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Validation of the MSPSS for Improving Outcomes of Patients

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LOMA LINDA UNIVERSITY
School of Science and Technology
in conjunction with the
Faculty of Graduate Studies

Validation of the MSPSS for Improving Outcomes of Patients

by

Garrett G. Chesley

A Thesis submitted in partial satisfaction of
the requirements for the degree of
Master of Arts in Experimental Psychology

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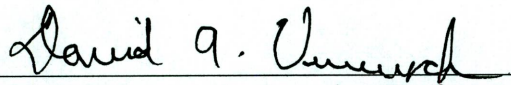
Each person whose signature appears below certifies that this thesis in his opinion is adequate, in scope and quality, as a dissertation for the degree Masters of Arts.



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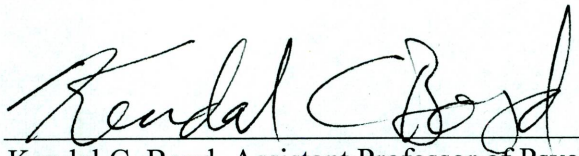

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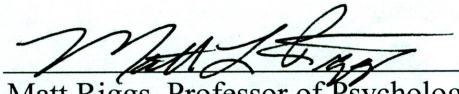

Matt Riggs, Professor of Psychology

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ABSTRACT OF THE THESIS

Validation of the MSPSS for Improving Outcomes of Patients

By

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Loma Linda University, August 2007
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Aim: About 30% of patients who enter psychotherapies are deteriorated. Statistical methods have been developed that allow for the identification of "at-risk" cases. Clinical support tools can be offered as a problem solving strategy to maximize treatment response and minimize deterioration.

One support tool, the Multidimensional Scale of Perceived Social Support (MSPSS) has been characterized as easy to use and effective with adequate psychometric properties. However, very few studies have explored its concurrent validity. The goal of this proposal is to assess the psychometric properties of the MSPSS to validate it for clinical use.

Methods: Two groups (a nonclinical group and a clinical group) will be compared on several measures of perceived social support and a measure of psychological distress to test the MSPSS and its ability to converge on established measures of perceived social support, to test the predictive validity of the MSPSS, and run a factor analysis.

Results: Analysis suggests sufficient convergent validity of the MSPSS with other established measures of perceived social support and adequate predictive validity showing a moderate relationship between deteriorating patient's psychological distress

and their level of social support. The factor analysis was successful in substantiating the factors of the MSPSS.

Discussion: In most cases, patients predicted to have a poor treatment outcome do not have adequate social support networks to initiate or maintain gains acquired in therapy. The patients' social support partially determines the amount of treatment necessary for positive outcomes. The adequacy of perceived social support directly relates to a patient's reported severity of symptoms and can mediate stressful life events and the development of psychological symptoms.

Introduction

That social relationships affect a person's emotional well-being seems obvious and naturally alluring. A close social relationship, or the desire for such relationships, is a fundamental human motivation that leads to psychological well-being or distress, depending on the quality of the relationships (Baumeister and Leary, 1995). Furthermore, social relationships influence behaviors that have implications for physical health. Health and social support have been found to increase longevity (Blazer, 1982; Cerhan and Wallace, 1997; Vogt, Mullooly, Ernst, Pope and Hollis, 1992), decrease the likelihood of heart attacks (Kaplan, Salonen, Cohen, Brand, Syme, and Puska, 1988) and upper respiratory illness (Cohen, Doyle, Skoner, Rabin, and Gwaltney, 1997), increase survival of breast cancer patients (Vogt et al.; Helgeson, Cohen, and Fritz, 1997), lower levels of physical morbidity in general and reduce the effects of life stressors on adverse outcomes (Cohen and Wills, 1985), lower levels of disease and mortality (Hanson, Isacsson, Janzo, and Lindell, 1989; Orth-Gomer, Rosengren, and Wilhelmsen, 1993), and aid in recovery from life-threatening illness (Berkman, Leo-Summers, and Horwitz, 1992; Williams, Barefoot, Califf, Haney, Sauders, Pryor, Hlatley, Siegler, and Mark, 1992). The health risks associated with an inadequately integrated social support network are comparable in enormity to those risks associated with cigarette smoking, high blood pressure, and obesity (House, Landis, and Umberson, 1988).

While there is a consensus that social support is important to both physical and mental health, defining the construct of social support and how it operates on or in conjunction with mental health has created some controversy and led to defining it in many ways. Some have argued that social support influences mental health by regulating

behaviors associated with psychological dysfunction through communicating appropriate social norms; that is, an individual expects to understand what is socially appropriate through a type of social exchange using reinforcement and punishment and through receiving necessary coping assistance (Caplan, 1974; Cassel, 1976; Thoits, 1986; Whittaker and Garbarino, 1983). *Actual* or *enacted support* refers to this type of operational definition, which often asks for estimates of the frequency with which social network members provide various supportive behaviors. Although this would seem important in understanding the social support construct, it is likely highly confounded with the *need* for support (Cohen and Wills, 1985; Coyne, Ellard, and Smith, 1990; Roberts and Gotlib, 1997). Another way of understanding social support and its affect on mental health is a person's *perceived support*. One theory of perceived support postulates that an evaluation or appraisal process of the social support network assists in regulating the amount of stress that affects psychological well-being (Scaefer, Coyne, and Lazarus, 1981). Another theory proposes that the perception of social support affects other various domains, like self-esteem or emotional support (Cohen and McKay, 1984). Perceived social support is most strongly associated with psychological distress, (Cohen and Wills, 1985; Fiore, Coppel, Becker, and Cox, 1986; George, Blazer, Hughes, and Fowler, 1989; Sarason, Shearin, Pierce, and Sarason, 1987) and is more important than actual support received in predicting adjustment to stressful life events (Wethington and Kessler, 1986).

Two of the main theoretical models of perceived support are the stress and coping or stress-buffering model, which emphasizes an appraisal process (see Figure 1) and the social constructionist model emphasizing social cognition (see Figure 2).

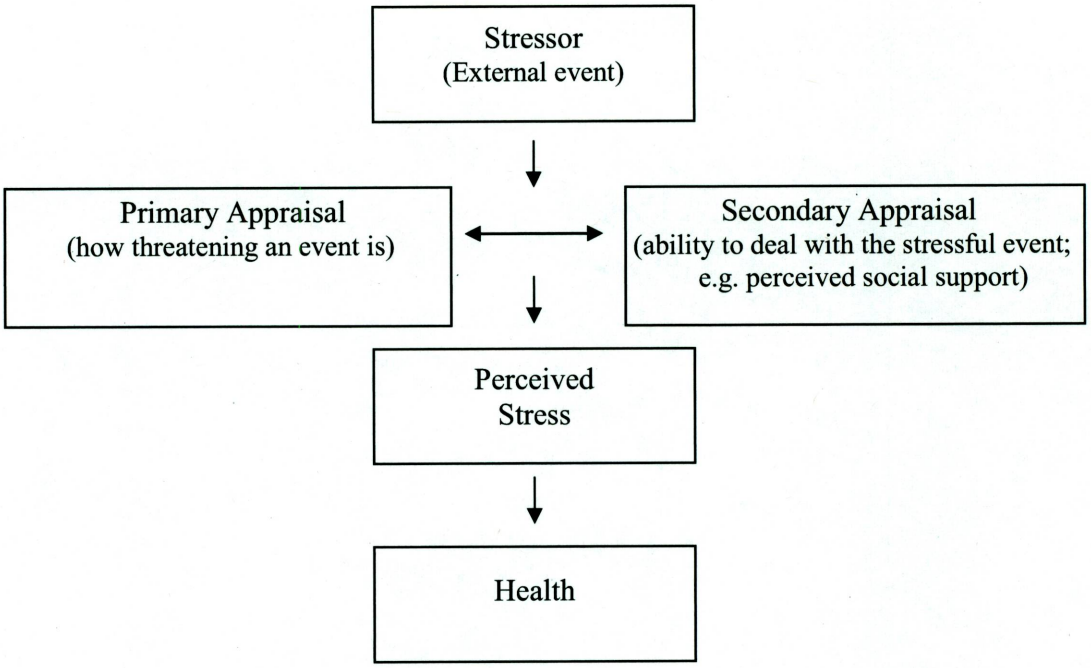

Figure 1

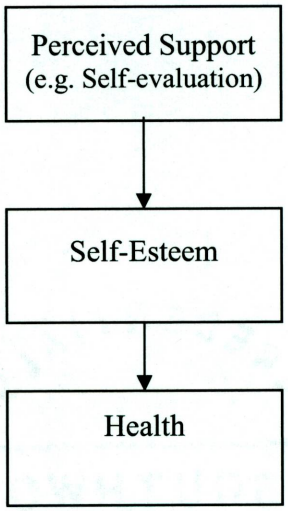

Figure 2

Stress, Coping, and the Role of Appraisal

The stress and coping perspective is one of the most influential theories in the social support literature. It posits that the perceived availability of social support reduces the effects of stressful life events by influencing the appraisal of the stressful event as less stressful because of the resources available during coping (Figure 1; Lazarus, 1966; Lazarus and Folkman, 1984; Moos and Billings, 1982). Therefore, stressful life events are less harmful to an individual who perceives a high degree of social support because such a perception leads him or her to interpret these events less negatively (Cohen and Hoberman, 1983; Cohen and McKay, 1984). It follows that how a person interprets (i.e. appraisals) a situation is very important in understanding the perceived stressfulness of the event and its consequences for health. It hypothesizes that appraisals that are more negative will lead to greater emotional distress (Lazarus, 1966; Lazarus and Folkman, 1984).

People make two types of appraisals when evaluating situations: primary and secondary. A primary appraisal is a judgment about how threatening an event is on the dimensions of harm-loss, threat, or challenge. A secondary appraisal is the evaluation a person makes about their own ability to deal with the stressful event and the social support available to them for coping with it. Since the more negatively a person appraises the event the greater the emotional distress (Lazarus and Folkman, 1984) it would be most effective if perceptions of support availability were to match or counter the specific needs elicited by the event (Cohen and Hoberman, 1983; Lakey and Cohen, 2000; Cohen and McKay, 1984). Thus, measurements of perceived social support should

include evaluations of the quality or availability of different types of support and their different support functions.

In summary, this perspective predicts that perceived social support is beneficial to health to the extent that it influences the appraisal process favorably. A favorable appraisal of one's social support would be one that a) reduces the effects of stress and b) has the capacity to match or counter the stressful events specific to the situation. The reduction in stress is beneficial to health in that a higher level of perceived support attenuates the relationship between stress and health.

Social Constructionist Perspective and Social Cognition

The pragmatic philosophy of James, Dewey, and Mead provides the foundation for the social constructionist perspective that views reality as social constructs. A person creates a social construct from theories and concepts about the world that reflect a social context and their perceived reality. It is not considered veridical reality (Dewey, 1917/1997). Since groups of people differ in their perceptions of reality, there is little, if any, clear social consensus. These differences are therefore important to understand how people interpret their worlds and how these interpretations affect outcomes (Lakey and Cohen, 2000; Kelley, 1969).

Social cognition operates on the premise of the perceived stability of the social readiness of others to help. The perceived stability of these social relationships filters the everyday thinking of a person so that their thoughts fit these preexisting beliefs. Consequently, those with high levels of perceived support interpret behaviors as supportive, have a better memory for supportive behaviors, display greater attention to supportive behaviors, and are able to think about social support with greater ease and

speed (Baldwin, 1992; Lakey and Cassady, 1990; Lakey and Drew, 1997). Although actual support received and other more "objective" ways of conceptualizing social support are important, it has been observed that perceived support is more strongly influenced by the support recipients' evaluations of the underlying personality characteristics of those who would be providing support than by the actual support received (Lakey, Ross, Butler, and Bentley, 1996). That is, the social constructs a person creates (i.e. perceived reality) about the stability of their social support network (i.e. underlying personality characteristics of individuals) is more important than what actually happens.

Figure 2 illustrates the social cognitive perspective. Cognitive models of emotional disorders have provided the foundations upon which this model is derived (Beck, Rush, Shaw, and Emory, 1979). Evidence suggests that self-evaluation is strongly associated with perceived support (Barrera and Li, 1996; Lakey and Cassady, 1990; Maton, 1990) and that thinking about specific social relationships influences self-evaluation and emotion (Baldwin, Carrell, and Lopez, 1990; Baldwin and Holmes, 1987; Baldwin and Sinclair, 1996). An apparent discontinuity exists between patterns of relationships between individuals and between groups, with the latter being characterized as more negative, competitive, and abrasive (Insko and Schopler, 1998). Therefore, it expects that an individual will think about and relate differently to groups than to more intimate relationships. In fact, a person's identities to social groups are important determinants of many aspects of that individual's thoughts, feelings, and social behaviors (Smith, Murphy, and Coats, 1999). Smith and Henry (1996) demonstrated that incorporated into the self are the in-groups of an individual and Aron, Aron, Tudor, and

Nelson (1991) established that mentally represented as part of the self is an individual's relationship partner. Therefore, negative thoughts about social relations have common characteristics with or reflect thoughts and feelings about the self, which then overlap with and promote emotional distress (Baldwin and Holmes, 1987; Lakey and Cassady, 1990).

Applying this model to social support would suggest new predictions and emphases not found in the stress and coping model. Intertwined together is a person's assessment of their social relationships and their self-evaluation, so that the "self" becomes a reflection of their perception of how others view them (Mead, 1934). This is problematic for the stress and coping model since it emphasizes a stress situation-specific view that oversimplifies complex patterns of social interaction into unidimensional schemes (Ptacek and Gross, 1997). The social constructionist model also advocates that there may be no clear consensus between individuals or groups as to what constitutes supportive behaviors. As a result, the social constructionist model predicts that negative thoughts about social relationships are themselves sufficient to elicit negative emotion; thus conceptualizing perceived social support and its relation to health as more than an appraisal process of a stress-specific situation.

Perceived Social Support and Therapy Outcomes

Regardless of underlying theoretical explanations, perceived social support is well documented as having a significant influence on health and well-being (Cohen and Wills, 1985; Unchino, Cacioppo, and Kiecolt-Glaser, 1996). For example, social support negatively correlates with symptoms of depression (Billings, Cronkite, and Moos, 1983; Blazer, 1983; Mitchell and Moos, 1984; George, Blazer, Hughes, and Fowler, 1989;

Schaefer, Coyne, and Lazarus, 1981; Zlotnick, Shea, Pilkonis, Elkin, and Ryan, 1996) neurosis, (Henderson, Byrne, Duncan-Jones, Adcock, Scott, and Steele, 1978) and negative morale (Schaefer et al., 1981). Given the importance of this construct in predicting a person's health and the conservative estimates that indicate patients spend less than 1% of their waking hours in psychotherapy sessions, it is imperative that treatment programs consider clients' perceived social support. This estimate is consistent with Lambert's (1992) findings that report 40% of therapy outcome variance is due to extratherapeutic factors. He continues in suggesting that social support is one of these extratherapeutic factors in the client's environment that aid in recovery (Lambert, 1992) and that the scientific community attend more carefully to discovering the many curative factors that exist in the environment (Lambert, 1976).

Existing in the literature is a dialog of whether it is the quantity or the quality of a person's social support that contributes an essential difference to psychological health. In testing a barrier theory of perceived social support with persons living with HIV or AIDS, Serovich, Brucker and Kimberly (2000) concluded that the quantity of friends and family members in the social network are as important as the quality of those relationships. Although the extent to which these results generalize to other stigmatized populations is unclear, they are worth considering while treating similar populations. In a related study comparing a nonpatient and patient group, Marziali (1987) found that demographic variables of sex, age, and socioeconomic status (SES) contribute in an important manner in estimating both the quantity and quality of social support. In addition, results indicated that at one-year follow up, patients' perceptions of social support relationships before psychotherapy are associated significantly with levels of

improvement in social adjustment and that brief psychotherapy positively affects patients' perceptions of the quantity and quality of social support. Another study examined the effects of parent, teacher, and peer social support on adolescents and found that females perceived significantly more support from friends than males and males perceive significantly more support from fathers than females (Colarossi and Eccles, 2003). This research indicates that whether it is the quality or quantity of relationships that is important may depend on both the gender and developmental period of the support recipient. Attachment anxiety and avoidance have been found to effect perceptions of social support and that the satisfaction an individual experiences with his or her social support is rather complicated and cannot be characterized by a unidimensional attachment pattern. Instead, people have mental representations applicable to specific relationships and people in general (Smith, Murphy, and Coats, 1999). The research seems to imply that both the quality of a person's social relationships and the quantity of social relationships matter to psychological health.

The effects of social support tested in various populations have produced consistent results. In discovering the factors relating to burnout among psychiatrists, Lozinskaia (2002) found that a lack of social support is a significant factor. In a related study of newly appointed women teachers in adverse work environments, it was reported that social support was among the factors that affected spring depressive symptoms, self-esteem, job satisfaction, and motivation to teach (Schonfeld, 2001). Therapy outcomes of young boys who had been sexually abused were favorably related to social support (Fredrick, Luecke, Beilke, and Place, 1992). Those recovering from alcoholism that made social investments in their social networks were more likely to abstain from

posttreatment alcohol involvement, have more supports that did not use drugs, and have higher self-esteem (Langabaugh, Beattie, Noel, Stout, and Malloy, 1993; Richter, Brown, and Mott, 1991). Pertaining to the quality of life experienced by adults with mild intellectual disabilities, the level of social support explained a significant proportion of variance beyond what social strain accounted for (Lunsky and Benson, 2001). In a study relating health and psychosocial variables to home satisfaction in older adults, Klein (1993) found that self-esteem, social support, and locus of control best predicted life satisfaction. These results are consistent with other findings dealing with adult perceptions of social support and their cognitive appraisals (i.e. global and stable appraisals) of negative outcomes (Brewin, MacCarthy, and Furnham, 1989). Another study of older adults similarly found that those with low levels of social support and low self-worth experienced an increased risk, and a consequently higher level, of psychosomatic symptoms (Cho, Donnan, and Sham, 1988). Additionally, in a study using outpatients with major depressive disorder, no main effects or significant interaction effects were found involving gender differences in relation to therapy outcomes and social support indicating that there may not be a different process in outcome of illness for men and women (Zlotnick, Shea, Pilkonis, Elkin, and Ryan, 1996).

A number of studies have addressed the relationship between social support, self-esteem, stress, and treatment outcomes. In a cross-sectional study of systematic lupus erythematosus (SLE) patients, where stress was defined by severity of daily hassles, it was reported that high stress and poor social support were associated with psychological distress and the physical health of SLE patients (Dobkin, Fortin, Joseph, Esdaile, Danhoff, and Clarke, 1998). In patients with major depression, incomplete recovery or

non-improvement was related to the relationship of personality with low social support and low self-esteem indicating the need to take personality and social variables into account during treatment (Ezquiga, Garcia, Bravo, and Pallares, 1999). Bereavement due to loss of a spouse was investigated in relation to self-esteem and social support. The results indicate that those who eventually remarried demonstrated more positive outcomes, which implicate those aspects of social support and self-esteem that are components of a marital relationship (Burks, Lund, Gregg, and Bluhm, 1988). In determining the amount of parental stress mothers felt, low self-esteem and low social support were associated with higher stress levels and increased psychological distress and somatic symptomatology (Koeske, and Koeske, 1990). While evaluating children and their caregivers who were living in poverty, social support was found to be a positive mediator of a child's perceived stress and self-esteem. The results indicate that enhancing children's social support may positively influence their self-esteem (Guest and Biasini, 2001).

Kahn, Achter and Shambaugh (2001) reported that clients tendencies to disclose (versus conceal) personally distressing information positively correlated with perceived social support. One implication is the need for the therapist to view themselves as part of their client's social support system. Andrews, Tennant, Hewson, and Vaillant (1978) concluded that the risk of psychological impairment rises 5-fold to those under stress, without social support, and with poor coping skills. They attribute this to the way people who are under these circumstances view their social world, that is, threateningly. As a result, they underestimate the extent of social support available to them. The authors also

suggested that a person creates their own lack of social support in consequence of their neuroticism.

Accordingly, patients predicted to have a poor treatment outcome may not have adequate social support networks to initiate or maintain gains acquired in therapy. The patients' social support partially determines the amount of treatment necessary for positive outcomes. Those patients with a close confidant and less family conflict showed better outcomes with brief therapy and those without a close confidant and who had more family conflict experienced better outcomes with longer treatment (Moos, 1990). This suggests that the client's social support is partly accountable for the length of treatment required to retain gains made in therapy while paying particular attention to family and a significant other in the client's social network. Furthermore, the adequacy of perceived social support directly relates to a patient's reported severity of symptoms and can mediate stressful life events and the development of psychological symptoms (Monroe, Imhoff, Wise, and Harris, 1983). It is largely advocated that therapists need to compensate for the reduced levels of social support experienced by their clients (Campbell, 1996). For such patients, therapists may need to identify what social support resources a patient already has in their current situation or community and utilize these resources to achieve a better treatment outcome (Bankoff and Howard, 1992; Evans, 1993).

Perceived Social Support and Psychotherapy Quality Management

Given that perceived social support demonstrates to be predictive of psychotherapy outcome, it is important that clinicians are aware of patients' perceptions of social support. Psychotherapy quality management systems developed recently in the United States (Lambert, 2001; Lambert, Hanson, and Finch, 2001; Lueger, Howard, Martinovich, Lutz, Anderson, and Grissom 2001), Germany (Kordy, Hannöver, and Richard, 2001), and the United Kingdom (Barkham, Margison, Leach, Lucock, Mellor-Clark, Evans, Benson, Connell, Audin, and McGrath, 2001) have sought to measure ongoing patient response to treatment and feed back this information to clinicians in an attempt to improve the effects of psychotherapy.

One of these systems developed by Lambert and colleagues, tracks patient progress on a session-by-session basis and feeds back this information to clinicians in order to assist them in treatment planning. In a series of studies aimed at assessing the impact of feedback on patient outcomes, Lambert and colleagues (Lambert, Whipple, Smart, Vermeersch, Nielsen, and Hawkins, 2001; Lambert, Whipple, Vermeersch, Smart, Hawkins, Nielsen, and Goates, 2002) found that feedback improves outcomes for patients who are deteriorating in therapy and are predicted to drop out of therapy or have a poor final outcome. While outcomes of deteriorating patients whose therapists received feedback significantly improved in comparison to outcomes of deteriorating patients whose therapists did not receive feedback, the authors noted that, many of these patients still failed to achieve a satisfactory outcome.

In an attempt to further improve the effects of feedback for deteriorating patients, Whipple, Lambert, Vermeersch, Smart, Nielsen, and Hawkins (2003) developed clinical support tools, which were intended to be used with patients who are deteriorating in

psychotherapy. The clinical support tools were developed and selected based on variables that the empirical literature demonstrated to be most predictive of patient outcome. Therefore, when a patient was identified as a potential treatment failure, the therapist was provided with clinical support tools, which included three instruments that could be administered to the deteriorating patient: Helping Alliance Questionnaire (HAQ-II), Stages of Change Scale (SCS), and the Multidimensional Scale of Perceived Social Support (MSPSS). If a patient completed any of these measures, provided to the therapist was the completed scored measure(s) and normative data that would assist the therapist in interpreting the measure. The study suggested that when therapists utilized CSTs (which include the Multidimensional Scale of Perceived Social Support) in working with deteriorating patients, that improvements in outcome were both statistically and clinically meaningful.

Clinical Significance and Reliable Change

One way of improving the interpretability of the MSPSS for the therapist is by calculating cutoff scores, thereby providing a Reliable Change Index (RCI) and equipping the therapist with the ability to identify a clinically significant change in social support in their clients. Using formulas developed by Jacobson and Truax (1991), we propose to analyze clinical and normative data collected for the MSPSS to provide cutoff scores for the RCI and clinically significant change. If the change in scores is by a certain amount in either a positive or a negative direction, then the therapist may consider the client as having made a "reliable change." The therapist will then be able to make an objective distinction between a "recovered" or "improved" client in terms of their social support.

Jacobson and Truax (1991) conceive of two criteria that determine the difference between a client that has achieved an improvement or a recovery. The first criterion is indicative of a clinically meaningful change in that the degree of change must exceed measurement error based on the reliability of the MSPSS. The second criterion requires movement from a score typical of a dysfunctional population to a score typical of a functional population (Kendall, Marrs-Garcia, Nath, and Sheldrick, 1999). To fulfill this second criterion we will calculate a cutoff score that represents the point at which a person's score is more likely to come from the dysfunctional population than a functional population. When a client's score reaches above the MSPSS's cutoff score the patient's functioning is similar to a non-patient's level of functioning at that point in time. Passing this cutoff (from dysfunctional to functional) is the second criterion posited by Jacobson and Truax (1991) as an indicator of clinically significant change. Patients who show reliable change and pass the cutoff are considered "recovered," while those who only show reliable change are considered "improved."

Multi-Dimension Scale of Perceived Social Support

The Multidimensional Scale of Perceived Social Support (MSPSS) has been characterized as easy to use, self-explanatory, and effective with strong test-retest reliability, internal reliability, factorial validity, and subscale validity (Zimet, Dahlem, Zimet, and Farley, 1988; Zimet, Powell, Farley, Werkman, and Berkoff, 1990). More recently, confirmatory studies on the psychometric properties of the MSPSS suggested that it has strong factorial validity and good internal reliability (Dahlem, Zimet, and Walker, 1991; Stanley, Beck, and Zebb, 1998).

In addition to being examined in the United States, the MSPSS has been analyzed in Italy (Prezza and Pacilli, 2002), Spain (Landeta and Calvete, 2002), Turkey (Eker and Arkar, 1995; Eker, Arkar, & Yaldiz, 2000), China (Chou, 2000), and Canada (Kazarian and McCabe, 1991). It has also been subjected to various populations from urban African-American adolescents (Canty-Mitchell and Zimet, 2000), pregnant women (Zimet, Powell, Farley, Werkman, and Berkoff, 1990), and older adults (Stanley, Beck, and Zebb, 1998) to psychiatric and surgery patients (Cecil, Stanley, Carrion, and Swann, 1995; Eker and Arkar, 1995; Eker, Arkar, and Yaldiz, 2000; Kazarian and McCabe, 1991). In an effort to gain insights into the condition of a patient's perceived support and to improve the effects of psychotherapy the MSPSS seems an ideal instrument. However, very few studies have explored its concurrent validity.

Hypotheses

The goal of this proposal is to assess the psychometric properties of the MSPSS to validate it for clinical use. This was accomplished by:

Hypothesis 1

Assessing the measure's within construct validity by relating it to other measures of perceived support.

a. We hypothesize that the MSPSS will share a similar positive correlation with the Perceived Social Support Scale (PSS) and the Social Support Behaviors Scale (SS-B) that they (the PSS and SS-B) share with each other.

b. More specifically, we hypothesize high positive correlations with the MSPSS Friends and Significant Other subscales and the PSS Friends subscale (PSS-Fr).

We predict a similar magnitude of positive correlation between the MSPSS Family subscale and the PSS Family subscale (PSS-Fa).

c. Additionally, we hypothesize that the MSPSS Friends and Significant Other subscales will demonstrate high positive correlations with the Friends subscale of the SS-B, and the MSPSS Family Subscale will show a comparable positive correlation with the Family subscale of the SS-B. We expect there to be intercorrelations between the other subscales (e.g. the MSPSS Family subscale and the PSS Friends subscale) but not significant correlations since we believe these to be relatively distinct from each other.

Hypothesis 2

Assessing the measures between construct validity by relating it to a measure of psychological distress.

d. We hypothesize that the PSS, the SS-B, and the MSPSS will produce similar high negative correlations with the Outcome Questionnaire (OQ-45).

e. Specifically, we postulate that the MSPSS subscales of Family, Friends, and Significant Other will each generate a moderate to high negative correlation with the Interpersonal Relationships subscale of the OQ-45. The MSPSS subscales will correlate less highly with the Social Role Performance subscale, and least highly with the Symptomatic Distress subscale of the OQ-45, but still demonstrate a moderate negative correlation.

Hypothesis 3

Further validating the psychometric properties of the MSPSS by investigation of its predictive validity. We expect the relationship between the MSPSS and the OQ-45 to reflect the connection that exists between perceived social support and health described in the literature. That is, an inverse relationship should exist between psychological distress and social support.

f. The MSPSS scores at pre-treatment will be predictive of OQ-45 post-treatment scores in the clinical group.

g. It is expected that scores in the nonclinical group will remain relatively stable from time one and time two on the MSPSS and OQ-45. It is also expected that scores will be indicative of greater pathology on the MSPSS from time one and time two in signal cases in the clinical group, as these participants are those who are not responding to therapy and are, by definition, worsening on the OQ-45.

Hypothesis 4

Factor analysis of the MSPSS subscales. Theoretically, we expect to extract three factors relating to the three subscales of the MSPSS. Specifically, we anticipate the Family subscale to consist of items 3, 4, 8, and 11, the Friends subscale to be composed of items 6, 7, 9, and 12, and the Significant Other subscale to be fashioned by items 1, 2, 5, and 10.

Hypothesis 5

Calculating a cutoff score between the clinical and nonclinical samples, using time one data, in order to generate a Reliable Change Index (RCI) and clinically significant change to increase interpretability of the measure.

Materials and Methods

Participants

Participants included one nonclinical and one clinical group. The nonclinical group consisted of 69 undergraduate psychology students at Brigham Young University (BYU). The clinical group included 1534 clients that were taken from an archival data set at the BYU Counseling and Career Center. Exclusionary criterion includes age, since we will only be testing adults, and whether or not the participants completed the questionnaires. Two participants in the nonclinical group failed to complete the questionnaires and were excluded from the study leaving 67 participants. Of the 1534 clinical participants, 472 failed to complete the questionnaires and were subsequently dropped from the study leaving 1062 participants. Nonclinical participants were administered the battery immediately prior to class. Participation was voluntary. The final sample ranges in age from 18-53 years ($M = 22.8$, $SD = 3.7$). Of this, approximately 62% were female; 88% were Caucasian, 5% were Hispanic, 3% were Pacific Islander/Asian, 1% were African American, and 3% were of mixed ethnicity. Sixty-nine percent of the total sample reported being single, 30% were married, and 1% reported being either separated or divorced.

Group level demographic data for the sample show the age range for the clinical group from 18-53 years ($M = 22.71$, $SD = 3.58$) as compared to the age range from 20-50 years ($M = 24.2$, $SD = 5.1$) in the nonclinical group. Approximately 61% were female in the clinical group compared to 72% female participants in the nonclinical group. Sixty-nine percent reported being single, 30% reported being married, and 1% being either separated or divorced in the clinical group. The nonclinical group reported 75% were

single and 25% were married. In the clinical group, approximately 89% were Caucasian, 6% were Hispanic, 3% were Pacific Islander/Asian, 1% were African American, 0.7% were of mixed ethnicity, and 0.3% were other. In the nonclinical group, approximately 88% were Caucasian, 6% were Pacific Islander/Asian, 5% were of mixed ethnicity, and 1% as other. Demographic information is presented on Table 1.

Table 1
Descriptive Statistics on Demographic Variables

	Clinical group	Nonclinical group	Total
Demographic variable	Percent (M, SD)	Percent (M, SD)	Percent (M, SD)
Age	(22.71, 3.58)	(24.20, 5.10)	(22.80, 3.70)
Gender			
Female	61%	72%	62%
Male	39%	28%	38%
Marital Status			
Single	69%	75%	69%
Married	30%	25%	30%
Separated/Divorced	1%	0%	1%
Ethnicity			
Caucasian	89%	88%	89%
Hispanic	6%	0%	5%
Pacific Islander/Asian	3%	6%	3%
African American	1%	0%	1%
Multi-racial	0.70%	5%	1%
Other	0.30%	1%	1%

Measures

Perceived Social Support.

This study will use the Multidimensional Scale of Perceived Social Support to measure a person's perceived social support (MSPSS; Zimet, Dahlem, Zimet, and Farley, 1988). The MSPSS is a twelve-item inventory designed to measure three sources of perceived social support: Family, Friends, and a Significant Other (Zimet, Dahlem, Zimet, and Farley, 1988). A confirmatory factor analysis extracted three factors with

high item loadings on the factors intended with minimal cross-loadings. Each of the three subscales contains four items scored on a 7-point Likert scale from 1 (very strongly disagree) to 7 (very strongly agree). A patient's score on the MSPSS is the mathematical average of the combined individual items ($M = 5.58$, $SD = 1.07$). The MSPSS is psychometrically sound with internal reliability coefficients (Cronbach's α) of .87, .85, .91, and .88 for the Family, Friends, and Significant Other subscales and total scale, respectively. Test-retest estimates were between $r = .72$ and $r = .85$ for each of the subscales and total scale (Zimet, Dahlem, Zimet, and Farley, 1988).

To test the MSPSS and its ability to converge on established measures of perceived social support the Perceived Social Support Scale (PSS) and the Social Support Behaviors Scale (SS-B) will be used. The PSS is an instrument designed to measure the perception one has for the need or degree of support as satisfied by family and friends. The PSS is a 40-item test with two subscales from Friends (PSS-Fr; cronbach's α =.88) and from Family (PSS-Fa; cronbach's α =.90) (Procidano and Heller, 1983). It shows internal consistency and factor analysis suggests that it appears to measure valid constructs that were separate from each other and from social network measures. PSS-Fr and PSS-Fa both inversely related to symptoms of distress and psychopathology; however, the relationship was stronger for PSS-Fa. PSS-Fr closely related to social competence while PSS-Fa was unaffected by either positive or negative mood states; however, the reporting of PSS-Fr was lowered by negative mood states. People who score high on PSS-Fr were significantly lower in trait anxiety and talked about themselves more to friends and siblings than people who score low on PSS-Fr. Those

who score low on PSS-Fa show marked verbal inhibition with siblings (Procidano and Heller, 1983).

The Social Support Behaviors Scale (SS-B; Vaux, Riedel, and Stewart, 1987) uses a 5-point scale producing a range of 45-225 and is designed to assess five domains of social support: emotional, socializing, practical assistance, financial assistance, and advice or guidance. It consists of 45-items and separately assesses available supportive behavior for Family and Friends. It has very good internal consistency with alphas exceeding .85 for the full scale and .80 or greater for subscales. It has also been shown to have good concurrent validity by correlating significantly with social support network associations, support appraisals, and the Inventory of Socially Supportive Behaviors. The SS-B is considered an important measure both for the study of social support and for use in clinical practice as a way of understanding real and potential supports available for clients (Vaux, Riedel, and Stewart, 1987).

Symptomology.

The Outcome Questionnaire (OQ-45) assesses psychological dysfunction (Lambert, Hansen, Umphress, Lunnen, Okiishi, and Burlingame, 1996). The OQ-45 (Lambert, Hansen, et al., 1996) measures client progress in therapy by repeated administration during the course of treatment and at termination and integrates Lambert's (1983) conceptualization of client progress that suggests three aspects of the client's life should be monitored: (a) subjective discomfort (intrapsychic functioning), (b) interpersonal relationships, and (c) social role performance. Items on this instrument address commonly occurring problems across a wide variety of disorders and tap the symptoms most likely to occur (e.g., "I feel blue," "I feel lonely," "I work/study too

much"). The items also measure personally and socially relevant characteristics that affect the individual's quality of life. Each item is scored on a 5-point scale from 0 (never) to 4 (almost always), yielding a range of possible scores of 0 to 180 with higher values indicating the endorsement of pathology. Completion of the OQ-45 takes approximately 5 minutes. The OQ-45 provides a total score, based on all 45 items, as well as three subscale scores.

Lambert, Hansen, et al. (1996) reported adequate internal consistency for the OQ-45 (r = .93). The 3 week test-retest value for the OQ-45 is also satisfactory (r = .84) (Lambert, Burlingame, Umphress, Hansen, Vermeersch, Clouse, and Yanchar, 1996). Concurrent validity figures, as estimated by correlating the total score with the SCL-90-R (Derogatis, 1983), BDI (Beck, Ward, Mendelson, Mock, and Erbaugh, 1961), Zung Depression Scale (Zung, 1971), Taylor Manifest Anxiety Scale (Taylor, 1953), STAI (Spielberger, 1983; Spielberger, Gorsuch, and Lushene, 1970), Inventory of Interpersonal Problems (Horowitz, Rosenberg, Baer, Ureno, and Villesenor, 1988), and the Social Adjustment Scale (Weissman and Bothwell, 1976) were all significant at the .01 level (range of r's, .50-.85). Normative information based on data collected across the country for the OQ-45 has been reported (Lambert, Hansen, et al., 1996; Lambert, Burlingame, et al., 1996; Umphress, Lambert, Smart, Barlow, and Clouse, 1997). Furthermore, the OQ-45 has been shown to be sensitive to change in clients over short time periods while remaining stable in untreated individuals (Vermeersch, Lambert, and Burlingame, 2000).

Design and Procedures

Each participant in the undergraduate sample was given a battery of measures, which included the MSPSS, SS-B, PSS, the OQ-45 and a consent form. They were tested

in a classroom setting, with a proctor administering the instruments. Retest administration occurred in the same procedure two weeks following the initial testing period. The clinical sample will be archival data from a previous study. Clinic receptionists who administered the OQ-45 and the MSPSS prior to the patient's first therapy session typically collected data pertaining to this sample. Included in the test packet was information pertaining to subject confidentiality as well as a consent form. Subsequent OQ-45 and MSPSS scores for retest administration were collected in a similar fashion with the MSPSS only being administered at the time the client became a signal case (i.e. non-responder or deteriorating in therapy).

Analysis.

We performed a preliminary analysis using independent t-test and chi-square analysis of independence to determine that there are no statistically relevant differences between the nonclinical and clinical samples on demographic variables (age, gender, etc.).

A*nalysis for hypothesis 1.* Pearson correlation coefficient (*r*) was used to evaluate the degree of relationship between the MSPSS total score and the PSS total score and the SS-B total score. It was also used to evaluate the relationships between the MSPSS subscales and the PSS subscales and the SS-B friends and family subscales.

A*nalysis for hypothesis 2.* Pearson correlation coefficient (*r*) was used to evaluate the degree of relationship between the OQ-45 and the MSPSS, the PSS, and the SS-B.

A*nalysis for hypothesis 3.* Linear regression was used to evaluate the predictive validity of the MSPSS with the OQ-45. Paired samples T-tests were used on the MSPSS

and the OQ-45 scores to investigate whether there are significant differences between how participants in the different groups changed on the MSPSS and the OQ-45.

A*nalysis for hypothesis 4.* Factor analysis

A*nalysis for hypothesis 5.* The following equations were used to calculate cutoff score (C) and the reliable change index (RCI) for the MSPSS:

$C=(SD_1)(mean_2)+(SD_2)(mean_1)/SD_1+SD_2$

$RCI = (S_{diff})(1.96)$; where $S_{diff}=\sqrt{2}S_e^2$, where $S_e=SD\sqrt{1-r_{xx}}$, where r_{xx}=internal consistency.

Results

Descriptive Statistics

Prior to analysis, the MSPSS scales, SS-B scales, PSS scales, OQ-45 scales, and change scores on the MSPSS and OQ-45 were examined through a variety of techniques to assure accuracy of data entry, missing values, and fit between their distributions and the assumptions of correlational analysis. The variables were examined separately for the clinical and nonclinical groups.

Two participants in the nonclinical group failed to complete the questionnaires and were excluded from the study leaving 67 participants. Of the 1534 clinical participants, 472 failed to complete the questionnaires and were subsequently dropped from the study leaving 1062 participants. Data imputation was performed using expectation maximization (EM) on the following variables due to missing values of more than 5% of the cases for time one and time two in the nonclinical group: MSPSS scales, SS-B scales, PSS scales, and OQ-45 scales. EM has been described as an advantages procedure for missing data because of its ability to avoid overfitting and producing realistic estimates of variance (Tabachnick and Fidell, 2001). Pairwise linearity was checked using scatterplots and found to be satisfactory.

Several analyses were performed to compare the clinical and nonclinical groups on demographic variables. An independent samples t-test was produced comparing the clinical and nonclinical groups on age $t\ (67) = 2.30, p < .05$. The results were statistically significant at alpha level of .05 indicating a difference between the clinical and nonclinical groups on age. However, the difference between the means of the two groups ($M_1 - M_2 = 1.49$) is clinically irrelevant. Chi-square analyses were performed on the

categorical demographic variables with respect to differences between the clinical and nonclinical groups as a test of independence. Marital status and gender results were both found to be nonsignificant, $\chi^2(3, N = 1060) = 1.394, p = .707$; $\chi^2(1, N = 1078) = 3.192, p = .074$ respectively, indicating that there are no significant differences between the clinical and nonclinical group on marital status or gender. Ethnicity resulted in a significant difference between the clinical and nonclinical groups, $\chi^2(5, N = 1043) = 51.428, p < .05$, suggesting that in terms of ethnicity the two groups are not equal.

The variables were examined at the univariate level for outliers. The criteria for deciding between what is or is not considered an outlier was set at three standard deviations above or below the mean. The majority of variables had one or more outliers, which resulted in 38 outliers being deleted. Due to the moderate negative skew on PSS family total score on both time one and time two variables, these two variables were reflected and a square transformation was applied.

The means and standard deviations of the MSPSS scales, the PSS scales, SS-B scales, and the OQ-45 scales for both time one and time two are presented in Table 2.

Table 2

Means and Standard Deviations of the MSPSS, SS-B, PSS, and OQ-45

Measure	Time 1 *M, SD*	Time 2 *M, SD*
MSPSS		
Family	5.28, 1.34	5.24, 1.40
Friends	5.08, 1.29	5.01, 1.35
Significant Other	5.16, 1.58	5.06, 1.61
Total	5.17, 1.13	5.10, 1.21
SS-B		
Family	203.94, 16.11	204.45, 22.31
Friends	180.56, 26.71	183.63, 27.55
Total	383.93, 38.82	390.39, 39.36
PSS		
Family	1.83, .64	1.80, .67
Friends	11.43, 1.91	11.21, 2.49
Total	24.85, 3.39	24.27, 4.57
OQ-45		
Symptom Distress	25.28, 12.53	25.31, 14.44
Interpersonal Relationships	9.66, 5.70	9.62, 5.82
Social Role Performance	10.62, 4.40	10.11, 4.67
Total	68.30, 22.99	55.39, 23.85

Within Construct Validity

Pearson correlation coefficient (r) was used to evaluate the degree of relationship between the MSPSS total score and the PSS total score and the SS-B total score in order to assess the relationship between the MSPSS and other measures of social support. The MSPSS total score was significantly correlated with the SS-B and PSS total scores ($r = .64, p < .001$; $r = .64, p < .001$, respectively). Also of interest is the correlation between the SS-B and the PSS to act as a reference point to what we might expect in terms of the correlation between the MSPSS and the other two scales. The SS-B and PSS were significantly correlated at $r = .59, p < .001$. The results suggest adequate convergent validity that the MSPSS is well correlated with other recognized measures of social support.

Pearson correlation coefficient (r) was also used to evaluate the relationships between the MSPSS subscales and the PSS subscales and the SS-B friends and family

subscales. The MSPSS Family subscale was significantly correlated with the PSS Family subscale and the SS-B Family subscale ($r = .61, p < .001$; $r = .55, p < .001$, respectively). The MSPSS Friends subscale was significantly correlated with the PSS Friends and the SS-B Friends subscales ($r = .56, p < .001$; $r = .69, p < .001$, respectively). The MSPSS Significant Other subscale was significantly correlated with the PSS Family subscale, but not the PSS Friends subscale ($r = .44, p < .001$; $r = .21, p = .09$, respectively). However, the same pattern of significant correlations did not emerge in regards to the MSPSS Significant Other subscale and the SS-B subscales of Family and Friends. These results produced significant correlations between the MSPSS Significant Other subscale and the SS-B Family and Friends subscales ($r = .33, p < .01$; $r = .42, p < .001$, respectively). Table 3 presents the correlation matrix between the different scales and subscales.

Table 3

Correlation Matrix Between the MSPSS, PSS, and SS-B Total and Subscales Scores

Measure	MSPSS – Fa (N = 1117)	MSPSS – Fr (N = 1125)	MSPSS – So (N = 1129)	MSPSS (N = 1121)	SS-B – Fa (N = 65)	SS-B – Fr (N = 67)
MSPSS - Fa	–					
MSPSS - Fr	.458***	–				
MSPSS - So	.412***	.867***	–			
MSPSS	.733***	.927***	.842***	–		
SS-B - Fa	.546***	.503***	.325**	.586***	–	
SS-B - Fr	.241*	.694***	.417***	.570***	.598***	–
SS-B	.405**	.664***	.385**	.640***	.833***	.905***
PSS - Fa	.614***	.518***	.438***	.681***	.584***	.407***
PSS - Fr	0.207	.559***	0.21	.456***	.272*	.485***
PSS	.498***	.581***	.340**	.643***	.509***	.459***

Table 3 (Continued)

Correlation Matrix Between the MSPSS, PSS, and SS-B Total and Subscales Scores

Measure	SS-B (N = 65)	PSS – Fa (N = 66)	PSS – Fr (N = 66)	PSS (N = 66)
SS-B	–			
PSS - Fa	.573***	–		
PSS - Fr	.454***	.315**	–	
PSS	.588***	.852***	.766***	–

Note. *$p < .05$; **$p < .01$; ***$p < .001$;

MSPSS = Multidimensional Scale of Perceived Social Support;

SS-B = Social Support Behaviors Scale; PSS = Perceived Social Support Scale;
Fr = Friends subscale; Fa = Family Subscale; So = Significant Other subscale.

Between Construct Validity

We assessed the measures between construct validity by relating it to a measure of psychological distress. We hypothesized that the PSS, the SS-B, and the MSPSS will produce similar high negative correlations with the Outcome Questionnaire (OQ-45). Pearson correlation coefficient (r) was used to obtain the results between the measures. It was found that both the MSPSS and the SS-B were significantly correlated with the OQ-45 ($r = -.41, p < .001$; $r = -.27, p < .05$, respectively), while the PSS was not ($r = -.15, p =$

.24). It is noteworthy that the MSPSS had the highest, if moderate, correlation with the OQ-45, suggesting that the between construct validity of this measure is adequate, if not superior, compared to the other social support measures in the study. Table 4 presents the results of the MSPSS, SS-B, and PSS total scores with the OQ-45 total score.

Table 4
Correlations and Significance Levels of the MSPSS, SS-B, and PSS with the OQ-45

	OQ-45			
Measure	IR (*r*, N)	SRP (*r*, N)	SD (*r*, N)	Total (*r*, N)
MSPSS – Total score				-.414***, 1119
Family	-.200, 66	-.172, 67	-.286*, 67	-.313**, 1115
Friends	-.541***, 66	-.279*, 67	-.355**, 67	-.379**, 1123
Significant Other	-.417***, 66	-.258*, 67	-.226, 67	-.304**, 1127
SS-B – Total score				-.265*, 66
PSS – Total score				-.147, 65

Note. *$p < .05$; **$p < .01$; ***$p < .001$; IR = Interpersonal Relationships subscale; SRP = Social Role Performance subscale; SD = Symptom Distress subscale

A Pearson correlation coefficient (r) was used to examine whether the MSPSS subscales of Family, Friends, and Significant Other would each generate a moderate to high negative correlation with the Interpersonal Relationships subscale of the OQ-45. It was further hypothesized that the MSPSS subscales will correlate less highly with the Social Role Performance subscale, and least highly with the Symptomatic Distress subscale of the OQ-45, but still demonstrates a moderate negative correlation.

The results only partially substantiated the hypotheses. The MSPSS subscales in relation to the Interpersonal Relationships subscale of the OQ-45 showed mixed results. The Friends subscale of the MSPSS demonstrated the highest correlation of $r = -.54$, $p < .001$. The Significant Other subscale of the MSPSS showed the next highest correlation

of $r = -.42, p < .001$, while the Family subscale of the MSPSS did not correlate significantly with the OQ-45 Interpersonal Relationships subscale ($r = -.20, p = .11$). With regards to how the MSPSS subscales correlated with the other OQ-45 subscales, the MSPSS-SO and MSPSS-Fr subscales correlated significantly with the OQ-45 Social Role Performance subscale ($r = -.26, p < .05$; $r = -.28, p < .05$, respectively). The MSPSS-Fa and OQ-45 Social Role Performance subscales were not significantly correlated ($r = -.17$, $p = .17$). The MSPSS-Fa and MSPSS-Fr subscales correlated significantly with the OQ-45 Symptom Distress subscale ($r = -.29, p < .05$; $r = -.36, p < .01$, respectively). The MSPSS-SO subscale was not significantly correlated with the OQ-45 Symptom Distress subscale ($r = -.23, p = .07$). Table 4 presents the results between the MSPSS and its subscales with the OQ-45 and its subscales.

Predictive Validity

We expect the relationship between the MSPSS and the OQ-45 to reflect the connection that exists between perceived social support and health described in the literature. That is, an inverse relationship should exist between psychological distress and social support. A linear regression was performed to test whether the MSPSS total scores at pre-treatment will be predictive of OQ-45 post-treatment total scores in the clinical group. The overall model significantly predicted therapy outcomes, $R^2 = .07$, $R^2_{adj} = .069$, $F(1, 1050) = 79.31, p < .001$. This model accounts for approximately 7% of the variance in psychological distress at posttreatment. The regression coefficient of the pretreatment social support scores is $\beta = -.265$, $t(1050) = -8.91, p < .001$. The results of the linear regression show a significant relationship, but small affect, between the social support pretreatment scores and its ability to predict therapy outcomes. This suggests

that those patients who begin therapy with a greater degree of perceived social support are more likely to experience less psychological distress by the end of therapy than those patients who begin therapy with less perceived social support.

We expect that scores in the nonclinical group would remain relatively stable from time one and time two on the MSPSS and OQ-45. Paired samples T-tests were performed on the MSPSS (time one and time two scores) and the OQ-45 (time one and time two scores) for both the nonclinical and clinical group to investigate whether there was a significant difference between how participants in the different groups changed on the MSPSS and the OQ-45. The results indicate no significant difference between the way the nonclinical participants changed on the MSPSS or the OQ-45 (t (66) = -1.111; p = .27; t (66) = .431; p = .67 respectively). In the clinical group we expect that scores will be indicative of greater pathology on the MSPSS from time one and time two at time of signal in the clinical group, as these participants are those who are not responding to therapy and are, by definition, worsening on the OQ-45. The results indicate no significant difference between pretreatment MSPSS scores and scores at time of signal (t (227) = 1.089; p = .28). This suggests that a patient's perceived social support is not deteriorating in reaction to a heightened level of distress as indicated by the significant increase in OQ-45 scores (i.e. signal cases). The results associated with the OQ-45 time one and time two scores were significantly different (t (288) = 13.404; $p < .05$) indicating a significant increase in psychological distress in signal cases.

Factor Analysis

We expect to extract three factors relating to the three subscales of the MSPSS. Specifically, we anticipate the Family subscale to consist of items 3, 4, 8, and 11, the

Friends subscale to be composed of items 6, 7, 9, and 12, and the Significant Other subscale to be fashioned by items 1, 2, 5, and 10.

Factor analysis was conducted to confirm the underlying structures that exist in the items of the MSPSS (see Table 5 for a description of the MSPSS items). A principal components analysis utilizing a varimax rotation identified three factors. Together these factors accounted for 79.7% of the variance. The factor rotation matrix is presented in Table 6. Items loaded strongly according to the designated subscales identified above (Family, Friends, and Significant Other).

Table 5
MSPSS Items

1. There is a special person who is around when I am in need.
2. There is a special person with whom I can share my joys and sorrows.
3. My family really tries to help me.
4. I get the emotional help and support I need from my family.
5. I have a special person who is a real source of comfort to me.
6. My friends really try to help me.
7. I can count on my friends when things go wrong.
8. I can talk about my problems with my family.
9. I have friends with whom I can share my joys and sorrows.
10. There is a special person in my life who cares about my feelings
11. My family is willing to help me make decisions.
12. I can talk about my problems with my friends.

Table 6

Factor Analysis Matrix with Varimax Rotation

MSPSS items	Factors		
	Significant Other	Friends	Family
1	.88	.28	.20
2	.87	.22	.17
5	.85	.30	.18
10	.84	.29	.17
6	.19	.85	.15
7	.31	.82	.19
9	.35	.82	.19
12	.24	.82	.18
3	.11	.17	.87
4	.24	.15	.86
11	.13	.14	.83
8	.16	.17	.81

Internal reliability of the MSPSS was measured using Cronbach's coefficient alpha. The coefficient alpha for the total score was .92. The coefficient alpha for the subscales of Family, Friends, and Significant Other were .89, .91, .94 respectively. These coefficient alphas suggest excellent internal reliability and complement the results from previous research (i.e. Zimet, Dahlem, Zimet, and Farley, 1988; Zimet, Powell, Farley, Werkman, and Berkoff, 1990; Dahlem, Zimet, and Walker, 1991).

Reliable Change Index

We calculated a cutoff score between the clinical (N=1054) and nonclinical (N=67) samples, using time one data, in order to generate a Reliable Change Index (RCI) and clinically significant change to increase interpretability of the measure. The equations and calculations that were used to obtain a cutoff score (C) and the reliable change index (RCI) for the MSPSS may be found on Table 7.

Table 7

Formulas for calculating the MSPSS cutoff score and the RCI

Cutoff Score:

$$\frac{[(SD_1)(Mean_2)] + [(SD_2)(Mean_1)]}{SD_1 + SD_2} = \frac{[(1.12)(6.15)] + [(.70)(5.10)]}{1.12 + .70} = 5.75$$

RCI:

1. S_E = Pooled SD$\sqrt{1-r_{xx}}$

$\sqrt{1-r_{xx}} = \sqrt{1-.92} = \sqrt{.08} = .28$

$$\text{Pooled SD} = \frac{[(N_1 - 1)(SD_1)] + [(N_2 - 1)(SD_2)]}{(N_1 - 1) + (N_2 - 1)} = \frac{[(1054 - 1)(1.12)] + [(67 - 1)(.70)]}{(1054 - 1) + (67 - 1)}$$

$$= \frac{1225.56}{1119} = 1.1 \qquad S_E = (1.1)(.28) = .31$$

2. $S_{diff} = \sqrt{(2)(S_E)^2} = \sqrt{2}(.31) = .79$
3. $RCI = (S_{diff})(1.96) = (.79)(1.96) = 1.5$

The means and standard deviations of the two samples (nonclinical and clinical) were used to determine the cutoff score. The RCI was calculated using the standard error (S_E) by taking the square root of 1-r_{xx}, where r_{xx} is the internal consistency of the MSPSS, and then multiplying this value by the pooled standard deviation of the two groups (nonclinical and clinical). Then the standard difference (S_{diff}) was calculated and multiplied by 1.96 to arrive at the final RCI score. Being contained in the 95% confidence interval provides assurance that the amount of change in reliable.

This produced a cutoff score of 5.75 indicating that those who score above this cutoff score have a perceived social support that more likely reflects a nonclinical population while those who score below this cutoff score have a perceived social support more similar to a clinical population. The RCI for the MSPSS is 1.5 indicating that participants' whose scores on the MSPSS change by 1.5 points indicates a reliable change in their perceived social support.

Discussion

Within Construct Validity

This hypothesis addressed the concern of the validity of the MSPSS as a measure of perceived social support. That is, we wanted to understand better how confident we are that the MSPSS is actually measuring the construct of perceived social support. This validity concern, when taken in conjunction with the feedback system as implemented by Lambert and colleagues (Lambert, Whipple, Smart, Vermeersch, Nielsen, and Hawkins, 2001; Lambert, Whipple, Vermeersch, Smart, Hawkins, Nielsen, and Goates, 2002), becomes an important issue since the MSPSS constitutes one of the Clinical Support Tools (CSTs) used to evaluate a patient's progress in therapy and suggest possible remedies to poor treatment outcome (Whipple, Lambert, Vermeersch, Smart, Nielsen, and Hawkins, 2003). From a broader perspective, and regardless of whether or not the clinician implements a feedback system or tracks therapy outcomes of his or her patients, the research informs us that perceived social support directly relates to a patient's reported severity of symptoms and can mediate stressful life events and the development of psychological symptoms (Monroe, Imhoff, Wise, and Harris, 1983). It further recommends that therapists identify what social support resources a patient already has in their current situation or community and utilize these resources to achieve a better treatment outcome (Bankoff and Howard, 1992; Evans, 1993).

The results suggested adequate convergent validity that the MSPSS is well correlated with other recognized measures of social support (i.e. SS-B and the PSS). On the subscale level, all three of the measures' Family subscales were well correlated as well as all three Friends' subscales indicating strong convergent validity of the MSPSS

with other social support measures at the subscale level. The Significant Other subscale of the MSPSS correlated significantly with the Family subscale of the PSS and both the Family and Friends subscales of the SS-B. This reflects the ambiguity extant in the research literature as to whether significant other is perceived as family or friend or if a significant other is understood better as a distinct construct separate from either friend or family as represented in the MSPSS. The research literature finds evidence to conceptualize a significant other as being distinct from groups of people, like a family or a group of friends, and as having its own set of unique relationship patterns and characteristics that are distinct from those found at the group level (Insko and Schopler, 1998). Incorporated into the conception of the self are the in-groups to which the individual belongs (Smith and Henry, 1996). Likewise, that same individual will have their relationship partner internalized and integrated into his or her own sense of self (Aron, Aron, Tudor, and Nelson, 1991).

A clinical advantage in using the MSPSS is the more specific information the clinician receives with the additional subscale of significant other. Having three subscales increases the interpretability of the measure and allows for a greater degree of specificity in terms of planning interventions to bolster a patient's social supports. This allows the treating clinician to understand better in what area the patient perceives the greatest deficit of social supports, stemming from family, friends, or a significant other.

Between Construct Validity

A well-developed research literature exists on the influence of social support on health (Cohen and Wallace, 1997; Orth-Gomer, Rosengren, and Wilhelmsen, 1993; Berkman, Leo-Summers, and Horowitz, 1992) and psychological well-being (Cohen and

Wills, 1985; Goerge, Blazer, Hughes, and Fowler, 1989; Wethington and Kessler, 1986). In fact, it has been estimated that an insufficiently integrated social support network is comparable to those health risks associated with cigarette smoking, high blood pressure, and obesity (House, Landis, and Umberson, 1988). Furthermore, a person who has a high degree of perceived social support interprets negative or harmful life events as less harmful (Lazarus, 1966; Moos and Billings, 1982; Cohen and McKay, 1984).

The results from this study demonstrate a meaningful inverse relationship between social support and psychological distress. As noted earlier, the MSPSS displayed an acceptable moderate relationship with the OQ-45 attesting not only to its clinical utility, but also to its ability to reflect accurately research findings that repeatedly manifest an inverse relationship between social support and psychological distress (Henderson, Byrne, Duncan-Jones, Adcock, Scott, and Steele, 1978; Unchino, Cacioppo, and Kiecolt-Glaser, 1996; Zlotnick, Shea, Pilkonis, Elkin, and Ryan, 1996). The clinical utility of a patient's perceived social support alluded to above is well articulated in the research literature (Compell, 1996; Kahn, Achter, and Shambaugh, 2001; Monroe, Imhoff, Wise, and Harris, 1983; Moos, 1990) and more specifically exemplified in the feedback system Lambert and colleagues apply to improving treatment (Lambert, Whipple, Smart, Vermeersch, Nielsen, and Hawkins, 2001; Lambert, Whipple, Vermeersch, Smart, Hawkins, Nielsen, and Goates, 2002). In order to improve their already established system of feeding back information to therapists about patient progress, they implemented Clinical Support Tools (CSTs) that are intended to be used with patients that are deteriorating in psychotherapy (Whipple, Lambert, Vermeersch, Smart, Nielsen, and Hawkins, 2003). The CSTs were chosen based on variables that the

empirical literature demonstrated to be most predictive of patient outcome. In conjunction with Lambert's (1992) estimate that 40% of therapy outcome variance is due to extratherapeutic factors, social support was understood as one of those important extratherapeutic factors.

In regards to the relationship between the MSPSS and the OQ-45 at the subscale level, the results showed mixed results. We expected that sources of perceived social support (i.e. MSPSS subscales of Family, Friends, and Significant Other) would correlate well with those subscales on the OQ-45 directly related to relationship issues (i.e. Interpersonal Relationships and Social Role Performance subscales). The mixed pattern that emerged between the measures subscales were the MSPSS Friends subscale being most highly correlated with the OQ-45 subscale of Interpersonal Relationships, then with Symptom Distress, and least highly with Social Role Performance. The MSPSS Family subscale was most highly correlated with the OQ-45 subscale of Symptom Distress, then with Interpersonal Relationships, and least highly with Social Role Performance (not all these correlations reached a level of significance; see Table 4). The pattern we predicted was found in the way the MSPSS – Significant Other subscale related to the OQ-45 subscales. The Significant Other subscale was most highly related to Interpersonal Relationships, then Social Role Performance, and finally with Symptom Distress.

It is important to note that the Family subscale of the MSPSS was only significantly correlated with the Symptom Distress subscale of the OQ-45 indicating that a person is likely to understand their family as a symptom of their distress that is not well related to interpersonal or social role issues. However, both Friends and Significant Other subscales of the MSPSS were considerably correlated with the Interpersonal

Relationships subscale of the OQ-45 suggesting that people view both friends and a significant other as a source of interpersonal distress. The clinical relevance of these subscale relationships become salient as a therapist attempts to piece together and understand how their patient understands their psychological distress and its relation to their perceived lack of social support.

Predictive Validity

The ability of the pretreatment MSPSS scores to predict posttreatment OQ-45 scores demonstrates the measures predictive ability in a clinical setting. This suggests that those patients that begin therapy with fewer perceived social supports are more likely to end treatment with a higher degree of psychological distress than those patients entering therapy with a higher perception of social support. This is congruent with previous research that directs therapists to implement interventions that will bolster or compensate for low levels of social support (Campbell, 1996; Moos, 1990). It may also suggest that those patients who begin treatment with low levels of perceived social support will require more treatment to attain a positive outcome than those patients who enter therapy with adequate perceived social support. In addition, using a relatively small 12-item measure we were able to account for seven percent of the variance associated with therapy outcome.

The stability of the relationship between the two constructs of perceived social support and psychological distress was well demonstrated in the nontreatment group. For these participants, there was no meaningful difference between how their perception of social support changed and how their level of psychological distress changed over time. In the clinical group we expected to find that those patients that were worsening or not

responding to therapy (i.e. signal cases), as manifested by a considerable increase in psychological distress, would also experience a significant deterioration of their perceived social support. However, it was found that patient's perception of their social support remained relatively stable while their psychological distress increased. This finding challenges the consistent inverse relationship between psychological health and social support. A possible explanation for this anomalous result is that patients who are at risk for treatment failure probably enter therapy with little or no perceived social support. Furthermore, since therapy has not had a beneficial affect on the patient, it is highly unlikely that the patient has made any gains in his or her social support. It may also be that the therapist is understood by the patient as a part of their social support system (Kahn, Achter, and Shambaugh, 2001) and since patients often recapitulate maladaptive relationship patterns with their therapist it is possible that the therapeutic alliance is also at risk. In other words, the patient is working hard at keeping the status-quo by continuing to construct their reality the way they have before. These explanations are offered as possibilities as we have no empirical data that directly relates to these observations.

Factor Analysis

The factor analysis confirms that people make clear distinctions between sources of social support: family, friends, and significant other. This finding is consistent with previous research results (Zimet, Dahlem, Zimet, and Farley, 1988; Zimet, Powell, Farley, Werkman, and Berkoff, 1990) and with research on other measures of social support that substantiate the distinction people make between friends and family (Procidano and Heller, 1983). Given the high correlation found between the MSPSS-Fr

and MSPSS-SO ($r = .867$; $p < .05$) it calls into question the three factor structure. However, the wording of the items may account for the large correlation found between these two subscales and may not necessarily indicate evidence against the already established three factor structure. The internal consistency of the MSPSS, which used Cronbach's alpha, provides support for earlier research on its internal reliability (Zimet et al., 1988; Zimet et al., 1990). Taken together, the factor analysis and the internal consistency of the MSPSS, provide the researcher and the clinician alike with confidence that the measure produces reliable data on perceived social support.

Cutoff Score and Reliable Change Index

One way of improving the interpretability of the MSPSS for the therapist is by calculating cutoff scores and providing a Reliable Change Index (RCI). Essentially this will provide the therapist with the ability to identify a clinically significant change in social support in their clients. Jacobson and Truax (1991) developed formulas for calculating a cutoff score and a RCI that we used to analyze clinical and normative data collected for the MSPSS. If the change in scores is by a certain amount in either a positive or a negative direction, then the therapist may consider the client as having made a "reliable change."

The cutoff score calculated for the MSPSS is 5.75 and the RCI is 1.5. Using Jacobson and Truax (1991) criteria that requires movement from a score typical of a clinical population to a score typical of a nonclinical population (Kendall, Marrs-Garcia, Nath, and Sheldrick, 1999) to determine the difference between a patient that has achieved an improvement or a recovery. When a patient's score reaches above the MSPSS's cutoff score the patient's functioning is similar to a nonclinical population level

of functioning at that point in time. Passing this cutoff (from dysfunctional to functional) is the second criterion posited by Jacobson and Truax (1991) as an indicator of clinically significant change. Patient's who show reliable change (i.e. MSPSS score increases by at least 1.5 points) and pass the cutoff (i.e. 5.75) are considered "recovered," while those who only show reliable change are considered "improved." The therapist will then be able to make an objective distinction between a "recovered" or "improved" patient in terms of their social support.

Limitations

Several limitations of the study are apparent. The nonclinical sample was limited to undergraduate students from a large private university, while the clinical sample participants were outpatients taken from the university counseling center. This necessarily places constraints on our ability to generalize the results and conclusions from this study to other types of populations (e.g. non-students or inpatient populations). Since we used archival data, we were limited to what variables were available on the data set. Because of this, the clinical group was lacking some measurements that would have been useful. For instance, we were not able to match the clinical group with the nonclinical group on some of the social support measures. We also needed to work around the timing of when some of the measures were administered to the clinical group (archival data) that we felt placed some limitations on our ability to more clearly answer our research questions. A final limitation was that the social support measures used to validate the MSPSS did not have a significant other subscale. Due to this limitation, we were not able to understand how well the MSPSS significant other subscale would relate to other significant other subscales. Consequently, we were not able to speak directly

about this important construct of social support, but instead only indirectly relate it to the other subscales available for comparison (i.e. Family and Friends).

Future Research

Directions for future research might include sampling from across a variety of populations to clarify how the constructs of perceived social support and psychological distress function in these other populations. More closely studying the relationship between perceived social support and psychological distress within a system of feedback would be beneficial. More specifically, Lambert's (2001) system of feedback has established several posttreatment categories and researching how perceived social support changes between those patients considered recovered, improved, experienced no change, or deteriorated through the course of treatment and how these posttreatment categories are related to psychological distress and perceived social support levels would be a valuable course of research.

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