011). An example of how the two constructs differ is that not all functional impairment domains have a comparable quality of life domain (i.e. cognitive functioning). Further, question wording differs quite substantially between functional impairment and quality of life questionnaires, where functioning questionnaires ask about the level of disability experienced in a given domain while quality of life questionnaires ask about the level of satisfaction in a given domain. Despite that quality of life and functioning assess different constructs, previous authors have confounded the two. For example, Altshuler et al. (2002) reviewed several measures to provide support for their creation of a new “functioning” measure called the Life Functioning Questionnaire (LFQ). However, the LFQ includes questions on quality of life. To address the call from NIMH and the WHO to adequately assess health, the constructs being measured in a questionnaire need to be clear, and both quality of life and functioning need to be assessed.
The following example is included to illustrate how not including an assessment of both constructs can be problematic. One component often considered in quality of life measures is an individual’s satisfaction with their financial situation. Depression could affect finances in the sense that depressed individuals may miss work or cannot hold a job because of their symptoms. However, when clinicians are considering a treatment approach and whether that treatment will influence a specific domain such as financial functioning, the conceptualization is distinctly different (Becker, 2009). When conceptualized, financial situation is assessed by considering the reduction in depressive symptoms and how it improves the individual’s ability to find a job or to not miss days of work (Endicott & Dorries, 2009), but reducing depression symptoms does not necessarily equate that the individual will be more satisfied with where they stand on the economic ladder. Therefore, if the individual were only given a measure of quality of life that included satisfaction with financial situation, the treatment may appear to have not worked. However, if a measure of functional impairment was also included, then an understanding of the treatment effectiveness in helping the individual attend work regularly or find a new job could be had. If an individual is experiencing the most impairment in cognitive abilities, social functioning, and sleep habits, a clinician is going to focus on those areas of greatest impairment. If only a quality of life measure were given, the individual may rate less impaired areas like financial situation as important but also rate that their financial situation has not changed in the course of treatment, while cognitive functioning, social functioning, and ability to sleep well will not have been assessed. This is problematic because it would appear that the treatment was ineffective even though the individual’s cognitive, social, and sleep impairments may have improved.
significantly and were the original goals in treatment. As illustrated, both constructs are important and provide unique information on the same constructs.

So far, quality of life and functioning have both been defined, theoretical and common methodological errors have been reviewed. Next, issues related to how quality of life and functional impairment are measured are discussed.

1.3 Measurement Considerations of Functional Impairment and Quality of Life

An issue to consider is whether functional impairment and quality of life measures should be disease-specific or disease-general. Disease-specific measures can be either for physical health diseases, which are not appropriate in the context of mental health disorders because questions are designed to target aspects of the physical health disease, or mental health disorder-specific. Disease-specific measures are only applicable for the given disorder being assessed (de Boer, Spruijt, Sprangers, & de Haes, 1998). Although disease-specific measures have proven clinical utility and disease-specific research applicability, findings from disease-specific measures do not translate across disorders (Patrick & Deyo, 1994). Given the high comorbidity of mental health disorders and the overlap in symptoms in mental health disorders (Balta & Paparrigopoulos, 2010; Gonda, Fountoulakis, Kaprinis, & Rihmer, 2007; Vázquez, Torres, Otero, & Diaz, 2011), using disease-specific measures would not be parsimonious and would be a burden on clients, staff, and resources. Thus, having a general measure of quality of life and functional impairment that includes an assessment of the level of importance would best meet the needs of mental health care providers and patients and the calls from NIMH and the WHO.
Another issue to consider is whether the measure should be clinician-administered or patient self-report or self-report interviews. Clinician-rated measures often increase the cost of evaluating interventions in research and in practice settings (Sheehan, Harnett-Sheehan, & Raj, 1996). Additionally, Clinician-rated measures have several biases (e.g., a) anchoring bias where there is a preference toward weighing one component more heavily, b) recency bias where rely on information that was most recently obtained, and c) saliency bias where rely on only the most prominent information) that can be avoided with the use of self-report measures (Croskerry, 2003; Kassirer & Kopelman, 1989). Even though self-report measures have their own set of biases, based on the theoretical model purported by Rapkin and Schwartz (2004), self-report measures must be used because of the necessity to assess self-appraisal. Interviews place a demand on staff and time. Thus, little is gained by using interviews over self-report questionnaires.

Another issue is assessing the level of importance that an individual places on each domain. Although, the Rapkin and Schwartz (2004) model also dictates that the level of importance of each domain be assessed, none of the currently available clinician administered measures of functional impairment, and only one currently available self-report measure of quality of life assesses the level of importance an individual places on each domain. The level of importance is also essential to understanding clients’ treatment goals when working with clinical populations because therapists can tailor treatments that best account for clients’ needs.

Functioning and quality of life measures can be broken down into specific domains of life such as work, school, parenting, peers, finances, etc. (Frisch et al., 2005; Frisch et al., 1992) or can be overall measures (e.g., the GAF, Luborsky, 1962; CGI, Guy,
1967; Sheehan Disability Scale, Sheehan, 1983). Overall functioning and quality of life measures, which are often brief, and do not comprehensively address domains, have been shown to be less useful in understanding quality of life (Frisch et al., 2005) and functioning (Endicott & Dorries, 2009) compared to domain-specific measures of quality of life. Breaking down these constructs into domains helps to better understand how functioning and quality of life impacts individuals (Endicott & Dorries, 2009; Frisen, 2007; Gadermann & Zumbo, 2007; Goldberg & Harrow, 2005; Greer et al., 2010; Hall, Krahn, Horner-Johnson, & Lamb, 2011; Ozechowski & Liddle, 2000). Research has pointed to the usefulness of assessing domain-specific measures over overall measures (Greer et al., 2010). Without a comprehensive measure of domain-specific quality of life and functioning, advancing treatments to better meet the rising cost of healthcare (Baker, McFall, & Shoham, 2008) and impairment concerns caused by mental health disorders (Andrews, Sanderson, Slade, & Issakidis, 2000) is not feasible.

1.4 Functional Impairment Measures

Now we will shift focus to currently available measures of functioning and quality of life in order to examine strengths and weaknesses of the available measures. The review of functional impairment measures will start with brief measures that are clinician administered and move into more comprehensive self-report measures.

1.4.1 Axis V Global Assessment of Functioning (GAF, Luborsky, 1962)

The GAF has one question of overall severity level that is clinician-rated (Endicott et al., 1976; Luborsky, 1962). The GAF score has a 0 – 100 scale, and is based on a collective evaluation of seven criteria (autonomous functioning; severity of symptoms; level of distress; impairment of symptoms on patient’s environment; patient’s
abilities; quality of interpersonal relationships; and number and degree of interest in things; Luborsky, 1962). A limitation of the GAF is that it is impossible to know what areas of life an individual is not functioning well. This makes setting treatment goals and assessing improvement unattainable. Further, Luborsky (1962) described disagreement between developers in the weight placed on each of the 7 components. This suggests that there is much variability in how the GAF score is assigned. Since this measure is only one question, examination of internal consistency cannot be had. Inter-rater reliability ranged from .65 (where 53% of agreement was within 5 points, 83% was within 10 points) to .90 in three studies (Luborsky, 1962). These findings highlight the problems with the GAF. The correlation between the GAF and the Beck Depression Inventory was -.047, indicating poor concurrent validity (Granö et al., 2011).

1.4.2 Clinical Global Impressions (CGI, Guy, 1976).

The CGI is a three-item clinician-administered scale that assesses overall severity of disorder, improvement, and efficacy of treatment (Kadouri, Corruble, & Falissard, 2007). As previously stated, clinician-administered measures have their own biases and do not take into account the individual’s domains of importance. The CGI is another example of an overall measure, where it is not known about which areas of life are affected. The CGI has shown good predictive validity (6-week Leibowitz Social Anxiety Scale (LSAS) $r = .72, p < .01$; 12-week LSAS $r = .82, p < .01$; Zaider, Heimberg, Fresco, Schneier, & Liebowitz, 2003). The CGI also showed good discriminant validity with the QOLI ($r = -.45, p < .01$; Zaider et al., 2003). Although the CGI has shown poor to adequate concurrent validity (Social Interaction Anxiety Scale (SIAS) $r = .49$; LSAS $r = .59$; BDI $r = .48$; HAM-D $r = .36, p’s < .01$; Zaider et al., 2003).
1.4.3 Sheehan Disability Scale (SDS, Sheehan, 1983)

The SDS is a three-item clinician-administered measure that uses discretized visual analog scales to assess three domains of life (i.e., social relationship functioning, work functioning, and family functioning; Sheehan et al., 1996). The SDS has been previously validated, for example using two treatment studies of 476 patients with panic disorder only and 96 patients with panic disorder and major depression (Leon, Shear, Portera, & Klerman, 1992). Cronbach’s alpha were reported per treatment group (for five groups across two studies) and ranged between .56 and .86 (Leon et al., 1992). Given this much variability in the internal consistency of the measure, caution should be exercised when interpreting SDS results. Inter-item correlations were also cause for concern. First, there was wide variability between pre- and post- treatment assessments (pre- Work and Social item correlations ranged between .10 and .45 compared to post-.24 and .71; pre- Work and Family items ranged between .27 and .47, compared to post-.31 and .64; and the pre- Social and Family items ranged between -.06 and .57 compared to .44 and .74; Leon et al., 1992). Second, the variability across samples of the item-correlations is cause for concern. Specifically, the negative relationship between the social and family items, though .06 is arguably not a relationship at all, is contrary to the authors expected moderately sized correlation. Another limitation of the SDS is that there are other domains not assessed by this measure that may be impacted (e.g., leisure activity functioning, cognitive functioning). Indeed, the authors found that only 25% and 38% of the symptoms of panic disorder accounted for changes in the pre and post data (Leon et al., 1992).
1.4.4 Multnomah Community Ability Scale (MCAS; Barker, Barron, McFarland, Bigelow, & Carnahan, 1994)

The MCAS is a 17-item clinician-rated scale that assesses four functioning domains (adjustment to living, social functioning and behavioral problems, and overall functioning; Barker et al., 1994). The MCAS was created specifically for individuals with more severe impairment, such as individuals with schizophrenia and bipolar disorder (Altshuler et al., 2002; Barker et al., 1994). Inter-rater reliability ranged from .32 to .75 across the 17 items, with the total score inter-rater reliability of .85 (Barker et al., 1994). Test-retest reliability across a three-week period, ranged from .31 to .90 for the individual items, and had a total score test-retest reliability of .83 (Barker et al., 1994). The overall score reliabilities were excellent; however, the item-level reliabilities were quite low for six items. Given that the authors designed the measure so that each item could be used to predict outcomes, this is concerning. Validity assessed for this scale did not yield promising results. Intriguingly, acceptance of illness was positively correlated with age ($r = .19$), indicating that younger participants accepted their illness more than older participants did (Barker et al., 1994). This is not in the hypothesized direction and the correlation is very small. Further, the total score, which showed the best reliability, was not associated with age. The strongest correlation was between number of days in the hospital and the total score ($r = -.43$; Barker et al., 1994). Length of hospital stay should be strongly associated with lower functioning, but even here, the association is moderate. The findings demonstrate that the scale is mediocre at meeting the aims of the scale.

While each validity check could be picked apart in this document for the sake of saving space, please see Barker et al.’s (1994) article for additional results. Factor analysis was
briefly mentioned, but data were not provided to support the authors’ claims that the scale had four factors that corresponded with the MCAS’ subscales.

1.4.5 World Health Organization Disability Assessment Schedule II (WHO-DAS-II; WHO, 2000)

The WHO-DAS-II is the second edition of a semi-structured clinician-administered interview that assesses six domains of life (Chavez et al., 2005). The WHO-DAS-II is used internationally for a variety of physical and mental health disorders, and was intended to assess social functioning among individuals with psychotic disorders (Janca et al., 1996; Sousa et al., 2010). There have only been a few studies to examine the psychometric properties of the WHO-DAS-II. The scale was assessed cross-culturally in 11 samples of older adults with chronic physical health problems, where Cronbach’s alphas ranged between .90 and .97 (p. 6, Sousa et al., 2010). Similarly, Chwastiak and Von Korff (2003) found excellent internal consistency of the WHO-DAS-II with depressed adults (subscale $\alpha = .68$ to .95). As did Von Korff et al. (2008), ($\alpha$’s ranged = .79 - 94). Convergent validity was poor (SDS work scale, $r = .31$; social scale, $r = .28$; family scale, $r = .23$; and SF-12 mental summary component scale, $r = -.30$; Von Korff et al., 2008). In contrast, Chwastiak and Von Korff (2003) found good convergent validity (SF-36 subscales: pain scale, $r = -.46$; physical functioning, $r = -.77$; role functioning, $r = -.66$; role-emotional functioning, $r = -.49$; social functioning, $r = -.74$; mental health, $r = -.72$; and vitality, $r = -.62$). The mobility and self-care domains on the WHO-DAS-II are less applicable for less severely impaired individuals, as indicated by the effect size findings, ($d = .06$ and .03, respectively; Chwastiak & Von Korff, 2003).
CFA analyses of the WHO-DAS-II showed the hypothesized one-factor solution to be a poor fit for the data (“RMSEA range = .13 to .24; TLI range = .49 to .84; AIC range = 995.7 to 4263.9”; Sousa et al., 2010, p. 8). The two-factor solution proved to be a better, but still poor fit of the data (“RMSEA range = .09 to .23; TLI range = .11 to .90; AIC range = 254.0 to 2962.7”; Sousa et al., 2010, p. 8; “RMSEA range = .14 to .22; TLI range = .56 to .84; CFI range = .78 to .92”; Von Korff et al., 2008, p. 7). In contrast, Buist-Bouwman et al. (2008) also found evidence for a one-factor solution (“RMSEA = .02, TLI = .996, CFI = .992”; p. 192). Similarly, Rehm et al. (1999) concluded that the one-factor solution was a good fit of their data, though this was based entirely on factor loadings, as fit indices were not reported. In sum, while internal consistency was excellent, there is much debate about the factor structure of the scale and theoretically better fitting models have not adequately fit the data. The two-factor solution subscales do not make intuitive or theoretical sense. Specifically, learning, concentration, community, emotional, work, housework, walking, and standing all formed one factor, while washing, dressing, dealing, and friendship formed the second factor.

Despite the WHO-DAS-II limitations, it has demonstrated ability to distinguish impairments in mental health disorders. In a sample of 3,615 primary care patients, Luciano et al. (2010) utilized the WHO-DAS-II to differentiate individuals with MDD from individuals with milder depression by measuring level of functional impairment.

1.4.6 Additional FI Measures for Severe and Persistent Mental Illness.

Other measures of functioning created for individuals with severe and persistent mental illness include the clinician-rated Behavior and Symptom Identification Scale, a brief 32-item measure of daily role functioning only (Altshuler et al., 2002; Eisen, Dill, &
Grob, 1994). Another example is the Independent Living Skills Survey, a clinician or third-person informant rated measure designed to assess the impairment of severely impaired individuals, only assesses two domains of functioning: domestic and leisure (Altshuler et al., 2002; Wallace, 1986). These clinician-rated measures discussed are not comprehensive and are not appropriate for less severely impaired individuals. Further, the biases associated with clinician-rated measures are also present, and neither measure accounts for the client’s self-appraisal.

1.4.7 Social Adjustment Scale (SAS; Weissman & Bothwell, 1976)

The SAS has both self-report and structured interview formats (Altshuler et al., 2002; Weissman & Bothwell, 1976). It assesses satisfaction in six domains including work/housework/schoolwork, marriage, parenting, extended family, social activities, and leisure activities (Altshuler et al., 2002; Weissman & Bothwell, 1976). Good inter-rater reliability was found in a sample of depressed adults testing a pharmaceutical medicine ($r = .72$; Weissman & Bothwell, 1976). However, the SAS has been shown to have a gender bias (Keller et al., 1987). When it was developed, there was a more accepted gender role split wherein women worked, were homemakers, or were in school. In the present U.S. culture, it is acceptable and common for women to be expected to manage all three roles. Therefore, the SAS is not a sensitive enough measure to capture functioning of individuals now.

1.4.8 Longitudinal Interval Follow-up Evaluation – Range of Impaired Functioning Tool (LIFE-RIFT; Leon et al., 1999)

The LIFE-RIFT is an 8-item semi-structured interview that assesses four domains (work, recreation, interpersonal relationships, and global satisfaction) for impairment.
Despite having excellent reliability and validity, the LIFE-RIFT still lacks an assessment of cognitive functioning and living environment. Further, similarly to the GAF, which takes into account several domains to derive a total GAF score, the LIFE-RIFT relies on clinicians to consider several facets (for example, work encompasses employment, housework, and school) to decide the level of impairment the individual is experiencing. Although a formal assessment has not been conducted on the degree of consistency in clinicians making their decisions on the LIFE-RIFT, given the similarity of the task to the GAF, results from Luborsky (1962) can be extrapolated. Thus, it follows that there is likely inconsistency in clinicians’ decision-making process when making final decisions on the level of impairment experienced. Further, although the LIFE-RIFT has four domains, four separate confirmatory factor analyses revealed that a one-factor model (i.e., a total score) was a good fit for the data ($\chi^2$ range = .46 to 103.52, $p$’s > .05; $\chi^2/df$ range = .23 to 1.41; $AGFI$ range = .94 to 1.00; Leon et al., 1999). The LIFE-RIFT showed only moderate stability in within-subjects clinician-ratings ("ICC = .55", Leon et al., 1999) and with clinicians’ consistency with determining recovery ratings (ICC = .61; Leon et al., 1999).

1.4.9 Medical Outcomes Study 36-Item Short Form Health Survey (SF-36; Ware & Sherbourne, 1992)

The SF-36 is 36-item self-report measure of functioning used most often in physical health-related functioning research and practice (Altshuler et al., 2002). In the studies with depressed individuals, the internal consistency reliability has been very good ($r$ range = .77 to .94; Ware, Gandek, & IQOLA Project Group, 1994; $r$ range = .65 to .81, McHorney et al., 1994). Discriminant validity was assessed where correlations between
items of one scale were correlated with other scales and the SF-36 was found to have mixed ability to discriminate scales ($r$ range = .09 to .62; McHorney et al., 1994). Though the authors found mixed results, they did not provide a breakdown of item-level consistency or discriminant validity. In a two-factor principle components analysis, there was a strong correlation between the mental health domain and each of the three predicted subscale loadings: social functioning, role-emotional, and mental health ($r = .71, .81, .90$; McHorney, Ware & Raczek, 1993). Similarly, there were strong correlations between the physical health domain and the physical health subscales: bodily pain, role-physical, and physical functioning ($r = .77, .78, .88$; McHorney et al., 1993). Two subscales, vitality and general health were not expected to be part of either the physical or mental health subscales, though results are somewhat mixed for these two subscales. Vitality was moderately correlated with both domains ($r = .59$ and .57), while general health was strongly correlated with only the physical health domain ($r = .68$; McHorney et al., 1993). Even though the data suggest a measure with good construct validity and internal consistency, the data also point to a more important validity issue. Only some of the subscales are relevant for individuals with mental health concerns. Clinical validity was assessed by comparing samples patients with psychiatric-only to medical-only concerns; the physical health scales had no ability to distinguish the two groups (RV = .00, .07, and .14; McHorney et al., 1993). Further, the SF-36’s role functioning and physical functioning domains appear to have little relevance to clinical depression ($d = .10$ and .03 respectively; Chwastiak & Von Korff, 2003). Additionally, SF-36 was found to have a floor effect in individuals with depression 42% of the time, psychiatric conditions (40%), and impoverished individuals (31%). Additionally, a ceiling effect
was observed 73% of the time among individuals with uncomplicated medical conditions (McHorney et al., 1994). A modest ceiling effect was also observed among younger healthy and educated participants (McHorney et al., 1994).

1.4.10 Functional Assessment Short Test (FAST; Rosa et al., 2007)

The FAST is a 24-item Spanish measure created to assess domain-specific functional impairment among individuals with bipolar disorder (Rosa et al., 2007). The response format ranges from 0 (no problems) to 3 (severe limitation; Cacilhas et al., 2009). Internal consistency was excellent ($\alpha = .91$; Rosa et al., 2007; $\alpha = .95$; Cacilhas et al., 2009). One-week test-retest reliability was excellent, ($ICC = .98; p < .001$; Rosa et al., 2007). Concurrent validity with the GAF was excellent, ($r = -.90, p < .001$; Rosa et al., 2007). Comparatively, good concurrent validity was also found with the GAF ($rho = -.70, p < .001$), but was adequate with the Sheehan Disability Scale (work $rho = .62, p < .001$; social $rho = .55, p < .001$; family $rho = .54, p < .001$; Cacilhas et al., 2009).

Discriminant validity was assessed by comparing FAST scores with current state (euthymic, manic, depressed), where lower FAST scores were found for euthymic patients compared to manic and depressed patients ($18.55 + 13.19; F = 35.43; p < .001$; Rosa et al., 2007). Similarly, the FAST was able to discriminate between control and symptomatic groups ($3 CI = .25 - 7, z = 8.28, p < .0001$; Cacilhas et al., 2009).

An exploratory factor analysis revealed a five-factor solution accounting for 72.11% of the total variance (Cacilhas et al., 2009). The factor loadings revealed some problems with the scale. Specifically, four items on the interpersonal subscale had loadings in the .31 to .41 range, and one of those items (“Participating in social activities”) loaded on both the interpersonal and autonomy factors (Cacilhas et al., 2009).
1.5 Summary of the Best FI Measures Available

As can be concluded from the review of the functional impairment measures, the FAST and the LIFE-RIFT are the only measures with acceptable psychometric properties across the board. The downfall of the FAST is that the measure is only available in Spanish and Portuguese and is only designed to assess functioning among bipolar patients. The LIFE-RIFT is designed to be a clinician-administered measure, and as a result is questionably a good choice where the benefits would outweigh the drawbacks when working with clients who have mild to moderate symptoms.

1.6 Quality of Life Measures

This section examines currently available measures of quality of life. First, clinician administered measures will be discussed, and then self-report measures will be discussed.

1.6.1 Longitudinal Interval Follow-up Evaluation (LIFE; Keller et al., 1987)

The LIFE is a clinician-administered semi-structured interview that assesses eight domains of psychosocial QOL including interpersonal, sexual, recreation, global, work, student, household, and satisfaction (Keller et al., 1987). The psychosocial scale showed adequate to good inter-rater reliability (ICC = .54 to .98; Keller et al., 1987). The LIFE questions and response format mesh quality of life and functional impairment together in a non-interpretable fashion. For example, on the sexual activities domain, instructions say “rate the worst week for each of the past six months in terms of whether the patient’s ability to enjoy [quality of life] or engage [functional impairment] in sexual activities with another person has been impaired by psychopathology” (Keller et al., 1987, p. 544). The response scale ranges from 1 = “No, subject had no sexual relations with another
person during the past month for reasons other than psychopathology”, 2 = “No, subject had sexual relations during the past month and did not experience impairment in ability to enjoy or engage in sexual activities because of psychopathology”, 3 = “Mild impairment as result of psychopathology”, 4 = “Moderate impairment as a result of psychopathology”, 5 = “Severe impairment (including no sexual relations) as a result of psychopathology”, and 6 = “No information” (Keller et al., 1987, p. 544). Within the response format, only response option two clearly, but indistinguishably, assesses quality of life.

1.6.2 The Strauss-Carpenter Level of Function Scale (SLOF; Strauss & Carpenter, 1977)

The SLOF, designed for individuals with severe and persistent mental illness, is a 20-minute clinician-rated measure that assesses four domains including social relationships, work, symptomology, and global functioning (Altshuler et al., 2002; Strauss & Carpenter, 1977). The SLOF demonstrated adequate discriminant validity (Positive & Negative Affect Scale (PANSS) $r = .51$, CGI $r = .51$, GAF $r = .45$, $p < .001$; Cramer et al., 2000). The SLOF also demonstrated excellent sensitivity to treatment changes (ES = .89, $p < .001$; Cramer et al., 2000). However, as previously discussed, clinician-rated measures are costly and introduce biases that do not outweigh the benefit of self-report where clients are capable of providing their own self-appraisals.
1.6.3 Quality of Life Inventory (QOLI, Lehman, 1988)

The QOLI is a 143-item self- and clinician-report measure (Lehman, 1988). Internal consistency reliability was measured for both objective and subjective ratings for the QOLI and results indicated objective subscale alphas, in general, were lower than subjective alphas, and ranged from .35 to .87 (Lehman, 1988). Subjective subscale alphas ranged from .74 to .88 (Lehman, 1988). These findings provide support for the importance and utility of subjective self-ratings of quality of life. Test-retest reliability over a one-week interval was poor to excellent (Objective subscale \( r \) range = .29 to .98; Subjective subscale \( r \) range = .41 to .95; Lehman, 1988).

Construct validity was assessed by comparing intra domain correlations (i.e. subjective items with objective items on the same domain), which showed no correlation for nine out of fifteen domains (\( r \) range = -.04 - .27, \( p = ns \)) to small and moderate correlations for five domains (\( r \) range = .19 - .61, \( p < .01 \); Lehman, 1988). The authors found that depression and anxiety correlated strongly with QOLI (\( r \) range = -.17 to -.56, \( p < .05 \); \( r \) range = -.25 to -.33, \( p < .001 \)), while thought disorder showed no relationship to QOLI (\( r \) range = .06 to -.14, \( p = ns \); Lehman, 1988). The Subjective subscales of QOLI accounted for largest amount of variance (\( R^2 \) range = .40 to .57) compared to objective subscales (\( R^2 \) range = .14 to .27), diagnoses (\( R^2 \) range = .04 to .09), and demographics (\( R^2 \) range = .0 to .03; Lehman, 1988). Factor analysis was used to determine that a one factor model for each of the domains is appropriate (Lehman, 1988) though the author did not provide CFA statistics.
1.6.4 Subjective Quality of Life Analysis (S.QUA.L.A, Nadalet et al., 2005)

The S.QUA.L.A. is a two-part self-report measure of quality of life that assesses 22 domains of life (Nadalet et al., 2005). Part one assesses the level of importance of a particular domain and part two assesses the level of satisfaction with the domain (Nadalet et al., 2005). Internal consistency was good across samples (\(\alpha = .81\) to .88; Nadalet et al., 2005). Poor concurrent validity was found when compared to disorder-related factors (age of onset, duration, number of hospitalizations, and number of leisure activities engaged in \(r = -.32, p < .01\); Nadalet et al., 2005). Discriminant validity was excellent when compared to the PANSS, only three subscales were correlated, Art and Beauty \(r = -.30, p < .01\); psychopathology \(r = -.32, p < .01\); and money \(r = -.29, p < .01\); Nadelet et al., 2005). While convergent validity with the QOLI was poor to adequate \((r\) range = .27 to .56; Nadelet et al., 2005). Items such as “To be interested in political life”, “Justice”, “Freedom”, and “A good meal”, S.QUA.L.A; p. 79, Nadalet et al., 2005) are not intuitively relevant in the context of mental health interventions. Although the format provides a useful platform for understanding quality of life because it assesses self-appraised level of importance of domains, the S.QUA.L.A. is not a useful measure for assessing quality of life.

1.6.5 Life Functioning Questionnaire (LFQ, Altshuler et al., 2002)

The LFQ is a 14-item self-report measure of “role function” (Altshuler et al., 2002). The LFQ is similar to the SAS but gender neutral \((McNemar \chi^2 = 25.1, df = 1, p < .0001; Altshuler et al., 2002)\). Internal consistency reliability was found to be excellent \((\alpha \) range = .84 to .88; Altshuler et al., 2002) . Test-retest reliability was good \((r\) range = .71 to .77; Altshuler et al., 2002) . Concurrent validity was assessed comparing the LFQ
to depression and bipolar symptom severity where results indicated a strong positive correlation for depression ($r$ range = .43 to .75) and for bipolar disorder ($r$ range = .42 to .77; Altshuler et al., 2002). The LFQ subscales were compared for each sample (mania, depressed, and overall bipolar) to a measure of the SAS (a QOL measure) and the CGI (a FI measure) to assess construct validity. Results of construct validity were mixed, a strong correlation was found with the SAS ($r$ range = .57 to .86), but poor to good validity with the CGI ($r$ range = .14 to .77; Altshuler, et al., 2002). Findings suggest that the LFQ is a valid measure of social functioning (Altshuler et al., 2002), but also provides additional information on quality of life that the SAS is unable to provide (Altshuler et al., 2002). Further, as discussed when talking about the field not being clear about what they are measuring, the four subscales on the LFQ reflect an assessment of quality of life and functional impairment though this measure is supposed to measure functioning. The measure is being described under quality of life measures because three out of four questions were phrased in a manner that assessed quality of life. Specifically, how many arguments the individual experienced (with friends, family, or at work) reflects the quality of interactions with others (i.e., quality of life). How badly the individual’s feelings were hurt is another way to assess the quality of interactions with others. Finally, the level of subjective enjoyment (with friends, family, and at work) is another, more direct, assessment of quality of life. The only item to assess functioning was how frequently did the individual spend time with friends, family, or at work.
1.6.6 Quality of Life Enjoyment Satisfaction Questionnaire - Short Form (Q-LES-Q-SF, Endicott, 1993)

The Q-LES-Q-SF is a short form version of the Q-LES-Q which is a 93-item measure that assesses eight domains of quality of life including physical health, work, school, housework, leisure activities, social relationships, general activities, subjective feelings, and overall quality of life (Endicott, 1993). The Q-LES-Q-SF has shown good internal consistency reliability (subscale $\alpha$ range = .90 to .96, $p < .01$, Endicott, 1993; $\alpha = .84$ to .96, $p < .01$; Ritsner & Awad, 2005). Good one- to two- week test-retest reliability ($r$ range = .66 to .89, $p < .01$; Endicott, 1993) with adequate eight week test-retest reliability ($\kappa$ = .47 to .89, $p < .01$; Ritsner & Awad, 2005; $r = .56$, $p < .01$, Swan, Watson, & Nathan, 2009). The Q-LES-Q-SF had adequate to good discriminant validity compared to the CGI ($r$ range = -.34 to -.68; Endicott, 1993). Adequate to good concurrent validity was also found (Hamilton Depression Inventory (HAM-D) $r$ range = -.29 to -.72, $p < .01$, Endicott, 1993; Beck Depression Inventory (BDI; $r = -.69$, $p < .01$), Beck Anxiety Inventory (BAI; $r = -.47$, $p < .01$, Swan et al., 2009). The general QOL index score accounted for 95% of the variance of overall life satisfaction in a sample of healthy participants (Ritsner, et al., 2005), though it only accounted for 36% of the variance of overall satisfaction in a sample of anxious patients (Wyrwich et al., 2011). A confirmatory factor analysis found that only four factors should remain social relationships (eigenvalue = 2.72), physical health (eigenvalue = 2.27), subjective feelings (eigenvalue = 1.96), and leisure time activities (eigenvalue = 1.69; Ritsner et al., 2005). Further, the Q-LES-Q-SF items, though it has sound psychometric properties, was derived from four samples of Jewish or Arab Israelis with one of the following: major
depressive disorder, schizophrenia, schizoaffective disorder, or bipolar disorder, and taking either risperidone or olanzapine medications. It is unclear whether the Q-LES-Q-SF will yield similar findings in a US sample of individuals with less severe depression and anxiety symptoms or the US general population (Ritsner et al., 2005).

To summarize, The only measure available that captures the level of importance of each domain is the S.QUA.L.A., which had numerous concerns regarding its utility otherwise. The Q-LES-Q-SF is one of the best available quality of life measures, though the 8-factor model of QOL has not been assessed, and concurrent validity was not assessed so little is known about whether the Q-LES-Q-SF is actually capturing QOL. On the surface, having a subscale for overall QOL seems redundant. The LFQ and the QOLI both had subscales that seem important to capture when assessing QOL, though both of those measures have flaws.

1.7 Summary of Functional Impairment and Quality of Life

Despite an astounding body of research on quality of life and functional impairment and its potential implications in mental and physical health, it is often not considered a factor in evaluating health or treatment outcomes, or if it is considered, it is only secondary to symptom reduction (Frisch et al., 2005). Quality of life and functional impairment measure different constructs and both are important in better understanding health (Endicott & Dorries, 2009; Frisch et al., 2005). Further, by creating a combined measure of quality of life and functional impairment for use in interventions (i.e., framing well-being in the health term set forth by NIMH and the WHO), researchers would more adequately provide evidence for the utility of their interventions. To reduce the burden on mental health care providers, having a combined measure of QOL and FI would be
ideal given how similar the constructs are. Disease-general measures are best for use in mental health settings because of the overlap in symptoms across disorders and because of the high rates of comorbidity. Further, domain-specific measures are best for use in the context of therapy because the measures allow clinicians to parse apart which domains a client is having difficulty or is dissatisfied. Currently available measures of quality of life and functioning have flaws, as previously described. Additionally, the subjective appraisal of each domain has not been included in the less flawed available measures of quality of life and functioning. In summary, a newly constructed measure that encompasses both functional impairment and quality of life and includes questions addressing the subjective level of importance of each domain is needed.

1.8 Goals for Current Study

The overall goal of this study was to develop a reliable and valid disease-general measure of domain-specific quality of life and functional impairment that assesses the level of importance of each domain and is useful in determining the quality of life and functioning of individuals experiencing a range of mental health disorders at varying levels of severity. Having such a measure that is brief and easy to administer will provide clinicians with an empirically validated tool feasible to incorporate into their current practices. Additionally, this measure will be available for researchers interested in studying a wide array of disorders and constructs (e.g., depression, anxiety, PTSD, stress, adjustment). The combined measure will help to bridge the gap between the utility of either functional impairment or quality of life and meet the standard set forth by the NIMH and the WHO.
Chapter 2

Method

2.1 Measurement Development

In order to achieve the goals of this study, a combined measure of quality of life and functional impairment was developed. The measure is referred to as QOLaFI and is pronounced as “qualify”. Please refer to Appendix A to see the QOLaFI measure. The literature on quality of life and functional impairment was carefully consulted to determine the number of subscales to include in QOLaFI. Preliminarily, Flanagan (1978) completed a nationally-representative search for domains of QOL and found that participants rated “health and personal safety”, “work”, (though in present day and given a college student population, school seems comparable to work), relationships with significant other/children, and friends, and material comforts as the most central to quality of life. Based on prior validated measures of quality of life and functional impairment (e.g., QOLI, Lehman, 1988; LIFE-RIFT, Leon et al., 1999), QOLaFI has five domains for QOL, including social relationships, work/school, leisure activities, physical health, and living environment and five domains for FI, specifically social relationship functioning, work/school functioning, cognitive functioning, leisure activities, and autonomy. The number and quality of the questions included in QOLaFI were based on
research guidelines that underline the importance of model quality rather than sample size in confirming predictions of latent constructs in confirmatory factor analysis (Gagné & Hancock, 2006). QOLaFI has a closed-ended response format with a five-point Likert-type response scale, which is based on guidelines from previous research (Lietz, 2010; Rattray & Jones, 2007; Uebersax, 2006). Positively phrased items (items where responses indicate greater quality of life and higher scores indicate better functioning) were used to ease with scoring and interpretation of findings.

Items of quality of life and functional impairment were written using vocabulary appropriate for an eighth grade reading level so that adults with varying levels of education can understand the questions. To ensure that these standards were met, the built-in Microsoft Office feature was used. Office provided two tests, the Flesh Reading Ease test and the Flesh-Kincaid Grade Level test (Microsoft Office, 2011). Scores on the Flesh Reading Ease test range from 0 to 100, where higher scores equate to easier readability (Microsoft Office, 2011). Microsoft Office (2011) recommends that most documents range between 60 and 70 on reading ease. The QOLaFI measure had a reading ease score of 65.3. The Flesh-Kincaid Grade Level test provides a reading level based on U. S. normative data where scores are reported as grade levels (Microsoft Office, 2011). The Flesh-Kincaid grade level for the QOLaFI was 6.2, indicating that the QOLaFI is at the 6th grade reading level.
2.2 Measures

2.2.1 QOLaFI

QOLaFI has 103 items, 7 questions assessing level of importance, 49 questions assessing QOL ($\alpha = .94$), and 47 questions assessing FI ($\alpha = .95$). Quality of life was assessed by asking individuals to rate their level of satisfaction with each domain. Functional impairment was assessed by asking the extent to which individuals were able to function in each domain. Additionally, the level of importance of each domain was assessed by asking respondents to indicate how important each domain is to their well-being. The response format for the level of importance questions ranged from 1 (Extremely unimportant) to 5 (Crucial). The response format for the QOL questions ranged from 1 (Very dissatisfied) to 5 (Very satisfied), while the response format for the FI questions ranged from 1 (Terribly) to 5 (Very well).

2.2.2 Demographic Questionnaire

The demographic questionnaire included questions about gender, age, ethnicity, race, number of years in school, parents’ highest educational level, and perceived SES of family.

2.2.3 Comparison Measures of Quality of Life

2.2.3.1 Quality of Life Inventory (QOLI)

The self-report portion of the QOLI (Lehman, 1988), which included 33 items, was used to assess the convergent validity of the quality of life scale on the QOLaFI measure. The QOLI ($\alpha = .91$) assessed social relationships, work, school, and daily activity domains, in addition to living situation, which features eight subcomponents
(security, privacy, autonomy, cohesion, independence, influence, comfort, and current length of stay), frequencies of family and social contact, quantity of leisure activities, quantity of religious activities, finances, safety, and both physical and mental health (Lehman, 1988). The satisfaction questions have a response option of the following: 1 = “terrible”, 2 = “unhappy”, 3 = “mostly dissatisfied”, 4 = “mixed, about equally satisfied and dissatisfied”, 5 = “mostly satisfied”, 6 = “pleased”, 7 = “delighted” (Lehman, 1988) and will be the questions used in the present study.

2.2.3.2 Life Functioning Questionnaire (LFQ)

The LFQ ($\alpha = .87$) is a 14-item self-report measure that assesses quality of life across four domains including leisure activities with friends and family and responsibilities at work, home, school or day center (Altshuler et al., 2002).

2.2.3.3 Quality of Life Enjoyment and Satisfaction Questionnaire Short Form (Q – LES – Q-SF).

The Q-LES-Q-SF is a 18-item measure with eight domains, including physical health, subjective feelings, leisure time activities, social relationships, and general activities, including school, work, and housework, based on single items each (Swan et al., 2009). The Q-LES-Q-SF response scale ranges from 1 to 5 (“not at all or never” to “frequently or all the time”; Ritsner et al., 2005). Cronbach’s alpha in the present study was excellent ($\alpha = .92$).
2.2.4 Comparison Measures of Functional Impairment

2.2.4.1 Longitudinal Interval Follow-up Evaluation – Range of Impaired Functioning Tool (LIFE-RIFT)

The LIFE-RIFT consists of 9 questions, where three questions each are designated for a summed work score and interpersonal relations score and one question each for the satisfaction and recreation subscales (Leon et al., 1999). The response scale includes six options (1 = “not applicable”, 2 = “no impairment”, 3 = “mild impairment”, 4 = “moderate impairment”, 5 = “severe impairment”, and 6 = “no information”; Leon, et al., 1999). Cronbach’s alpha in the present study was excellent (α = .82).

2.2.4.2 Medical Outcomes Study scale (SF-36)

SF-36 is a 36-item self-report measure with two domains (mental health and physical health) and eight subscales including vitality (α = .75), bodily pain (α = .87), role-physical (α = .94), and physical health (α = .96), role-emotional (α = .91), social functioning (α = .62), mental health (α = .83), and general health (α = .79; Ware & Sherbourne, 1992). The response scale depends on the question. For example, question one responses ranged from “poor” to “excellent”, question two ranged from “much worse than one year ago” to “much better now than one year ago”, question three ranged from “yes, limited a lot” to “not limited at all”, and questions four and five were “yes”/“no” (Ware & Sherbourne, 1992). Question nine ranges from “none of the time” to “all the time”, question ten ranges from “none of the time” to “all the time” but includes different options than question nine, and question eleven ranges from “definitely false” to “definitely true” (Ware & Sherbourne, 1992).
2.2.4 Measures for Concurrent, Predictive, & Incremental Validity

2.2.4.1 The Beck Depression Inventory – II (BDI-II)

The BDI-II (Beck, Steer, Ball, & Ranieri, 1996) is a 21-item measure of depressive symptoms and has shown excellent internal consistency ($\alpha = .91$; Beck et al., 1996). The BDI-II is frequently used to assess depression symptoms in both research and clinical settings. The BDI-II is included to increase the probability of having a large enough sample of college students experiencing psychopathology symptoms to examine concurrent and predictive validity of QOLaFI. In the present study, internal consistency was excellent ($\alpha = .95$).

2.2.4.2 The Beck Anxiety Inventory (BAI)

The BAI (Beck, Epstein, Brown, & Steer, 1988) is a 21-item measure of anxiety symptoms (Beck & Steer, 1993). The BAI had excellent internal consistency reliability ($\alpha = .94$). Anxiety is one of the more common mental health symptoms reported in college-age samples (Vázquez et al., 2011). Anxiety symptomatology is included to increase the likelihood of having a large enough sample of individuals experiencing psychopathology to examine concurrent and predictive validity of QOLaFI.

2.2.6 Measure of Discriminant Validity

2.2.6.1 Marlowe-Crowne Social Desirability Scale (MC-SDS).

The MC-SDS is a 20-item measure of faking good and has a “true/false” response scale (Strahan & Gerbasi, 1972). The MC-SDS has shown an internal consistency of .88 and has been compared to a quality of life measure to examine discriminant validity (Hubley, Russell, & Palepu, 2005). In the present study, internal consistency was adequate ($\alpha = .75$).
2.3 Procedures

A convenience sample of participants from undergraduate psychology courses at the University of Toledo were recruited to participate in the two-part online survey. Individuals who signed up on Sona Systems were provided a web link to Psychdata (Locke & Keiser-Clark, 2001), an online data collection software package. Those in advanced psychology courses were provided a link to the survey via e-mail. Within Psychdata (Locke & Keiser-Clark, 2001), individuals were provided an informed consent and were allowed to e-mail the researcher to ask questions. When ready, they electronically signed the consent form. Once consent was given, a new window opened with a composite survey of the questionnaires being included in part one of the study. The part 1 survey took approximately forty-five minutes to complete and included all of the measures listed in the measures section. On the last screen of the questionnaires, participants were able to download an educational handout with information on depression and anxiety that included contact information for the campus Counseling Center and the Psychology Clinic. Participants who completed the first part of the study were given one research credit and asked to participate in part 2 of the study two weeks after completing part 1. Participants were given the link to part 2 via an e-mail prompt. Those who clicked on the link in their e-mail participated in a Psychdata composite survey that took approximately 20 minutes to complete and included only the QOLaFI, BDI-II, and BAI measures. Participants who completed part two were granted half of a research credit.
2.4 Participant Characteristics

Three hundred and ninety-nine undergraduate students at the University of Toledo (65% in General Psychology) agreed to participate in this study. Of the 399 who agreed to participate, 389 individuals’ data were retained. One participant declined to redo the survey after a computer malfunction, and nine participants’ data were removed from analyses due to more than 10% missing data for every questionnaire given. Demographic information points to the heterogeneity of the sample (with the exception of sexuality). Specifically, 184 (47%) identified themselves a Freshman, 107 (28%) as Sophomores, 48 (12%) as Juniors, and 50 (13%) as Seniors. The mean age of the sample was 20 years old (range 17 to 51 years old), 33% male, 92% heterosexual. The mean household income of the sample was $80,000 - $90,000 (SD = $60,000). 50 (13%) identified as African/African American, 08 (2%) as Asian/Asian American, 36 (9%) as South American, 20 (5%) as Central American, 17 (4%) as Mexican/Mexican-American, 08 (2%) as being from Middle Eastern descent, 133 (35%) as from European descent, 12 (3%) as from mixed ancestry, and 105 (27%) identified as something other than one of the racial/ethnic categories listed. Regarding religious affiliation, 124 (32%) identified as Muslim, 125 (32%) identified as Catholic, 37 (10%) identified as Jewish, 27 (6%) identified as Atheist, 19 (5%) identified as Agnostic, 7 (2%) identified as Protestant/Other Christian, and 50 (13%) identified as something other than one of the categories listed.

During the first semester of data collection, 42 participants were not given the opportunity to participate in Part 2 because of the lapsed time needed between Part 1 and
Part 2. Substantially more participants were needed for Part 1, and so the researcher allowed participants to participate in Part 1 right up to the end of the semester. These individuals were informed during the recruitment phase that they would not be able to participate in Part 2 of the study. Two hundred and nineteen participants participated in Part 2 (55%). Nine participants participated twice in Part 2, and so their duplicated data were removed from analyses. Further, 3 participants who participated in Part 2 were unable to be matched to Part 1 data, and an additional 25 participants were excluded from analyses because the days between Part 1 and Part 2 were longer than 3 weeks. Thus, the final total of participants included in analyses comparing Part 1 to Part 2 data was 182.
Chapter 3

Results

3.1 Statistical Analysis Plan

3.1.1 Validity

Bivariate Pearson correlations were run to examine the validity of the QOL and FI scales of QOLaFI. Good convergent, concurrent, predictive, and incremental validity was established when correlations for a given test were 0.5 or greater. Good discriminant validity was established when correlations were less than 0.1. Convergent validity was assessed comparing the QOL scale from QOLaFI to the QOLI, Q-LES-Q-SF, and LFQ. The LIFE-RIFT and SF-36 were used to examine convergent validity of FI. Further, convergent validity was assessed by examining the item factor loadings of the subscales of QOL and FI, wherein good convergent validity was established when item loadings were greater than 0.7. The BDI-II and BAI were used to examine concurrent and predictive validity of QOL and FI. Specifically, concurrent validity was assessed by evaluating the strength of the relationship between the QOL scale and the BAI and BDI-II all taken during Part 1 of data collection. Predictive validity was assessed by correlating the QOL and FI data collected at Part 1 with the BDI-II and BAI taken at Part 2. Discriminant validity was assessed in three ways. First, the correlation between the FI
scale and QOL scale were compared. Second, the MC-SDS was correlated with the QOL and FI scales. Third, the item factor loadings were assessed wherein good discriminant validity is established when all item loadings are below 0.9. Finally, incremental validity was assessed using Fisher’s Zr. As outlined in Meng, Rosenthal, and Rubin (1992), where the correlation coefficient of the validated quality of life measures with the BAI and BDI-II taken at Part 1 were compared to the correlation coefficient of the QOL scale with the BAI and BDI-II taken at Part 1. Additionally, Fisher’s Zr was used to examine incremental validity of the FI scale over other measures of functional impairment in the same fashion as just described for QOL.

3.1.2 Factor Structure & Model Fit

Specification. A five-factor model of QOL (see Figure 3-1) and a five-factor model of FI (See Figure 3-2) were specified where factors were allowed to covary in each model based on previous research that has established domains of QOL and FI (e.g., QOLI, Lehman,1988; LIFE-RIFT, Leon et al., 1999). Specifically, the five QOL factors include social relationships, work/school, leisure activities, physical health, and living environment. The five factors of FI include social relationship functioning, work/school functioning, cognitive functioning, leisure activities, and autonomy. Factors were fixed to a constant of 1 in order to standardize the factors and free the factor loadings for estimation. Data were all continuous and unidimensional.
Figure 3-1. Model of Quality of Life Scale of QOLaFI.
Figure 3-2. Model of Functional Impairment Scale of QOLaFI
Identification. Both QOL and FI models were scaled using UVI (Unit Variance Identification) constraint where factors were set to equal a constant of 1. The QOL model’s $df = 1117$, while the FI model’s $df = 1081$. The five-factor models were both over-identified.

Estimation. Two confirmatory factor analyses using Maximum Likelihood estimation were run using Mplus v.7. The residual correlations were examined to assess the assumption of local independence, which refers to the probability of responses being exclusively related only to the latent construct (i.e., either quality of life or functional impairment; Hays et al., 2000). Fit indices were used to evaluate the goodness of fit that the models have on the data. There are currently no strict standards for evaluating the fit indices, however several conventional guidelines have been proposed to suggest an adequate fit if (a) Chi-square goodness of fit test ($\chi^2$) is not significant, (b) Root Mean-Square Error of Approximation (RMSEA; Steiger & Lind, 1980) is .10 or less, and (c) Tucker-Lewis Fit Index (TLI; Tucker & Lewis, 1973) and Comparative Fit Index (CFI; Bentler, 1990) is .90 or greater (MacCallum, Browne, & Sugawara, 1996). Hu and Bentler (1999) provided guidelines to establish a good fit of the model, including the CFI and TLI (> .95), and RMSEA (< .06). Thus, the CFAs for QOL and FI were evaluated based on those standards with the exception of the $\chi^2$ statistic. $\chi^2$ is dependent on sample size, wherein with large sample sizes, $\chi^2$ is frequently significant with even inconsequential discrepancies (Bentler & Bonett, 1980; Jöreskog and Sörbom, 1993). Given the large sample size, discussed next, it is likely that $\chi^2$ will be significant and should not be solely relied on to determine model fit.
3.2 Comparison of Part 1 and Part 2 Participant Characteristics

Chi-square analyses were ran comparing demographics of those who participated in only Part 1 with those who participated in both Part 1 and Part 2. Results indicated that there were no significant differences between those who participated in Part 1 only and those who participated in both Part 1 and Part 2. A visual representation of the differences across demographics can be found in Table 1.1 below.
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<th>Participated in Part 1 &amp; 2 (N = 210)</th>
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<td>Heterosexual N (%)</td>
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<td>195 (93%)</td>
</tr>
<tr>
<td>Bisexual N (%)</td>
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<td>Homosexual N (%)</td>
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<td>3 (1%)</td>
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<tr>
<td>Preferred Not to Say N (%)</td>
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<td>6 (3%)</td>
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<td>8 (4%)</td>
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<td>0 (0%)</td>
</tr>
<tr>
<td>Other</td>
<td>28 (15%)</td>
<td>31 (15%)</td>
</tr>
</tbody>
</table>
3.3 Missing Data

Missing data were handled using maximum likelihood estimation. This was selected as one of the best ways to handle missing data because it provides unbiased standard error estimates while reducing the number of Type II errors and underestimated correlations and beta weights (Kline, 2011). Missing data on the QOLaFI were determined to be missing completely at random, according to Little’s missing complete at random test (MCAR $\chi^2 = 7002.25$, $df = 7105$, $p = .805$).

3.4 Power

Once the QOLaFI measure was developed and before data collection began, a power analysis based on MacCallum, Browne, and Sugawara’s (1996) procedures was completed to determine the exact sample size needed in order to detect large effects in the CFAs. Previous research was used to determine the desired effect size (e.g., Guadagnoli & Velicer, 1988; Gagne & Hancock, 2006). First, Guadagnoli and Velicer (1988) and Gagné and Hancock (2006) both found that power depended more on the number of factors and the quality of the factor loadings and less on large sample size, in which they found four or more loadings of 0.6 had enough power to have factors converge on a good model. Second, MacCallum, Widaman, Zhang, and Hong (1999) found that with four loadings at 0.6, a sample size of 150 subjects was sufficient for adequate power. Therefore a sample size of 400 was adequate for the number of factors expected and the volume of questions included, and allowed room for poorer quality questions.
A post-hoc power analysis using G*Power (Erdfelder, Faul, & Buchner, 1996) was completed to examine the power achieved for the correlative analyses completed in this study. Power for each of the tests was 1.00. Because the undergraduate population at the University of Toledo is unreliable in predicting attrition, having a large initial sample size helped account for the scenario of a very high attrition rate in Part 2.

3.5 Assessing Assumptions and Normality

IBM SPSS v.19 was used to assess normality, assumptions, and correlative analyses, while MPlus v.7 was used to run two confirmatory factor analyses. A box plot of the data and Mahalanobis distance was examined for potential problems with normality. Additionally, an examination of the skewness and kurtosis of the measures by examining the Shapiro-Wilk test of normality was completed. Results revealed that the Q-LES-Q-SF, LFQ, LIFERIFT, SF-36, BAI, and BDI were not normally distributed, see Table 2.1 for the means and SDs of the measures. The QOLI met the Shapiro-Wilk test and therefore did not violate the assumption of normality. The BAI had a mean below what was found in the normed sample of college students ($M = 11.08, SD = 9.10$), indicating that the current sample may have underreported anxiety symptoms or is less anxious than other college students are. The BDI-II mean was similar to the mean found in the normed college sample; however, the variability in the scores was small.

<table>
<thead>
<tr>
<th>Table 2.1: Means and Standard Deviations of Measures.</th>
</tr>
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<tbody>
<tr>
<td>QOL</td>
</tr>
<tr>
<td>Mean</td>
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<tr>
<td>SD</td>
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</table>

Note. N = 389.
Results from these tests revealed no univariate, and three multivariate outliers on the QOLaFI. However, a closer examination of the three outliers (one outlier on the QOL scale and two on the FI scale) revealed that the individuals were reporting scores consistently (e.g., very low level of QOL with elevated BDI scores, which is what we would expect to see), but the scores were two standard deviations below the mean for the sample. No data were removed on any of the scales since ML has been shown to be a robust test despite the inclusion of outliers (Yuan & Zhong, 2013). To test the assumption of monotonicity the mean scores for each response option was compared to the total mean scores. There were no problems with monotonicity on any of the scales. Inspections of the VIF and tolerance for each subscale on QOL and FI scales of QOLaFI were completed to look for multicollinearity. Results indicate that VIF levels were less than three, and tolerance levels were greater than 0.10, indicating no multicollinearity concerns. To test the assumption of unidimensionality, Cronbach alpha levels were assessed for each scale. There were no problems with unidimensionality on any of the scales. To assess the linearity assumption, scatterplots of each subscale of the two scales were plotted, which indicated no concerns with linearity. Homoscedasticity was assessed by plotting scatterplots of the QOL and FI subscales with their residuals. No concerns with homoscedasticity were detected.
3.6 Reliability

*Internal Consistency Reliability.* Internal consistency was assessed using Cronbach’s alpha. Results for the subscales of QOLaFI can be found in Table 2.2. As can be seen from the table, all of the subscales of QOLaFI demonstrated excellent internal consistency.

| Table 2.2: Internal consistency of the subscales of QOLaFI. |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| QOLSR | QOLWS | QOLLA | QOLPH | QOLLE | FISR | FIWS | FILA | FIAU | FICF |
| Alpha | .87 | .85 | .86 | .80 | .78 | .80 | .90 | .92 | .80 | .90 |
| # Items | 15 | 10 | 8 | 10 | 6 | 8 | 7 | 9 | 8 | 15 |

Note. N = 389.

*Test-Retest Reliability.* Test-retest reliability was examined using Bivariate Pearson Correlations over a 3-week period. Specifically, results compare the QOL scale from Part 1 of QOLaFI to the QOL scale from Part 2 of QOLaFI and the FI scale from Part 1 of QOLaFI to the FI scale from Part 2 of QOLaFI. Both the QOL scale \( r = .755, \ p < .001 \) and FI scale \( r = .738, \ p < .001 \) showed excellent test-retest reliability.

3.7 Subscale Correlations of QOL scale

Results of the subscale correlations can be found in Table 3.1. As can be seen, the correlations are moderate, with no correlations greater than 0.7. Given that the measure is inherently designed to tap into life domains that may not share the same level of satisfaction and may differentially affect an individual’s overall quality of life, the convergent validity is excellent.
Quality of Life Scale Item Correlations

QOLaFI’s item correlations were examined and results are found in Tables 04-08. Specific details about the item-level correlations will be discussed in the following paragraphs. The sections are organized by scale (QOL first) then by subscales, where problematic items are described.

**Social Relationships Subscale.** Results can be seen in Table 04. With the exception of two items on the social relationships subscale of the QOL scale, the intercorrelations were statistically significant, and ranged from small to medium. Specifically, the correlation between item 10 (“My romantic relationships”) and items 06 (“How well my friends treated me”) and 08 (“How close I felt to my family”) were very small and nonsignificant. Further, the remainder of the correlations between item 10 and the other variables were small; suggesting that item 10 is not related to the rest of the items on the social relationships scale. Similarly, item 15 (“My ability to help others when they needed me”) shares only a small relationship with the other items. Thus, by
removing items 10 and 15, which did not appear to fit on the Social Relationships subscale, the subscale should improve. Further, items 08, 09 (“The amount of time I spent with my family”), 12 (“My interactions with my family”), and 14 (“My love life”) are correlated moderately with one another, but share small correlations with the rest of the items on the scale. This indicates that Social Relationships could be parsed into two subscales, where family and romantic relationships are on a subscale and friendships are on another. Many people consider friendships to be less intimate than family and romantic relationships, so it makes sense that they would not all fit on the same subscale.

Table 4.1: QOLaFI Quality of Life Scale – Social Relationships Subscale.

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<td>.26***</td>
<td>.20***</td>
<td>.20***</td>
<td>.20***</td>
<td>.32***</td>
<td>.23***</td>
<td>.26***</td>
</tr>
</tbody>
</table>

Notes. N = 389. *** p < .001. ** p < .01. * p < .05. All correlations are 2-tailed.
Work/School Subscale. Results can be found in Table 5.1. Items 01 and 02 were very highly correlated, suggesting that they are very similar, and perhaps are redundant. Comparing the two item correlations to the other eight items on the scale, item 01 seems to be least related to the other items. Thus, removing redundant item 01 could improve the subscale. Items 04 (“The level of income I earn”) and 05 (“The amount of hours I am working”) were also very highly correlated, but were unrelated to item 10 (“The level of income I can expect to make in my field”). It was found that satisfaction with level of income earned and amount of hours currently working were not related to the level of income an individual can expect to make in their field. This is likely due to the current sample being comprised of students, thus the items should be retained on the Work/School subscale.

Table 5.1: QOLaFI Quality of Life Scale – Work/School Subscale.

<table>
<thead>
<tr>
<th></th>
<th>WS01</th>
<th>WS02</th>
<th>WS03</th>
<th>WS04</th>
<th>WS05</th>
<th>WS06</th>
<th>WS07</th>
<th>WS08</th>
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<td>.504***</td>
<td>.234***</td>
<td>.265***</td>
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<td>.264***</td>
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<td>.491***</td>
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<tr>
<td>WS10</td>
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<td>.278***</td>
<td>.349***</td>
<td>.152***</td>
<td>.127***</td>
<td>.327***</td>
<td>.295***</td>
<td>.336***</td>
<td>.393***</td>
</tr>
</tbody>
</table>

Notes. N = 389. *** p < .001. ** p < .01. * p < .05. All correlations are 2-tailed.
Leisure Activities Subscale. Results are reported in Table 6.1. Two notable patterns occur on this scale. First, items 01 (“How I get to spend my free time”) and 02 (“The level of enjoyment I have when I am doing leisure activities”) are moderately correlated, and it appears that item 02 provides the more unique contribution to the scale. Second, item 06 (“Relaxing by myself”) is moderately correlated with item 08 (“Spending time alone watching TV, reading a book, or magazine, or surfing the internet”), where 08 provides the more unique contribution. Therefore, removing items 01 and 06 on this subscale could improve the subscale.

Table 6.1: QOLaFI Quality of Life Scale – Leisure Activities Subscale.

<table>
<thead>
<tr>
<th></th>
<th>LA01</th>
<th>LA02</th>
<th>LA03</th>
<th>LA04</th>
<th>LA05</th>
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<td>.507***</td>
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<td></td>
</tr>
<tr>
<td>LA05</td>
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<td>.336***</td>
<td>.485***</td>
<td>.552***</td>
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<td></td>
</tr>
<tr>
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<td>.431***</td>
<td>.292***</td>
<td>.380***</td>
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<tr>
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<td>.258***</td>
<td>.365***</td>
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<td>.427***</td>
</tr>
</tbody>
</table>

Notes. N = 389. *** p < .001. ** p < .01. * p < .05. All correlations are 2-tailed.

Physical Health Subscale. Results can be found in Table 7.1. Items 02 (“The quality of my sleep”) and 03 (“The number of hours of sleep I get”) were very strongly correlated, and both were similar in their correlations with other items on the scale. Additionally, items 07 (“My sex drive”) and 08 (“My ability to perform sexually”) were strongly correlated, and both were similarly moderately related to the same item (e.g., 06 “How often I engage in sexual activities”) and shared a very small correlation with the
other items on the scale. Items 09 and 10 are not strongly related to any of the items on
the scale and should be removed to improve the subscale. Removing items 06, 07, and
08 on this subscale would improve the Physical Health subscale. Results suggest that sex
is not associated with physical health. It is possible that satisfaction with sex is assessed
when evaluating one’s romantic relationship even though being physically healthy in
order to perform sexually is implicit.

<table>
<thead>
<tr>
<th>Table 7.1: QOLaFI Quality of Life Scale – Physical Health Subscale.</th>
</tr>
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<tbody>
<tr>
<td></td>
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<tr>
<td>PH01</td>
</tr>
<tr>
<td>PH02</td>
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<td>PH06</td>
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<td>PH08</td>
</tr>
<tr>
<td>PH09</td>
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<tr>
<td>PH10</td>
</tr>
</tbody>
</table>

Notes. N = 389. *** p < .001. ** p < .01. * p < .05. All correlations are 2-tailed.

*Living Environment Subscale.* Results can be seen in Table 8.1. Overall, this
scale contains items that seem to measure unique aspects of the living environment.
Items 04 (“The neighborhood I live in”) and 05 (“The house or apartment I live in”) are
strongly correlated, and both are similarly related to the other items on the scale.
Table 8.1: QOLaFI Quality of Life Scale – Living Environment Subscale.

<table>
<thead>
<tr>
<th></th>
<th>LE01</th>
<th>LE02</th>
<th>LE03</th>
<th>LE04</th>
<th>LE05</th>
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<tr>
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<tr>
<td>LE05</td>
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<td>.307***</td>
<td>.409***</td>
</tr>
</tbody>
</table>

Notes. N = 389. *** p < .001. ** p < .01. * p < .05. All correlations are 2-tailed.

3.9 Validity of the QOL scale of QOLaFI

Convergent Validity. Results are found in Table 8.2. The LFQ is negatively correlated with the Q-LES-Q-SF, QOLI, and QOLaFI because on the LFQ, higher scores indicate poorer quality of life. The QOL scale is moderately correlated with the other measures of quality of life.

Table 9.1: Convergent validity of the QOL scale of QOLaFI.

<table>
<thead>
<tr>
<th></th>
<th>QOL</th>
<th>QOLI</th>
<th>LFQ</th>
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</thead>
<tbody>
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<td></td>
<td></td>
</tr>
<tr>
<td>QOLI</td>
<td>.510***</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>LFQ</td>
<td>-.406***</td>
<td>-.407***</td>
<td>1</td>
</tr>
<tr>
<td>Q-LES-Q-SF^</td>
<td>.677***</td>
<td>.651***</td>
<td>-.520***</td>
</tr>
</tbody>
</table>


Concurrent Validity. QOL was correlated negatively with the BDI-II (r = - .308***, p < .001) and BAI (r = -.115*, p < .05), indicating that as quality of life improves depression and anxiety symptoms decrease. These findings were in the hypothesized direction and the small correlations provide evidence to suggest that the
construct of quality of life is capturing unique information. Further, the QOL and FI scales from QOLaFI only moderately correlated with one another ($r = .80, p < .001$). This finding supports the hypothesis that functioning and quality of life are related constructs, but they capture unique information.

**Discriminant Validity.** Discriminant validity was assessed in two ways. First, the correlation between the FI scale and QOL scale were compared, results indicated a strong correlation ($r = .80; p < .001$). Second, the relationship between the QOL scale and the MC-SDS were compared, and results indicated that the two constructs were not correlated ($r = .017; p = .744$).

**Predictive Validity.** The QOL scale showed a medium association with the BDI-II ($r = -.235, p < .01$) and BAI ($r = -.339, p < .001$) at Part 2, indicating that the QOL scale of QOLaFI is sensitive to anxiety and depression symptom severity.

**Incremental Validity.** Results can be found in Table 10.1. As can be seen, the QOL scale demonstrates marginal incremental validity over the QOLI and LFQ, and demonstrates good incremental validity over the Q-LES-Q-SF when assessing the relationship to the BDI-II. When comparing the relationship of the validated measures with the BAI, QOL showed good incremental validity over the QOLI, but did not demonstrate incremental validity over the Q-LES-Q-SF and LFQ.

<table>
<thead>
<tr>
<th>Table 10.1: Incremental validity of QOL.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation with:</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>QOLI</td>
</tr>
<tr>
<td>QLESQSF</td>
</tr>
<tr>
<td>LFQ</td>
</tr>
</tbody>
</table>

Note. $N = 389$. $^{***} p < .001$. $^{^*} p = .06$ Tests are 1-tailed.
3.10  Factor Structure of QOL scale

CFA indicated a poor fit for 5-factor model, $\chi^2 = 4515.62$, $df = 1117$, $p < .001$; CFI = .60; TLI = .58; RMSEA = .088. A closer look at the factor loadings indicated items could be taken out that might improve the model fit. Specifically, on the Social Relationships subscale, items 08, 09, 11, 12, 13, 14, and 15 all had factor loadings below .6. On the Work/School subscale, items 04, 05, and 10 had loadings below .6. On the Physical Health subscale, items 06, 07, 08, 09, and 10 all had loadings below .6. Finally, on the Living Environment subscale, items 04, 05, and 06 had factor loadings below .6.

3.11  QOL Item Factor Loadings

Factor loadings of QOL Social Relationships subscale. The factor loadings were examined for the individual items on the subscales of the QOL scale. Results can be found in Table 11.1. As can be seen, six items loaded well (factor loading above .7) onto the Social Relationships subscale of the QOL scale. These six items demonstrate good convergent validity. Further, no items had loadings greater than .90, which indicates good divergent validity.

Factor loadings of the QOL Work/School subscale. Results can be found in Table 11.1. Four items had loadings at .7 or greater. Those items demonstrated excellent convergent validity. No items had factor loadings greater than .9, demonstrating good divergent validity.

Factor loadings of the QOL Leisure Activities subscale. Results can be found in Table 11.1. Three items had factor loadings at .7 or greater, though all items loaded at .6 and greater, which demonstrated adequate convergent validity. Again, no items had factor loadings greater than .9, which indicated excellent divergent validity.
Factor loadings of the QOL Physical Health subscale. Results are displayed in Table 11.1. Five items had factor loadings of greater than .6 with three of those items with factor loadings of .7 and higher. No loadings were greater than .9, indicating good divergent validity.

Factor loadings of the QOL Living Environment subscale. Results are display in Table 11.1. All the factor loadings were greater than .5, two were greater than .6, and three were greater than or equal to .7. None of the loadings was above .9, indicating good divergent validity.

<table>
<thead>
<tr>
<th>Table 11.1: QOLaFI Quality of Life Scale – Item Factor Loadings.</th>
</tr>
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<tbody>
<tr>
<td>Social Relationships</td>
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<td>----------------------</td>
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<tr>
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<td>SR13</td>
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<tr>
<td>SR14</td>
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<td>SR15</td>
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</table>

Notes. N = 389. All ps < .001.
3.12 QOL Subscale Factor Loadings

The subscale level factor loadings were also examined. Results are displayed in Table 12.1. As can be seen, the QOL subscale factor loadings loaded moderately, with none of the scales loading below .5.

<table>
<thead>
<tr>
<th>QOLWS</th>
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<th>QOLLE</th>
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<tr>
<td>QOLPH</td>
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</tbody>
</table>


3.13 Subscale Correlations of the FI scale

Subscale correlations were also examined. Results can be found in Table 13.1. As can be seen, the subscale correlations are mostly moderate. This was expected given that the measure is inherently designed to tap into life domains that may not share the same level of functioning and may differentially affect an individual’s overall functional impairment. Additionally, it was expected that the correlation between work/school functioning and cognitive functioning would be stronger than the other correlations because cognitive functioning greatly affects an individual’s ability to function at school/work. Overall, the convergent validity for FI is good.
### Table 13.1 QOLaFI Functional Impairment Scale – Subscale Correlations.

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<td>.571***</td>
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</table>

Notes. N = 389. *** p < .001. All correlations are 2-tailed.

### 3.14 Functional Impairment Scale Item Correlations

In the following paragraphs, FI subscale item correlations are discussed. The FI subscale item correlations fared better than the QOL subscale items, even though there were some problematic items.

**Social Relationships Subscale.** Results are reported in Table 14.1. Items share a small to moderate relationship, which indicates that the items on this scale are all contributing uniquely to social relationship functioning.

### Table 14.1: QOLaFI Functional Impairment Scale – Social Relationships Subscale.

<table>
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<td>.296***</td>
<td>.595***</td>
</tr>
</tbody>
</table>

Notes. N = 389. *** p < .001. All correlations are 2-tailed.
**Work/School Subscale.** Results are reported in Table 15.1. Items 01 (“To complete tasks related to work and/or school”), 02 (“To manage my time at work and/or school”), 03 (“To exert myself while at work and/or school”), and 04 (“To engage in learning new skills”) are moderately correlated, where item 03 seems to provide the most unique contribution to the scale.

<table>
<thead>
<tr>
<th></th>
<th>WS01</th>
<th>WS02</th>
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<th>WS04</th>
<th>WS05</th>
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</table>

Notes. N = 389. *** p < .001. All correlations are 2-tailed.

**Leisure Activities Subscale.** Results can be seen in Table 16.1. Items 02 (“Find pleasure in my leisure activities”), 03 (“Look forward to my leisure activities”), and 04 (“Have at least one leisure activity that I participated in every week”) are strongly correlated, where item 03 appears to have the least overlap with other items. Additionally, items 07 (“Participate in leisure activities with other people”) and 08 (“Plan for leisure activities”) are also strongly correlated, where item 07 has the lesser overlap with other items.
Table 16.1: QOLaFI Functional Impairment Scale – Leisure Activities Subscale.

<table>
<thead>
<tr>
<th></th>
<th>LA01</th>
<th>LA02</th>
<th>LA03</th>
<th>LA04</th>
<th>LA05</th>
<th>LA06</th>
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<th>LA08</th>
</tr>
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<tr>
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<tr>
<td>LA05</td>
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<td>.666***</td>
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<td>.585***</td>
<td>.487***</td>
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<td>.655***</td>
</tr>
</tbody>
</table>

Notes. N = 389. *** p < .001. ** p < .01. * p < .05. All correlations are 2-tailed.

**Autonomy Subscale.** Results can be observed in Table 17.1. The intercorrelations for this scale are generally good, where all items are contributing uniquely to the scale. Items 01 (“Complete errands [like grocery shopping, servicing your vehicle]”) and 02 (“Schedule and keep appointments [like doctor’s visits, meetings at work]”) are moderately, but seem to contribute uniquely to the scale.

Table 17.1: QOLaFI Functional Impairment Scale – Autonomy Subscale.

<table>
<thead>
<tr>
<th></th>
<th>AU01</th>
<th>AU02</th>
<th>AU03</th>
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<tr>
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<td>.388***</td>
<td>.281***</td>
<td>.224***</td>
<td>.340***</td>
<td>.310***</td>
<td>.469***</td>
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</table>
Living Environment Subscale. Results are reported in Table 18.1. Items on this scale all seem to be contributing unique information to the overall scale. Items 10 (“Adapt my mood to the mood of those surrounding me”) and 11 (“Evaluate my behaviors so that they fit the situation”) are pretty strongly correlated, though both are providing unique contributions otherwise.

Table 18.1: QOLaFI Functional Impairment Scale – Cognitive Functioning Subscale.

<table>
<thead>
<tr>
<th></th>
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<th>CF04</th>
<th>CF05</th>
<th>CF06</th>
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<th>CF09</th>
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<tr>
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</tr>
</tbody>
</table>

Notes. N = 389. *** p < .001. ** p < .01. * p < .05. All correlations are 2-tailed.
3.15 Validity of the FI Scale of QOLaFI

Convergent Validity. As can be observed in Table 19.1, the FI scale from QOLaFI shares a negative correlation with the LIFE-RIFT and SF-36 because the FI scale is scored such that higher scores indicate better functioning, while the LIFE-RIFT and SF-36 is scored where higher scores indicate worse functioning. Correlations are small.

<table>
<thead>
<tr>
<th>Table 19.1: Convergent validity of the FI scale of QOLaFI.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FI</td>
</tr>
<tr>
<td>----</td>
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<tr>
<td>FI</td>
</tr>
<tr>
<td>LIFE-RIFT</td>
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<tr>
<td>SF-36 Health Transition</td>
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<td>SF-36 Mental Health</td>
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<tr>
<td>SF-36 Role Emotional</td>
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<td>SF-36 Social Functioning</td>
</tr>
<tr>
<td>SF-36 Vitality</td>
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<td>SF-36 General Health</td>
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<td>SF-36 Role Physical</td>
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<td>SF-36 Physical Functioning</td>
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</tbody>
</table>

Note. N = 389. *** p < .001. ** p < .01. * p < .05. 2-tailed.

Concurrent Validity. The FI scale did not show concurrent validity with the BAI (r = .02, p = .708), but did demonstrate concurrent validity with the BDI-II (r = -.28, p < .001). There does appear to be a problem with the BAI because it was not found to be related to the BDI-II (r = -.014, p = .787). This finding is atypical of what has been found in previous research using the BAI and BDI-II.
Discriminant Validity. Results were previously reported regarding the relationship between FI and QOL, therefore here, results focus on the correlation between FI and MC-SDS. As expected, the FI scale and MC-SDS were not correlated ($r = .013, p = .796$).

Predictive Validity. The FI scale showed adequate predictive validity with both the BDI-II ($r = -.252, p < .001$) and BAI ($r = -.339, p < .001$) administered at Part 2. Thus, results indicate that the FI is sensitive to anxiety and depressive symptom severity.

Incremental Validity. Results can be found in Table 20. As can be seen, comparing the correlations between the BAI and the SF36 subscales to the correlation between the BAI and FI, the FI did not demonstrate incremental validity. The FI scale showed incremental validity with regard to the BDI-II compared to the SF-36 Social Functioning subscale, Mental Health subscale, Vitality subscale, Physical Health subscale, and Role Physical subscale. The FI scale (with the BDI-II) was marginally incrementally valid over the SF-36 Bodily Pain subscale. Finally, the FI scale also showed incremental validity over the LIFE-RIFT when comparing correlations with the BDI-II, but did not show incremental validity over the LIFE-RIFT when comparing the correlation with the BAI.
Table 20.1: Incremental validity of FI.

<table>
<thead>
<tr>
<th>Correlation with</th>
<th>BAI</th>
<th>BDI-II</th>
</tr>
</thead>
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<tr>
<td>LIFE-RIFT</td>
<td>Fisher’s $Zr = -0.88, p = .19$</td>
<td>Fisher’s $Zr = -14.67^{***}$</td>
</tr>
<tr>
<td>SF-36RP</td>
<td>Fisher’s $Zr = -0.13, p = .45$</td>
<td>Fisher’s $Zr = -1.83^*$</td>
</tr>
<tr>
<td>SF-36BP</td>
<td>Fisher’s $Zr = -1.06, p = .15$</td>
<td>Fisher’s $Zr = -1.41^*$</td>
</tr>
<tr>
<td>SF-36GH</td>
<td>Fisher’s $Zr = -1.06, p = .15$</td>
<td>Fisher’s $Zr = -0.36, p = .36$</td>
</tr>
<tr>
<td>SF-36SF</td>
<td>Fisher’s $Zr = -1.06, p = .15$</td>
<td>Fisher’s $Zr = -9.17^{***}$</td>
</tr>
<tr>
<td>SF-36RE</td>
<td>Fisher’s $Zr = -1.42^*$</td>
<td>Fisher’s $Zr = 0.17, p = .43$</td>
</tr>
<tr>
<td>SF-36MH</td>
<td>Fisher’s $Zr = -1.06, p = .15$</td>
<td>Fisher’s $Zr = -10.23^{***}$</td>
</tr>
<tr>
<td>SF-36PH</td>
<td>Fisher’s $Zr = -0.5, p = .31$</td>
<td>Fisher’s $Zr = -3.08^{***}$</td>
</tr>
<tr>
<td>SF-36V</td>
<td>Fisher’s $Zr = -1.06, p = .15$</td>
<td>Fisher’s $Zr = -9.04^{***}$</td>
</tr>
</tbody>
</table>

Note. $N = 389$. $^{***} p < .001$. $^* p < .05$. $^* p = .08$ Tests are 1-tailed.

### 3.16 Factor Structure of FI scale

The CFA indicated an adequate fit for the data, $\chi^2 = 3314.86, df = 1024, p < .001$; CFI = .80; TLI = .80; and RMSEA = .06. Results from the RMSEA indicate a good model fit for the FI scale of QOLaFI, while other fit indices show that the model fit the data adequately. Closer examination of the factor loadings of the subscales indicates where items can be removed from the scale to shorten the length of the measure, and potentially improve model fit. Specifically, the Social Relationships subscale items 02, 04, and 06 all have item loadings of less than .6. On the Autonomy subscale items 02, 03, 04, 05, 06 and 08. Additionally, on the Cognitive Functioning subscale, items 05, 06, 07, 12, 13, and 14 all have item loadings below .6.
3.17 FI Factor Item Loadings

*Factor loadings of FI Social Relationships subscale.* The factor loadings were examined for the individual items on the subscales of the FI scale. Results can be found in Table 21.1. As can be seen all but one item loaded above .5, with only one item loading above .7 onto the Social Relationships subscale of the FI scale. Further, no items had loadings greater than .90, which indicates good divergent validity.

*Factor loadings of the QOL Work/School subscale.* Results can be found in Table 21.1. All but one item had loadings at .7 or greater. Those items demonstrated excellent convergent validity. No items had factor loadings greater than .9, demonstrating good divergent validity.

*Factor loadings of the FI Leisure Activities subscale.* Results can be found in Table 21.1. Two items had factor loadings at .7 or greater, though all items loaded at .6 and greater, which demonstrated adequate convergent validity. Again, no items had factor loadings greater than .9, which indicated excellent divergent validity.

*Factor loadings of the FI Autonomy subscale.* Results are displayed in Table 21.1. Five items had factor loadings of greater than .6 and three of those items with factor loadings of .7 and higher. No loadings were greater than .9, indicative of excellent divergent validity.

*Factor loadings of the FI Cognitive Functioning subscale.* Results are display in Table 21.1. All of the factor loadings were greater than .5, and six were greater than or equal to .7. None of the loadings was above .9, which indicates excellent divergent validity.
Table 21.1: QOLaFI Functional Impairment Scale – Item Factor Loadings.

<table>
<thead>
<tr>
<th>Social Relationships</th>
<th>Work/School</th>
<th>Leisure Activities</th>
<th>Autonomy</th>
<th>Cognitive Functioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR01</td>
<td>0.609</td>
<td>WS01 0.787</td>
<td>LA01 0.659</td>
<td>AU01 0.639</td>
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<tr>
<td>SR02</td>
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<td>WS02 0.805</td>
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<td>LA03 0.784</td>
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<td>AU04 0.511</td>
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<td>LA05 0.806</td>
<td>AU05 0.564</td>
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<td>SR06</td>
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<td>LA09 0.779</td>
<td>CF10 0.623</td>
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<td></td>
<td></td>
<td>CF13 0.572</td>
<td>CF14 0.562</td>
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</table>

Notes. N = 389. All ps < .001.

3.18 FI Subscale Factor Loadings

The subscale level factor loadings were also examined. Results are displayed in Table 22.1. As can be seen, the FI subscale factor loadings loaded moderately, with none of the scales loading below .6.

Table 22.1: Latent Factor Loadings of FI.

<table>
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<td>.633***</td>
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</table>

Note. N = 389. *** p < .001. 2-tailed.
Chapter 4

Discussion

The purpose of this study was to examine the psychometric properties of a newly developed disease-general measure of domain-specific quality of life and functional impairment and to provide next step recommendations based on the results. Having such a measure will be a step toward the direction of meeting the call by the NIMH and the WHO for having a broader assessment of health that includes functioning and quality of life. More pointedly, the field of quality of life has produced many measures; however, the field of psychology has continued to underutilize measures of quality of life and functioning. The fact that there are so many measures of quality of life and quite a bit of measures of functioning, it is quite possible that researchers and clinicians are overwhelmed by their choices. This seems especially true when quality of life and functioning is not one’s area of expertise. Further complicating matters, is that prior to the QOLaFI measure, researchers and clinicians would have to find two separate measures. Aside from reducing the burden of finding two measures in a vast and confusing literature, by having a combined disease-general measure, clinicians and researchers can reduce the demand on clients and participants who may be experiencing co-morbid psychopathology or co-morbid physical diseases and mental health disorders. Additionally, a domain-specific combined measure allows for a richer examination of
problems of quality of life and functioning. A measure that is comprehensive, while also being efficient. Thus, clinicians will have a psychometrically sound measure that is useable in the treatment context, not just to assess general outcomes. Given the benefits of such a measure, let us now turn our attention to the findings of the study.

Based on the confirmatory factor analysis, the five-factor model of QOL does not fit the data adequately. This lends some support for the need to assess a 6-factor model, where Social Relationships are parsed into two separate subscales (family/romantic relationships and friends). However, upon further examination of the item factor loadings, many items did not load well on the five factors. Thus, the fit of the five-factor model could improve after removing items that did not load adequately on their intended factors.

Despite the revisions needed to the scale, the QOL scale showed good convergent, concurrent, and discriminant validity, pointing to the scale’s good construct validity. Predictive validity was mixed, wherein the scale showed good predictive validity for anxiety symptoms but not depressive symptoms. This could be an artifact of the dataset where the majority of participants were not reporting depressive symptoms. Incremental validity was also mixed. The QOL scale demonstrated incremental validity over pre-existing measures of quality of life for predicting quality of life as it relates to depressive symptoms. The QOL scale did not demonstrate incremental validity over pre-existing measures of quality of life for predicting quality of life as it relates to anxiety symptoms. This could be that the QOL scale needs to be revised, and after revisions, the scale would have better predictive validity.
The CFA of the FI scale supported the overall model fit to the data. Further examination of items factor loadings suggest that minimal revisions are needed for the FI scale. Thus, with minimal revisions, the FI scale should be ready to use. Further, the FI scale of QOLaFI appears to be reliable and valid. Specifically, FI showed adequate to good convergent validity with pre-existing measures of FI. This was expected since pre-existing measures of functional impairment have many concerns with them, as discussed in the introduction of this paper. The question that the reader may have is whether the FI scale is measuring the construct of functional impairment. Concurrent validity was mixed, where the FI scale demonstrated concurrent validity toward the BDI-II but not the BAI. It is possible that the BAI is not a sensitive enough measure of anxiety symptoms with this sample of college students. The FI scale demonstrated predictive validity of depressive and anxiety symptoms. Further, the FI scale demonstrated discriminant validity.

The QOLaFI measure, after revisions, seems to provide a novel contribution to the field of psychology. No prior measures have included an assessment of domain-specific quality of life and functional impairment within the same measure. Additionally, the QOLaFI measure assesses the level of importance that the individual places on each domain. This addresses, on a theoretical level the need for individuals to assess the subjective importance of domains.

4.1 Limitations

The sample size was not adequate in order to split the data and cross-validate the models. While a long-term goal of the QOLaFI measure is to provide a reliable and valid measure of quality of life and functioning for use with clinical samples, the current
study did not recruit clinical population exclusively because this was the first step in assessing the measure. Thus, findings for clinical samples should be interpreted with caution. Further, a closer look at the mean and standard deviations of the BAI of this study indicated a much lower mean than what was found in the normed college sample, indicating that either this sample was less anxious than most college students or that this sample underreported anxiety symptoms. Further, the BAI may not be a sensitive enough measure of anxiety to compare QOL and FI to. Specifically, the BAI has been shown to measure more panic symptoms than other symptoms of anxiety (Cox, Cohen, Direnfeld, & Swinson, 1996). Given the concerns with the BAI, results on the concurrent and predictive validity of QOLaFI are inconclusive with anxiety symptoms.

4.2 Implications and Future Directions

First, the QOL and FI scales should be revised where items that did not load adequately on the intended subscales need to be removed from the scale. Next, the 6-factor model of QOL should be examined as a possible alternative model of QOL. After the scales are deemed psychometrically valid, further assessment of the sensitivity of the measure with various clinical populations with varying levels of severity should be completed. Along this line, utilizing a different measure to assess anxiety symptoms, perhaps a more disorder-specific measure (e.g., a social anxiety measure when assessing quality of life and functioning of individuals with social anxiety disorder) might yield more accurate and interpretable results on the concurrent, predictive, and incremental validity as well as the sensitivity of the QOLaFI over other measures. Once the scale has been fully refined, the QOLaFI measure can be used to provide a comprehensive measure
of quality of life and functional impairment that can be utilized in research and treatment outcomes.

The implications of this study include being able to provide a comprehensive tool for assessing domain-specific quality of life and functional impairment. The QOLaFI measure can be used in studies that examine psychopathology and general well-being to help address the health definition that the NIH and the WHO have called for. The QOLaFI measure can also be used in clinical settings to help clinicians address the impact of treatments on quality of life and functioning. Additionally, an examination of whether QOLaFI is useful in assessing quality of life and functional impairment when mental and physical health disorders are comorbid should be undertaken. Finally, given that Spanish speakers make up the largest minority in the United States, it follows that a future direction would be to translate QOLaFI into a culturally-sensitive Spanish version that is useful in research and clinical practice with diverse Spanish speakers.

A longer-term goal of this project will be to disseminate the QOLaFI measure for use in community-based mental health clinics, private practice, and to researchers conducting clinical trials so that research directly informs practice, and practice can inform research. In order to disseminate so that most people can access the measure, the QOLaFI will be available free, online with scoring software that is also free. Community mental health and private practitioners will be contacted using snowball sampling and informed about the QOLaFI. Once researchers and clinicians are utilizing the same quality of life and functional impairment measure consistently, the WHO and NIMH’s call to action will be addressed to the fullest extent.
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Appendix A

QOLaFI Measure

General Instructions. The following items address how important different areas of life are to you. Some items will be about how satisfied you are, while others will be about how well you are able to do certain things in your life. There are no right or wrong answers, so please answer based on your interpretation of each item.

Please respond to the following items using these response options:

- 1 = Extremely Unimportant
- 2 = Not Very Important
- 3 = Important
- 4 = Very Important
- 5 = Crucial

1. How important is having social relationships to you? 1 2 3 4 5
2. How important is work and/or school to you? 1 2 3 4 5
3. How important are leisure activities to you? 1 2 3 4 5
4. How important is your physical health to you? 1 2 3 4 5
5. How important is a clean living environment to you? 1 2 3 4 5
6. How important is being able to take care of yourself on your own (e.g., exercise, maintain a hygiene routine, and schedule and keep appointments)? 1 2 3 4 5
7. How important is being able to think clearly and take in and process information to you? 1 2 3 4 5
Please respond to the following items using these response options:

- 1 = Very Dissatisfied or Very Disappointed
- 2 = Dissatisfied or Not Satisfied
- 3 = Somewhat Satisfied
- 4 = Satisfied
- 5 = Very Satisfied

How would you rate your level of satisfaction with each of the following OVER THE LAST 2 WEEKS?

**Social Relationships**

1. [8] My conversations with my friends. 1 2 3 4 5
2. [9] The amount of time I spent with my friends. (Similar to LFQ & Lehman’s QOLI) 1 2 3 4 5
3. [10] My interactions with my friends. 1 2 3 4 5
4. [11] How helpful my friends were to me. 1 2 3 4 5
5. [12] How useful my friends made me feel. 1 2 3 4 5
6. [13] How well my friends treated me. 1 2 3 4 5
7. [14] How well I got along with others. (SIMILAR TO Lehman’s QOLI) 1 2 3 4 5
8. [15] How close I felt to my family. 1 2 3 4 5
9. [16] The amount of time I spent with my family. 1 2 3 4 5
10. [17] My romantic relationships. 1 2 3 4 5
11. [18] The number of opportunities I had to meet new people. (SIMILAR TO Lehman’s QOLI) 1 2 3 4 5
12. [19] My interactions with my family. 1 2 3 4 5
13. [20] My conversations with my family members. 1 2 3 4 5
15. [22] My ability to help others when they needed me. 1 2 3 4 5
Please respond to the following items using these response options:

- 1 = Very Dissatisfied or Very Disappointed
- 2 = Dissatisfied or Not Satisfied
- 3 = Somewhat Satisfied
- 4 = Satisfied
- 5 = Very Satisfied

How would you rate your level of satisfaction with each of the following OVER THE LAST 2 WEEKS?

**Work/School**

1. [23] Learning new skills. (SIMILAR to Frisch’s QOLI)  
   1 2 3 4 5

2. [24] Improving on skills that I already have.  
   1 2 3 4 5

3. [25] My interest in my current field of study or career.  
   (Similar to LFQ)  
   1 2 3 4 5

4. [26] The level of income I earn. (Similar to Lehman’s QOLI)  
   1 2 3 4 5

5. [27] The amount of hours I am working.  
   (Similar to Lehman’s QOLI)  
   1 2 3 4 5

6. [28] My education level or my progress towards a diploma/certificate/degree.  
   1 2 3 4 5

7. [29] Having to go to school and/or work.  
   1 2 3 4 5

8. [30] The school I attend and/or place that I work.  
   1 2 3 4 5

9. [31] Learning new knowledge.  
   1 2 3 4 5

10. [32] The level of income I can expect to make in my field.  
    1 2 3 4 5

**Leisure Activities**

1. [33] How I get to spend my free time.  
   (Similar to Lehman’s QOLI)  
   1 2 3 4 5

2. [34] The level of enjoyment I have when I am doing leisure activities. (Similar to Lehman’s QOLI)  
   1 2 3 4 5
Please respond to the following items using these response options:

- 1 = Very Dissatisfied or Very Disappointed
- 2 = Dissatisfied or Not Satisfied
- 3 = Somewhat Satisfied
- 4 = Satisfied
- 5 = Very Satisfied

How would you rate your level of satisfaction with each of the following OVER THE LAST 2 WEEKS?

3. [35] The amount of time I have to do leisure activities.
   1 2 3 4 5
   (Similar to Lehman’s QOLI)

4. [36] The level of enjoyment in participating in group activities.
   1 2 3 4 5

5. [37] Completing projects for fun.
   1 2 3 4 5

6. [38] Relaxing by myself.
   1 2 3 4 5

7. [39] Engaging in physical activities (like sports, hiking, yoga, martial arts, dancing).
   1 2 3 4 5

8. [40] Spending time alone watching TV, reading a book, or magazine, or surfing the internet.
   1 2 3 4 5

**Physical Health**

1. [41] My physical health.
   1 2 3 4 5

2. [42] The quality of my sleep.
   1 2 3 4 5

3. [43] The number of hours of sleep I get.
   1 2 3 4 5

   1 2 3 4 5

5. [45] The level of exercise I do.
   1 2 3 4 5

   1 2 3 4 5

   1 2 3 4 5

   1 2 3 4 5

   1 2 3 4 5
Please respond to the following items using these response options:

- 1 = Very Dissatisfied or Very Disappointed
- 2 = Dissatisfied or Not Satisfied
- 3 = Somewhat Satisfied
- 4 = Satisfied
- 5 = Very Satisfied

How would you rate your level of satisfaction with each of the following OVER THE LAST 2 WEEKS?

10. [50] My ability to seek health care when I need it.  

**Living Environment**

1. [51] To maintain a clean house without fighting with others about the house’s cleanliness. (Similar to LFQ)  
2. [52] My level of enjoyment toward performing household chores. (Similar to the LFQ)  
3. [53] The quality of my housework. (Similar to the LFQ)  
4. [54] The neighborhood I live in.  
5. [55] The house or apartment I live in.  
Please respond to the following items using these response options:

- 1 = Terribly
- 2 = Not well at all
- 3 = Somewhat well
- 4 = Well
- 5 = Very Well

How well were you able to do the following OVER THE LAST 2 WEEKS?

**Social Relationships**

1. [57] Talk with friends about personal matters.  \(1\ 2\ 3\ 4\ 5\)
2. [58] Talk with family about personal matters.  \(1\ 2\ 3\ 4\ 5\)
3. [59] Follow through when I make plans with others.  \(1\ 2\ 3\ 4\ 5\)

(SIMILAR TO Lehman’s QOLI)

4. [60] Spend time with family.  \(1\ 2\ 3\ 4\ 5\)
5. [61] Spend time with friends.  \(1\ 2\ 3\ 4\ 5\)
6. [62] Interact with new people.  \(1\ 2\ 3\ 4\ 5\)
7. [63] Get along with people I am close with.  \(1\ 2\ 3\ 4\ 5\)
8. [64] To be there for others when they needed me.  \(1\ 2\ 3\ 4\ 5\)

**Work/School**

1. [65] To complete tasks related to work and/or school.  \(1\ 2\ 3\ 4\ 5\)

(Similar to LFQ)

2. [66] To manage my time at work and/or school.  \(1\ 2\ 3\ 4\ 5\)
3. [67] To exert myself while at work and/or school.  \(1\ 2\ 3\ 4\ 5\)
4. [68] To engage in learning new skills.  \(1\ 2\ 3\ 4\ 5\)
5. [69] To work independently.  \(1\ 2\ 3\ 4\ 5\)
6. [70] To work as part of a team.  \(1\ 2\ 3\ 4\ 5\)
7. [71] To obtain new knowledge.  \(1\ 2\ 3\ 4\ 5\)
Please respond to the following items using these response options:

- 1 = Terribly
- 2 = Not well at all
- 3 = Somewhat well
- 4 = Well
- 5 = Very Well

How well were you able to do the following OVER THE LAST 2 WEEKS?

**Leisure Activities**

1. [72] Complete leisure projects, hobbies, or do-it-yourself projects that I started.
   
   1 2 3 4 5

2. [73] Find pleasure in my leisure activities.
   
   1 2 3 4 5

3. [74] Look forward to my leisure activities.
   
   1 2 3 4 5

4. [75] Have at least one leisure activity that I participated in every week. (Similar to the LFQ)
   
   1 2 3 4 5

5. [76] To have as much fun as others who do the same activities that I do. (Similar to the LFQ)
   
   1 2 3 4 5

6. [77] Engage in physical activities (like sports, hiking, martial arts, dancing).
   
   1 2 3 4 5

7. [78] Participate in leisure activities with other people.
   
   1 2 3 4 5

8. [79] Plan for leisure activities.
   
   1 2 3 4 5

9. [80] Participate in leisure activities by myself.
   
   1 2 3 4 5

**Autonomy**

1. [81] Complete errands (like grocery shopping, servicing your vehicle). (Similar to FAST)
   
   1 2 3 4 5

2. [82] Schedule and keep appointments (like doctor’s visits, meetings at work).
   
   1 2 3 4 5

3. [83] Take medications or vitamins.
   
   1 2 3 4 5
Please respond to the following items using these response options:

- 1 = Terribly
- 2 = Not well at all
- 3 = Somewhat well
- 4 = Well
- 5 = Very Well

How well were you able to do the following OVER THE LAST 2 WEEKS?

4. [84] Put in the effort to be presentable (for example, shower, groom self, wear an occasion-appropriate outfit) when I planned to be out in public.

(Similar to FAST) 1 2 3 4 5

5. [85] Make decisions on my own.

1 2 3 4 5

6. [86] Eat a balanced diet.

1 2 3 4 5

7. [87] Be in charge of my household. (Similar to FAST)

1 2 3 4 5

8. [88] Pay my bills.

1 2 3 4 5

**Cognitive Functioning**

1. [89] Take in new information quickly and efficiently.

(Similar to FAST) 1 2 3 4 5

2. [90] Remember important dates.

1 2 3 4 5

3. [91] Concentrate on tasks while I was completing them.

1 2 3 4 5

4. [92] Follow directions.

1 2 3 4 5

5. [93] Focus on a movie, TV show, or a book. (Similar to FAST)

1 2 3 4 5

6. [94] To recall where I put things.

1 2 3 4 5

7. [95] To perform mental calculations without paper or a calculator (like totaling the amount you are going to spend on groceries before you check out, or adding a tip to your bill at a restaurant).

(Similar to FAST) 1 2 3 4 5
Please respond to the following items using these response options:

- 1 = Terribly
- 2 = Not well at all
- 3 = Somewhat well
- 4 = Well
- 5 = Very Well

How well were you able to do the following OVER THE LAST 2 WEEKS?

8. [96] To problem-solve. (Similar to FAST)  1  2  3  4  5
9. [97] Control my emotions. (Similar to BRIEF)  1  2  3  4  5
10. [98] Adapt my mood to the mood of those surrounding me. (Similar to BRIEF)  1  2  3  4  5
11. [99] Evaluate my behaviors so that they fit the situation. (Similar to BRIEF)  1  2  3  4  5
12. [100] Respond in an appropriate (upset/hurt/sad) way when I was presented with bad news. (Similar to BRIEF)  1  2  3  4  5
13. [101] Be excited when a friend had good news to share even when I was having a bad day. (Similar to BRIEF)  1  2  3  4  5
14. [102] Know when I am about to say or do something inappropriate and to stop myself from doing so. (Similar to BRIEF)  1  2  3  4  5
15. [103] Be organized. (Similar to BRIEF)  1  2  3  4  5