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# Sensitivity to Change of the Behavior and Symptom Identification Scale (BASIS-32)

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# Sensitivity to Change of the Behavior and Symptom Identification Scale (BASIS-32)

by

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A Doctoral Project submitted in Partial Fulfillment
of the requirements for the degree of
Doctor of Psychology

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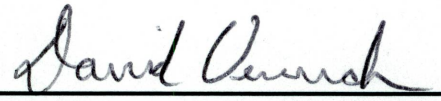
Each person whose signature appears below certifies that this doctoral project in his opinion is adequate, in scope and quality, as a doctoral project for the degree of Doctor of Psychology.



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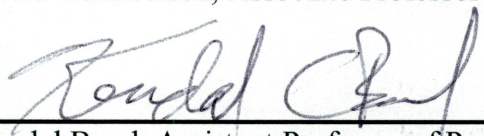

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Sensitivity to Change of the Behavior and
Symptom Identification Scale (BASIS-32)

by

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Doctor of Clinical Psychology, Graduate Program in Psychology
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*With the increased demand for evidence based mental health interventions, there has been an increased need for comprehensive ways to determine the validity of certain measures used to measure therapy effectiveness. The Behavior and Symptom Identification Scale (BASIS-32) is one of the most widely used measures for measuring therapy outcomes. This study was conducted on the BASIS-32 investigating the validity of the instrument, not only on the overall and subtest level, but also on the item level. This study is particular in that it also measured the validity of the instrument in being sensitive to client reported change over time. Results found the BASIS-32's total score, subtest's scores, and the majority of the items to have very meaningful and statistically significant sensitivity to measuring client change over time. Conclusions and further areas of development are discussed.*

# CHAPTER ONE

## Introduction

Increased health care costs over the past decade have led to dramatic changes and adaptations in the health care industry (Doerfler, Addis, & Moran, 2002; Vermeersch, ©managed health care. Among the many duties of managed care settings is to ensure that health care providers are distributing quality health care at lower costs (Mirin & Namerow, 1991; Brokowski, 1991; Vermeersch, 1998; Doerfler et al., 2002). Due to the increased demand for quality care and lower costs, managed care organizations have required that health care providers empirically support the effectiveness of their interventions (Barlow, 1996; Sederer & Dickey, 1996; Lambert, 1996). This demand has concurrently led to an increased demand for tools that are able to measure the effectiveness of one's treatment.

Psychotherapy outcome research has been one of the major fields that have answered the call for empirically supported outcomes. While psychotherapy outcome research has not had a major impact on clinical practice historically, the increased demand for empirically supported practice has helped to further integrate outcome assessment and clinical practice (Doerfler et al., 2002; Eisen & Dickey, 1996). One of the major challenges for outcome research has been the ability to accurately measure if, what, and when positive psychological changes have resulted from therapy (Vermeersch, 1998). Outcome measures designed to measure the effectiveness of certain therapeutic interventions over given periods of time can be one of the ways to assist in measuring client change (Lambert, 1983; Moses-Zirkes, 1993; Vermeersch, 1998).

One of the major needs of an outcome measure is the ability to track the change of an individual who is receiving psychotherapy over time. However, in many cases, clinicians have used psychological tests for this purpose that are not sensitive to change (Froyd, Lambert, & Froyd, 1996). The use of these measures to track change are often ineffective. Additionally, research has shown that many existing outcome measures were developed according to traditional item selection criteria (Collins & Cliff, 1990). This is important to note because the traditional item selection criteria do not include the ability to track change, but emphasize discrimination at a single point in time and moderate item difficulty (Nunnally & Bernstein, 1994). In fact, a large majority of psychological tests have been developed with the intention of measuring variables that are stable over time (Vermeersch, 1998).

More recently, researchers and clinicians alike have begun to take notice of the conflict that exists between theory and practice and efforts are being made so that outcome research can have meaningful clinical applications. The majority of the research conducted on an outcome measurement's ability to track change over time has focused on the total score, and in some limited cases, the subtest scores (Vermeersch, Lambert, & Burlingame, 2000; Jerrell, 2005). However, as the field of outcome research has developed, so have its theoretical and applicable depths. This has led researchers to develop methods that allow for outcome measures to be critiqued at the item, as well as subtest and total score level (Vermeersch, 1998; Vermeersch et al., 2000; Vermeersch, et al., 2004). This more in-depth method of measuring sensitivity to change has further lead researchers and clinicians to making more educated and informed decisions when it comes to outcome measure development and selection.

Historically, sensitivity to change has been defined in several different ways depending upon its context of use (DeKeyser & Pugh, 1991; Woods, 1998). However, in the case of psychotherapy outcome assessment, Hill and Lambert (2004) have defined sensitivity to change as the degree to which an instrument accurately reflects client changes that occur following participation in therapy. With regards to psychological measure development, it has been noted that validity and reliability are sufficient to demonstrate usefulness, however in the case of evaluative purposes (e.g., outcome measurement) it has been distinguished that sensitivity to change is additionally needed (Vermeersch et al., 2000).

As far as outcome assessment is concerned, Lambert and Hill (1994) distinguished test/retest reliability as being a particular important part of the picture because outcome assessment generally calls for the instrument to be administered prior to treatment, following intervention, and at follow up. Based on these measurements a change score or estimate of change is determined. It is important to note that this estimate not only reflects change in an individual's score, but also reflects random measurement error changes (Nunally, 1978). If an outcome measure has low reliability it can impact the measure in two separate ways. First off, the overall reliability of the measure will be called into question (Vermeersch, 1998). Secondly, the estimate of change reliability will be called into question as well, majorily crippling the use of the outcome measure.

Previously mentioned, the validity of an instrument is very important as well. Validity refers to the ability of a measure to measure what it purports to measure. Nunnally & Bernstein (1994) distinguish between three kinds of validity: construct,

criterion, and content validity. With regards to sensitivity to change in outcome assessment, the ability of an instrument to measure what it purports to measure (change of time) is of most importance. And as Vermeersch et al. (2000) note, change sensitivity can best be conceptualized as an issue of construct validity. Remarking further, Kirshner and Guyatt (1985) state that one of the best ways to demonstrate construct validity is through longitudinal within-subject changes on the measure of interest after an effective intervention.

Noted above, as the demand for empirically supported interventions has grown in the health care industry so has the amount of empirically supported research supporting the use of quality outcome measures. Over the last decade the sensitivity to change of an outcome measure has become even more important, and researchers have began to develop standards by which to measure the sensitivity to change. However, the large majority of these studies critique the measures at the total score and/or subscale level.

A significantly less amount of research has been conducted evaluating the outcome measures on the item level. And as Vermeersch et al. (2004) note, this can be particularly important for several reasons. First off, multitrait scales are often used in outcome research. Now, while this can lend several advantages, because it allows assessment of a wide variety of symptoms, it can also be a disadvantage because it can affect the sensitivity to change by containing items that are relevant for some individuals and irrelevant for others. Secondly, some measures contain items that offer a restricted range of responses or are categorically arranged. This is critical because items with such characteristics create units that are too gross to be sensitive to change (Lipsey, 1990). Third, measures may contain instructions that are not advantageous to tracking change.

For example, the individual may be asked to track how they have felt over a given six month period while the interventions they are receiving take place on a weekly or bi-monthly basis. Fourth, items may assess variables, domains, and areas of interest that are relatively stable over time. And lastly, measures may contain items that are affected by ceiling and floor effects. This can be a critical error because it does not give the item a meaningful amount of variance from which to detect growth or deterioration on the construct in question.

Becoming more aware of the challenges present in measuring sensitivity to change, researchers have worked to develop standards to determine a measures sensitivity to change (Guyatt, 1988; Meier, 1997; Tryon, 1991; Vermeersch et al., 2004). Tryon (1991) noted three criteria for the selection of items sensitive to change: (a) items should show change resulting from the presence of an intervention (b) items should not change when respondents are exposed to the control condition, and (c) changes in scores from preintervention to postintervention should not be attributable to measurement error or nonintervention factors.

In an effort to further amalgamate sensitivity to change literature, Vermeersch et al. (2000) suggested two criteria for determining the change sensitivity of an outcome measure: (a) client change on an item, subscale, or total score of an outcome measure should occur in the theoretically proposed direction and (b) the change observes on an item, subscale, or total score of an outcome measure indicated significantly more improvement in treated than in untreated individuals. And as Vermeersch et al. (2004) note, it would be ideal if these criteria were used in the initial test construction phase of an outcome measure. However, they can still be used in the evaluation or critique of an

existing outcome measure. It is not being suggested that these criteria be the only means used in constructing and/or evaluating an outcome measure. Nevertheless, one should consider a sensitivity to change analysis as critically important in the process.

A separate, but closely related, area of outcome research has focused on how a client's reported symptoms could influence the client's progress of change. Several studies have looked at how a client's diagnoses plays a part in the client's recovery. In these studies several meaningful relationships have been found to play a part in the client's progress. One study found that clients with a depression or anxiety related diagnosis reported significant improvement sooner than clients with a borderline-psychotic diagnosis (Howard, Kopta, Krause, & Orlinsky, 1986). A more recent study also reported a similar interaction between symptomology and rate of improvement (Lutz, Lowry, Kopta, Einstein, & Howard, 2001). And lastly, another study separated symptomology into chronic and acute time frames, finding that patients with more acute symptomatic experiences reported the highest percentage of recovery compared to chronic and characterological symptoms (Kopta, Howard, Lowry, & Beutler, 1994).

This has meaningful application to the study of change sensitivity for a couple reasons. First off, the diagnosis of a client could influence an outcome measurement tool's ability to be sensitive to change if the diagnosis is of a more chronic nature. Secondly, different facilities and studies could find very different results regarding sensitivity to change if there is a significant difference in their patient populations. And lastly, if these dynamics show to exist in subsequent studies, researchers could come to expect these results and find ways to account for and make improvements to their

outcome measures accounting for differences in client symptomology. It is a possibility that would be sure to improve the field of outcome measurement.

With the goal of allowing an outcome measure to be critiqued at the item, subscale, and total score level, Vermeersch (1998) developed a method that allows for such a sensitivity to change analysis to be conducted. With this method being a relatively new design, it has not yet received much application or use. In fact, the focus of this method has centrally been used on the Outcome Questionnaire (OQ; Lambert et al., 1996). However, the generalizability and broad application of the OQ has meant that the sensitivity to change of the OQ has been tested in several different patient and non-patient populations. The sensitivity to change studies across the various settings and populations has helped to further support the use and application of the OQ. In addition, the method used by Vermeersch et al. (2000) has meant that the OQ's sensitivity to change could be analyzed at the item, subscale, and total score level, thus further documenting the validity and reliability of the OQ, especially the construct validity, which can be so important for an outcome measure.

As, Doerfler et al. (2002) note, there are two outcome measures that appear to be the most promising with regards to psychometric qualities and clinical utility, the OQ and the BASIS-32. The OQ has been shown to be reliable and valid for use as a clinical instrument of client distress (Lambert, Burlingame, & Umphress, 1996; Umphress et al., 1997). In addition, it has been shown to be sensitive to change with outpatient psychotherapy, psychiatric hospitalization, and university counseling centers (Lambert, Okiishi, Finch, & Johnson, 1998; Moran, Doerfler, & Scherz, 2000; Vermeersch et al., 2004).

The Behavioral and Symptom Identification Scale (BASIS-32), originally designed to assess social functioning and symptoms in psychiatric patients, is another example of a widely used outcome measure (Eisen, Dill, & Grob, 1994) that has been used in various outpatient settings (Eisen and Culhane, 1999). The majority of research that assesses the validity and reliability of the BASIS-32 has focused on its factor structure and construct validity (Doerfler et al., 2002; Eisen et al., 1999). While research and confirmatory factor analysis has generally supported the original factor structure of the BASIS-32, findings have also found the impulsive and addictive behavior and psychosis subscales to have low item-total correlations (Eisen et al., 1999).

With regards to sensitivity to change, the BASIS-32 subscales have been found to be sensitive to change during short hospitalizations and brief outpatient treatment (Hoffman, Capelli, & Mastrianni, 1997; Russo, Roy-Byrne, & Jaffe, 1997; Eisen et al., 1999). However, research with outpatient populations examining the reliability, validity, and sensitivity to change is sparse, and initial findings are indicating that patient characteristics and/or treatment settings may affect the psychometric properties of the BASIS-32 (Eisen et al., 1999). For example, Jerrell (2005), studying the sensitivity to change in an behavioral medicine in-patient facility, found the Psychosis and Impulsive/Addictive Behavior subscales and total score level to be significantly less reliable over time compared to the Daily Living Skills, Depression/Anxiety, and Relation to Self/Others subscales. Furthermore, these studies have only gone so far as to test the sensitivity to change of the BASIS-32 on the subscale and total score level. There appears to be very little, in any, research that examines the sensitivity to change of the BASIS-32 at the item level. As demonstrated earlier, an outcome measurement's

sensitivity to change on the item level can have a significant impact upon the validity of the whole measure.

In addition, as Vermeersch et al. (2000) note, development of effective outcome measures require that researchers remember the primary purpose of their instruments, to measure change within the individual. Then, it is necessary to consider the sensitivity to change of an item as a criterion for appraising that item. If researchers include item change sensitivity as a primary criterion for an outcome measure they will not only be able to build more effective measure, but also will be able to more effectively evaluate outcome measures as well.

The goal of this study is to take the model that was proposed by Vermeersch (1998), which offered a model by which to allow a psychological measure's change to sensitivity to be analyzed at the subscale, total score, and item level. While this model has primarily been utilized on the OQ with the university counseling center population, it is the intent of this paper to apply this model to the BASIS-32 with use in an inpatient psychiatric hospital population. In addition, there are no indications that the BASIS-32 has been analyzed on the item level. With researchers calling for further analysis of the BASIS-32, this study should add further evaluation and appraisal of the BASIS-32's sensitivity to change not only on the subscale and total score level but also on the item level (Eisen et al., 1999; Doerfler et al., 2002).

With regards to the theoretical model proposed by Vermeersch et al. (2000), the goal of this study is to use those criteria with some changes. As mentioned previously, his first criteria states that sensitivity to change is considered valid if patient change is in the theoretically proposed direction. The second criteria states that the slope estimates

for the patient population indicate more significant change than the nonpatient population. The theoretical change proposed by this study is, rather than have comparisons between patient and nonpatient populations, to compare patient populations against a change score of zero. The assumption made by this author is that by comparing to a nonpatient sample, one is generally assuming that the nonpatient population will show no change, or at least any meaningful or clinically significant change, which would statistically be represented as a change score of zero. Thus, to save time, money, and resources, this author is going to assume that rather than collect the nonpatient data, assuming a change score of zero, or no significant change, will accomplish the same goal with regards to statistical validity. Thus, the modified second criteria proposed by this study will be: the change observes on an item, subscale, or total score of an outcome measure indicated significant improvement in treated individuals when compared to a change score of zero.

Therefore, working from the model proposed by Vermeersch et al. (2000) with this study, item sensitivity to change will judged as being valid if two criteria are met: (a) patient change of an item will occur in the theoretically proposed direction (i.e. the patient should improve over the course of treatment); (b) the change score estimates for the individual items will suggest marked improvement in treated individuals when compared to a change score of zero. Carrying out a study with these criteria should aid in the further investigation of the BASIS-32. If certain items are found to not be too sensitive to change then it will provide the opportunity for their utility to be discussed. Ultimately, this method could aid in further solidifying the construct validity and revision of the BASIS-32.

Therefore, the hypotheses for this paper are as follows:

*Hypothesis 1*:

a. The total score of the BASIS-32 will meet both criteria for change sensitivity.

b. Each of the subscales will meet both criteria for change sensitivity, with the depression and anxiety, daily living and role functioning, and relation to self and others as being the most sensitive to change, followed by the impulsive and addictive behavior and psychosis subscales.

c. The vast majority of items will meet both criteria for change sensitivity. By evaluating the sensitivity to change of individual BASIS-32 items, those that are significantly more sensitive to change in inpatient psychiatric patients can be identified, while those that lack sensitivity to change can be evaluated regarding their utility in measuring change in inpatient psychiatric patients.

*Hypothesis 2:*

a. Subscales based on acute symptomatic experience, as opposed to chronic/long-term symptoms, will be more sensitive to change over time when compared across the entire hospital patient sample. For the purposes of this study, the depression/anxiety, relation to self/others, and daily living skills refer to acute symptomatic experience, while the psychosis and impulsive/addictive behaviors subscales refer to chronic/long-term symptoms.

b. The vast majority of items based on acute symptomology, as opposed to chronic symptomology, will be more sensitive to change over time when compared across the whole hospital patient sample.

*Hypothesis 3:*

a. Subscales associated with the symptomology of the unit will be more sensitive to change over time when compared to other subscales. It was assumed that the Impulsive/Addictive would be most sensitive to the Adult Chemical Dependency (Adult CD) unit and therefore the greatest sensitivity of change would be reported when compared to other units in the hospital. Therefore, the remainder of the subscales, Psychosis, Depression/Anxiety, Relation to Self/Others, and Daily Living Skills are most sensitive to the Adult Unit and will demonstrate the greatest sensitivity to change when compared to the other units.

b. While the vast majority of items associated with the symptomology of the unit will be more sensitive to change over time when compared to the other items, the vast majority of the individual items' sensitivity will be most sensitive to the Adult Unit. Due to the specific associations of some items with the different units in the hospital, several individual items are hypothesized to be most sensitive to units other than the Adult unit. Items 28 and 29 will be most sensitive to the Adult CD unit, and item 4 will be most sensitive to the Adolescent unit. Therefore the remaining 29 items will be most sensitive to the Adult unit.

It is of import to note that as Vermeersch et al. (2004) noted with regards to the OQ, that the emphasis placed on the items does not mean that the items could be used to measure outcomes; the same can be said about the BASIS-32. Implementing such a

strategy could decrease some of the traditional psychometric properties of the BASIS-32. Rather, this paper assumes that the individual items of the BASIS-32 are the foundational elements for the subscales and total score. Consequently, such an evaluation should only aid in improving not just the individual items of the BASIS-32 but the subscales and total score as well.

# CHAPTER TWO

## Methods

### *Participants*

The treated (experimental) sample was taken from an archival database. The participants from the treated sample were patients at a local inpatient psychiatric hospital. The hospital contains 5 different programs (senior, adult, adolescent, partial hospitalization, and an adult chemical dependency program). The database indicates that the number of patients given the BASIS-32 are approximately 593 overall with 166 from the adolescent unit, 29 from the senior, 117 from the adult chemical dependency, 256 from the adult, and 23 from the partial hospitalizilation. The clients received individual and group psychotherapy from licensed psychologists, licensed psychiatrists, postdoctoral psychologists, pre-doctoral psychology interns, and graduate psychology students. Depending on the program of enrollment, the patients may have an array of diagnoses and conditions. The expected mean number of BASIS-32 administrations will be 2.0 with the general procedure of the hospital calling for an administration at admission and again at discharge. Patients who were not administered the BASIS-32 a minimum of two times will be excluded from data analysis due to constraints of statistical theory associated with the data analysis. The demographic data of the archival sample is not known, although it is assumed that it will be representative of an inpatient psychiatric population.

*Materials*

The BASIS-32 is designed to assess the client's perspective on his or her level of difficulty with a broad range of symptoms and problems over the past week. Difficulty is rated on a 5-point scale as follows: 0 = no difficulty, 1 = a little difficulty, 2 = moderate difficulty, 3 = quite a bit of difficulty, 4 = extreme difficulty. The 32 items generate a total score and five subscale scores: relation to self/others, daily living/role functioning, depression/anxiety, impulsive/addictive behavior, and psychosis. The BASIS-32 originally was tested on a sample of patients receiving inpatient hospital care for mental health and/or substance abuse. Internal consistency of the subscales ranged from .63 to .80, with full-scale internal consistency of .89. Test-retest reliability ranged from .65 to .81 for the five subscales. Concurrent and discriminate validity analyses indicated that BASIS-32 ratings successfully discriminated patients with different diagnoses, employment statuses, and rehospitalization statuses (Eisen & Dill, 1994).

*Procedure*

Treated participants were administered the BASIS-32 on admission to the specified program and again at discharge from their program. All treated participants were given the BASIS-32 on a minimum of two sessions.

*Data Analysis*

The statistics for this project were computed using the independent samples t-test procedure in SPSS (SPSS, 1999), which is a statistical analysis that allows the variance between and across groups to analyzed. By using independent samples t-tests it allowed

for several things to take place statistically that other statistical procedures may not offer as easily and clearly. First off, using an independent samples t-test allows the means of the two different data points to be analyzed separately, producing means, standard deviations, and statistical significance scores. Then, it also produces the same for the second data point. Subsequently, these means can be compared to see if the BASIS-32, on the total, subscale, and item level, is capable of recognizing a statistically significant difference. Secondly, by using admission scores separately from discharge scores it removes differences among groups at entry, thus subsequent comparisons will test the differences in residual discharge scores. Thirdly, the independent samples t-test procedure allows the BASIS-32 data to be analyzed at the item, total, and sub-scale level, which is very important to the theoretical implications of this study.

Before carrying out any statistics any items that were reverse scored were changed accordingly so that an increase in score will indicate an increase in pathology, and a decrease in score will indicate a decrease in pathology. Data analysis provided a mean, standard deviation, t-value, statistical significance score, and effect size (Cohen's D). The calculation of the mean, and standard deviation were performed in order to provide a context in which to view the change score for the different items, subscales, or total score. The obtained t-value represents the average rate of change and is the primary indication of change (change score). In addition, an item, subscale, or total score was judged as being sensitive to change if (a) the obtained item change score (rate of change) was positive; and (b) the amount of change is significantly greater in patient samples when compared to zero. And lastly, effects sizes were calculated for each of the items, subscales, and total score. In speaking of the magnitude of effect sizes, Cohen (1998)

described d=0.2 as small, d= 0.5 as medium, and d=0.8 as large. These descriptions of magnitude will also be used in classifying the magnitude of the effect sizes found in the results.

With regards to testing the individual hypotheses, these procedures were carried out:

*Hypothesis 1*:

*a.* The change score of the total score of the BASIS-32 was determined for the patient sample and then checked to see if they met the two criteria for change sensitivity (a) the change happens in the theoretically proposed direction, meaning the client improved over time, and (b) when compared to a change score of zero, the change score for the patient sample differed significantly from zero on the total score level. Effect sizes were also taken into account.

*b.* The change score of the separate subscales was calculated for the patient sample and checked to see if they met the two criteria for change sensitivity. Once it was determined whether the subscales meet the criteria for change sensitivity, the change score of the individual subscales was compared to see if they fell in the order theorized (the depression and anxiety, daily living and role functioning, and relation to self and others will be the most sensitive to change, followed by the impulsive and addictive behavior and psychosis subscales). Effect sizes were also taken into account.

*c.* The change score for the individual items were calculated for the patient sample to see if they met the two criteria for change sensitivity, thus supporting or not supporting the hypothesis. After such conclusions are made,

suggestions about the utility of the items were then made. Effect sizes were also taken into account.

*Hypothesis 2:*

*a.* The change score of the subscales based on acute symptomology were calculated for the patient sample to see if they are more sensitive over time compared to the subscales based on chronic symptomatic factors, thus supporting or not supporting the hypothesis. Effect sizes were also taken into account.

*b.* The change score of the items based on acute symptomology were calculated for the patient sample to see if they are more sensitive over time compared to the items based on chronic symptomatic factors, thus supporting or not supporting the hypothesis. Effect sizes were also taken into account.

*Hypothesis 3:*

*a.* The change score of the subscales associated with the symptomology of the unit were calculated to see if they are more sensitive over time compared to the subscales not as associated with the symptomology of the unit, thus supporting or not supporting the hypothesis. Effect sizes were also taken into account.

*b.* The change score of the items associated with the symptomology of the unit were calculated to see if they are more sensitive over time compared to the

items no as associated with the symptomology of the unit, thus supporting or not supporting the hypothesis. Effect sizes were also taken into account.

Again, the goal of this study was to gain a better understanding not only of the validity of the BASIS-32 on the total, subscale, and item level, but also of how the BASIS-32's validity responds to patient population changes. With the above analysis being conducted further insight can be made in that direction.

Table 1

Pretreatment means, Post Treatment Means, Change Scores, T Values, and Effect sizes of the Total Score, 5 Subscales, and all 32 items from the BASIS-32.

| Total Score, Subscales, and Items | Pre. Mean | Post Mean | Mean Change | T Value | Eff. Sizes |
|---|---|---|---|---|---|
| Total Score | 49.41 | 24.80 | 24.61 | 22.58* | 0.98 |
| Impulsive/Addictive Behaviors (IA) | 6.73 | 2.79 | 3.94 | 17.51* | 0.83 |
| Depression/Anxiety (DA) | 12.58 | 6.00 | 6.62 | 24.37* | 1.07 |
| Daily Living Skills (DL) | 14.71 | 8.07 | 6.70 | 18.35* | 0.79 |
| Psychosis (PS) | 3.35 | 1.52 | 1.83 | 11.99* | 0.56 |
| Relation to Self/Others RS) | 12.05 | 6.44 | 5.61 | 18.59* | 0.83 |
| | | | | | |
| 19. Physical Symptoms (DA) | 2.13 | 0.98 | 1.15 | 18.31* | 0.84 |
| 17. Depression, hopelessness (DA) | 2.38 | 1.06 | 1.32 | 18.17* | 0.89 |
| 15. Lack of Self-confidence, feeling bad about yourself (RS) | 1.99 | 1.16 | 1.11 | 17.60* | 0.8 |
| 20. Fear, anxiety, or panic (DA) | 2.03 | 0.97 | 1.07 | 17.54* | 0.81 |
| 9. Isolation or feelings of loneliness (DA) | 2.16 | 1.09 | 1.08 | 16.97* | 0.78 |
| 32. Feeling satisfaction with you life (DL) | 2.22 | 1.08 | 1.15 | 16.65* | 0.83 |
| 18. Suicidal feelings or behaviors (DA) | 1.54 | 0.42 | 1.12 | 16.30* | 0.87 |
| 16. Apathy, lack of interests in things (DL) | 2.26 | 1.00 | 1.00 | 15.59* | 0.73 |
| 25. Mood swings, unstable moods (IA) | 1.69 | 0.72 | 0.97 | 15.73* | 0.77 |
| 21. Confusion, concentration, memory (DL) | 1.80 | 0.93 | 0.87 | 14.87* | 0.67 |
| 1. Managing day-to-day life (DL) | 1.68 | 0.83 | 0.85 | 14.46* | 0.59 |
| 14. Goals or direction in life (RS) | 1.80 | 0.92 | 0.88 | 14.38* | 0.66 |
| 12. Recognizing and expression emotions appropriately (RS) | 1.85 | 0.97 | 0.89 | 13.75* | 0.69 |
| 6. Adjusting to major life stressors (DA) | 2.35 | 1.48 | 0.88 | 13.01* | 0.64 |
| 7. Relationships with family members (RS) | 1.69 | 0.92 | 0.78 | 13.00* | 0.61 |
| 2. Household responsbilities (DL) | 1.57 | 0.83 | 0.75 | 12.92* | 0.59 |
| 10. Being able to feel close to others (RS) | 1.77 | 0.92 | 0.86 | 12.34* | 0.6 |
| 30. Controlling temper, outbursts of anger, violence (IA) | 1.24 | 0.55 | 0.69 | 12.34* | 0.59 |
| 22. Disturbing or unreal thoughts or beliefs (PS) | 1.16 | 0.45 | 0.71 | 12.23* | 0.59 |
| 11. Being realistic about yourself or others (11) | 1.59 | 0.90 | 0.70 | 11.44* | 0.56 |
| 26. Uncontrollable, compulsive behavior (IA) | 1.12 | 0.44 | 0.68 | 11.40* | 0.58 |
| 5. Leisure time or recreational activities (DL) | 1.49 | 0.80 | 0.70 | 11.34* | 0.53 |
| 28. Drinking alcoholic beverages (IA) | 1.05 | 0.41 | 0.64 | 10.91* | 0.5 |
| 13. Developing independence, autonomy (DL) | 1.38 | 0.81 | 0.59 | 9.69* | 0.46 |
| 29. Taking illegal drugs, misusing drugs (IA) | 0.83 | 0.32 | 0.51 | 9.28* | 0.45 |
| 24. Manic, bizarre behavior (PS) | 0.85 | 0.38 | 0.47 | 8.82* | 0.44 |
| 31. Impulsive, illegal or reckless behavior (IA) | 0.80 | 0.35 | 0.45 | 8.60* | 0.43 |
| 8. Getting along with people outside of the family (RS) | 1.11 | 0.66 | 0.45 | 8.32* | 0.39 |
| 23. Hearing voices, seeing things (PS) | 0.64 | 0.28 | 0.37 | 7.42* | 0.36 |
| 3. Work (DL) | 1.46 | 1.00 | 0.47 | 7.15* | 0.33 |
| 27. Sexual activity or preoccupation (PS) | 0.69 | 0.41 | 0.28 | 5.50* | 0.26 |
| 4. School (DL) | 1.13 | 0.80 | 0.33 | 5.33* | 0.25 |

* Significance level equals <.001

Looking at section one of hypothesis two, results calculated for the subscales produced t-values of 24.37 for the Depression/Anxiety Subscale, 18.59 for the Relation to Self/Others, 18.35 for the Daily Living Skills, 17.51 for Impulsive/Addictive Behaviors, and 11.99 for the Psychosis subscale. It was hypothesized the subscales based on acute symptomology (Depression/Anxiety, Relation to Self/Others, and Daily Living Skills) would show the greatest sensitivity to change followed by subscales based on chronic symptomatic factors (Impulsive/Addictive Behaviors and Psychosis). Initial data analysis of these subscales produced results exact to what was hypothesized. The Depression/Anxiety scale was the most sensitive to change, followed by Relation to Self/Others, Daily Living Skills, Impulsive Addictive Behaviors, and Psychosis. These results demonstrate that the subscales, theorized by the author to be linked to acute symptomatic experience, were more sensitive to change while the factors based on chronic/long-term symptomology were less sensitive to change. Results can be found above in Table 1.

The second section of hypothesis two looked at the sensitivity of individual items associated with acute symptomology as compared to more chronic symptomology. The individual association of each item was based on what subscale it was part of. Thus, items associated with the Depression/Anxiety, Relation to Self/Others, and Daily Living Skills subscales were assumed to be more sensitive to change compared to the items from the Impulsive/Addictive and Psychosis subscales. As predicted, the vast majority of items associated with acute symptomology were found to be more sensitive to change when compared to items associated with chronic symptoms. An example of this is, the item found to be the most sensitive to change was item 17. Depression, hopelessness with

a change score of 1.32 and t-value of 18.17. The first item associated with chronic symptomology, and ninth overall, was item 25. Mood swings, unstable moods with a change score of .97 and t-value of 15.73. A summary of the results can be found in Table 1. In fact, when the items were looked at individually, 16 of the 17 items most sensitive to change were associated with acute symptoms.

Hypothesis three focused on the sensitivity to change of the subscales and individual items when compared to the symptomology of the unit. With regards to the subscales, all five of the subscales were found to be most sensitive to the Adult unit (Impulsive/Addictive - 12.06, Depression/Anxiety – 18.37, Daily Living Skills – 14.87, Psychosis – 2.33, and Relation to Self/Others – 13.62). While the Impulsive/Addictive Behaviors subscale was hypothesized to be most sensitive to the Adult CD unit, the findings did not support it. For a detailed breakdown of how the subscales ranked in sensitivity according to the units please see the Appendix.

Additionally, it was expected the majority of the individual items would follow the pattern set by the subscales with regards to sensitivity of change, with the exception of the items specifically mentioned. Initial data analyses found the hypothesized 29 items to be most sensitive to the Adult unit. In addition, items 28 and 29, with t-values of 9.30 and 5.92, were most sensitive to the Adult CD unit, and item 4 with a t-value of 7.20 was most sensitive to the Adolescent unit.

# CHAPTER FOUR

## Discussion

Before the details of the study are addressed, it is important to speak to the findings as related to the change sensitivity of the BASIS-32 on the total score, subscale, and item levels. As seen in Table 1, all three levels of the BASIS-32 met the first criteria for sensitivity to change, meaning that data results reported a positive change over time. In addition, the total score, subscales, and individual items not only were able to demonstrate sensitivity to change, but also they were able to demonstrate a significant change when compared to a change score of zero. It is important to note that not only did they meet the criteria, but also, they did so with substantial t-values and effect sizes, the t-value of the least sensitive item being 5.33 with an effect size of .25.

Looking more in depth at the findings, it is interesting to notice the patterns that took place when the data was broken down according to the individual subscales and the type of symptomology they were attempting to measure. For example, data indicates that the Depression/Anxiety, Relation to Self/Others, and Daily Living Skills subscales were the most sensitive to items pulling for acute symptoms, while the Psychosis and Impulsive/Addictive Behavior subscales were based on symptoms associated with a longer span of influence. It would make sense for the subscales associated with more acute symptomology to show greater change sensitivity, as the patients are more likely to report a greater reduction in acute symptomology during their stay at the hospital.

Likewise, one would also expect the items associated with more long-term symptoms to show a lesser amount of significant change during their stay at the hospital. The results from the individual items when compared according to type of symptomology

also followed quite closely to the expected outcome, as would be expected based on the high t-values and effect sizes of the subscales. While it is not recommended that the individual items be used to measure symptom change and outcome, the obtained values being so high and significant can speak to the overall utility and accuracy of the BASIS-32 as an outcome measurement tool.

Understanding a client's reported symptoms and diagnosis has very meaningful application to the study of change sensitivity for a couple reasons. First off, the diagnosis of a client could influence an outcome measurement tool's ability to be sensitive to change if the diagnosis is of a more chronic nature. Secondly, different facilities and studies could find very different results regarding sensitivity to change if there is a significant difference in their patient populations. And lastly, if these dynamics show to exist in subsequent studies, researchers could come to expect these results and find ways to account for and make improvements to their outcome measures accounting for differences in client symptomology. With these expectations, they would adapt their practice and research to further test and explore the relationship of a client's symptomatic experience with an outcome measurement's change sensitivity.

It should be noted at this junction, the utility of the data pool from the Senior and Partial Hospitalization units is very week, most notably due to the amount of data collected from each pool. For example, the number of clients from each unit was: 166 (Adolescent), 29 (Senior), 118 (Adult CD), 257 (Adult), and 23 (Partial). The low n in the Senior and Partial Units do not really allow theorized or practical application regarding the numbers. In fact, on many of the items, the data from the two units reported negative change scores, small t-values, and/or not significant results. Thus, the

items did not meet the criteria for sensitivity to change. These findings further spoke to the lack of applicability of the data from these units. As the author was looking at the data before running the analysis, the assumption was these units would not produce significant results due to their low n. Thus, it was not surprising to see the findings reported as such. Therefore, the comparison of the individual items broken down by unit for all practical purposes took place between three units, the Adult, Adult CD, and Adolescent.

The final analysis of the data looked at the sensitivity of the BASIS-32 when the data is broken down according to the symptomology of each unit. Based on the names of the subscales, utility of the items, and the potential limits of the data pool, it was assumed that the Impulsive/Addictive Behavior subscale would be most associated with the Adult Chemical Dependency (Adult CD) unit and therefore the greatest amount and sensitivity of change would be reported when compared to other units in the hospital. Additionally, it was assumed the Psychosis, Relation to Self/Others, Daily Living Skills, and Depression/Anxiety subscales are most associated with the Adult unit and will demonstrate the greatest amount and sensitivity to change when compared to the other units. As mentioned in the results, it was found that all five of the subscales were most sensitive to the Adult unit. The hypothesized sensitivity between the Adult CD unit and the Impulsive/Addictive unit was not supported.

The most likely explanation for this finding is due to an incorrect hypothesis based on the name of the subscale. Upon further analysis of the items in the Impulsive/Addictive behaviors subscale, there are maybe two items with singular application to the Adult CD unit, or a similar unit. Meaning, the majority of the

remaining items in the Impulsive/Addictive Behaviors subscale are very possibly going to be selected by patients on units others than the Adult CD unit. And lastly, another possible explanation for the incorrect hypothesis was an incorrect labeling of the Impulsive/Addictive Behaviors subscale by the creators of the BASIS-32. A more precise and in depth study of the constructs contributing to this subscale could produce a more direct label.

When looking at the breakdown of the individual items according to units, the findings were not as clear cut and simple as initial analyses would suggest. While the hypothesized relationship of the items and units with regards to sensitivity was upheld, there is still a wealth of information that can be gained from further analysis. For example, in the process of determining the sensitivity of the individual items in reference to the separate units a large amount of t-values was computed. In the process of finding the most sensitive units for each item, it, by default, produces a rank order of the units in reference to the items.

These rank order findings can have significant application when looking at the utility of the different items within the units. Meaning, just because one unit is second or third most sensitive to a certain item does not mean that it has no practical application for the unit. While the results did find some units to be more sensitive than others, the bigger picture of the results indicates that the many of the items are highly sensitive to change for clients housed on a variety of units. Therefore, these findings further support the overall validity of the BASIS-32 not only on the total score and subscale level, but also it adds additional support for the validity of the BASIS-32 to a deeper level, the item level, while at the same time speaking to the use of the BASIS-32 on separate hospital units.

While the findings from these analyses did produce some highly sensitive and significant results, it should be noted there are limitations to the application of these findings. The most obvious of these being, the sample from was taken from an inpatient facility. Thus, there is potential to apply these to another inpatient facility, but one should take caution when looking to apply the findings to another type of facility, i.e. college counseling center. If the goal is to understand the utility of the BASIS-32 in other patient environments, there further study of the BASIS-32 in the other patient populations would be needed.

In addition, the data points were gathered on an intake and discharge model, producing only two data points for each patient. If the goal of the measure is to track client change as they progress through treatment, a more ideal model of data gathering and analysis would have taken place on several occasions, producing multiple data points, allowing for a more complex analysis change over time. A statistical analysis known as hierarchical linear modeling would be a example of a type of analysis that could be utilized through multiple data points, and an analysis that does not work with the pre/post model. Multiple data points would allow for more than a straight line of client changes, and while being more complex it could speak further to the utility and validity of the BASIS-32, especially on the item level.

And mentioned earlier in the manuscript, the limitations of the applicability of some of the findings when the data was broken down by individual units meant that the it was difficult to judge the validity and utility of the items in reference to the Senior and Partial Hospitalization units. An effort to obtain a larger sample size for these units in particular could allow for a more complete and thorough analysis of the items when

broken down by individual units. It would not only allow for the a better overall picture of the BASIS-32 in reference to these units, but would it would also allow for a more complete breakdown of the BASIS-32 on the total score, subscale, and item level. It would be a process that could only benefit the study and application of the BASIS-32.

The goal of this study was to further understand the utility of the BASIS-32 on the total score, subscale, and, most notably, the item level, while in the process educating the reader for the need of more in-depth studies of outcome measures, not only on the total score and subscale level, but also on the item level. It continued an analysis and selection model originally proposed by the Vermeersch (8888) adapted to the fit the limits of the data pool. By using this model, the total score, subscale, and items of the BASIS-32 were able to analyzed based on an inpatient setting, the various time periods of symptomology, and lastly, the separate units within the hospital. This process aided in further supporting the construct validity of the BASIS-32, while at the same time pointing out the need for further research on the BASIS-32, especially on the item level.

Finally, based on the findings of this study, it is suggested that further analysis of the BASIS-32 would aid greatly in understanding the construct of the questionnaire. Further study would also aid in understanding the various factors that influence the validity of the BASIS-32, as well as other outcome measures. In addition, a study utilizing a multiple data point collection method would greatly aid in a more in-depth study. And lastly, while the demand for outcome measurement intensifies, additional research in the study and application of outcome measurement could only benefit the science and clinical realm of the various therapy fields.

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# Appendix A

Results of Data Analysis on Items, Subscales, and Total Score of the Behavior and Symptom Identification Scale (BASIS-32) divided by treatment Unit.

Basis 32 – 1. Managing day to day life

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.11 | 0.54 | 0.57 | 6.01 | 0.000 | 0.54 |
| Senior | 1.41 | 0.86 | 0.55 | 1.72 | 0.096 | 0.40 |
| Adult CD | 1.93 | 0.96 | 0.98 | 6.71 | 0.000 | 0.77 |
| Adult | 1.93 | 0.96 | 0.97 | 11.19 | 0.000 | 0.76 |
| Partial | 2.00 | 0.83 | 1.17 | 3.27 | 0.004 | 0.92 |

Basis 32 – 2. Household responsibilities

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 0.99 | 0.59 | 0.40 | 4.59 | 0.000 | 0.40 |
| Senior | 1.72 | 1.14 | 0.59 | 1.61 | 0.118 | 0.42 |
| Adult CD | 1.94 | 1.00 | 0.94 | 6.51 | 0.000 | 0.70 |
| Adult | 1.76 | 0.86 | 0.91 | 10.32 | 0.000 | 0.69 |
| Partial | 1.70 | 0.91 | 0.78 | 2.66 | 0.014 | 0.63 |

Basis 32 – 3. Work

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.02 | 0.62 | 0.40 | 4.91 | 0.000 | 0.38 |
| Senior | 0.69 | 1.21 | -0.52 | -1.53 | 0.138 | 0.38 |
| Adult CD | 1.76 | 1.16 | 0.61 | 3.61 | 0.000 | 0.41 |
| Adult | 1.64 | 1.13 | 0.53 | 5.11 | 0.000 | 0.34 |
| Partial | 2.13 | 1.35 | 0.78 | 1.84 | 0.080 | 0.48 |

Basis 32 – 4. School

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.74 | 0.92 | 0.82 | 7.20 | 0.000 | 0.64 |
| Senior | 0.45 | 0.83 | -0.38 | -1.00 | 0.326 | 0.29 |
| Adult CD | 0.94 | 0.67 | 0.28 | 1.83 | 0.070 | 0.20 |
| Adult | 0.94 | 0.80 | 0.16 | 1.87 | 0.062 | 0.10 |
| Partial | 0.52 | 0.57 | -0.04 | -0.15 | 0.885 | 0.05 |

Basis 32 – 5. Leisure time or recreational activities

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 0.82 | 0.36 | 0.46 | 4.82 | 0.000 | 0.46 |
| Senior | 1.10 | 0.90 | 0.21 | 0.76 | 0.456 | 0.16 |
| Adult CD | 1.97 | 1.19 | 0.77 | 5.17 | 0.000 | 0.54 |
| Adult | 1.70 | 0.88 | 0.82 | 8.46 | 0.000 | 0.62 |
| Partial | 2.22 | 0.96 | 1.26 | 3.65 | 0.001 | 1.13 |

Basis 32 – 6. Adjusting to major life stressors

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.94 | 1.18 | 0.76 | 6.53 | 0.000 | 0.57 |
| Senior | 2.45 | 1.52 | 0.93 | 3.05 | 0.005 | 0.66 |
| Adult CD | 2.52 | 1.64 | 0.88 | 5.66 | 0.000 | 0.66 |
| Adult | 2.52 | 1.56 | 0.97 | 9.10 | 0.000 | 0.69 |
| Partial | 2.43 | 1.74 | 0.70 | 1.81 | 0.084 | 0.53 |

Basis 32 – 7. Relationship with family members

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.67 | 0.90 | 0.77 | 7.48 | 0.001 | 0.61 |
| Senior | 1.21 | 0.79 | 0.41 | 1.40 | 0.173 | 0.33 |
| Adult CD | 1.71 | 1.08 | 0.64 | 4.20 | 0.000 | 0.48 |
| Adult | 1.76 | 0.85 | 0.91 | 10.41 | 0.000 | 0.71 |
| Partial | 1.61 | 1.09 | 0.52 | 1.54 | 0.137 | 0.47 |

Basis 32 – 8. Gettings along with people outside of the family

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 0.92 | 0.55 | 0.37 | 4.36 | 0.000 | 0.37 |
| Senior | 0.76 | 0.62 | 0.14 | 0.81 | 0.424 | 0.12 |
| Adult CD | 1.36 | 0.70 | 0.67 | 4.80 | 0.000 | 0.53 |
| Adult | 1.17 | 0.70 | 0.47 | 5.51 | 0.000 | 0.39 |
| Partial | 0.96 | 0.83 | 0.13 | 0.39 | 0.700 | 0.12 |

Basis 32 – 9. Isolation or feelings of loneliness

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.67 | 0.83 | 0.85 | 7.07 | 0.000 | 0.63 |
| Senior | 1.97 | 1.28 | 0.69 | 2.89 | 0.007 | 0.52 |
| Adult CD | 2.18 | 1.14 | 1.05 | 7.28 | 0.000 | 0.73 |
| Adult | 2.49 | 1.23 | 1.26 | 13.49 | 0.000 | 0.93 |
| Partial | 2.17 | 0.96 | 1.22 | 3.03 | 0.006 | 0.87 |

Basis 32 – 10. Being able to feel close to others

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.29 | 0.74 | 0.55 | 5.08 | 0.000 | 0.44 |
| Senior | 1.00 | 0.90 | 0.10 | 0.37 | 0.717 | 0.08 |
| Adult CD | 1.96 | 1.00 | 0.97 | 6.86 | 0.000 | 0.72 |
| Adult | 2.08 | 0.98 | 1.11 | 9.45 | 0.000 | 0.72 |
| Partial | 1.78 | 1.13 | 0.65 | 1.69 | 0.105 | 0.46 |

Basis 32 – 11. Being realistic about yourself or others

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.10 | 0.58 | 0.52 | 5.01 | 0.000 | 0.48 |
| Senior | 1.24 | 0.93 | 0.31 | 0.98 | 0.338 | 0.24 |
| Adult CD | 1.86 | 1.00 | 0.85 | 6.40 | 0.000 | 0.69 |
| Adult | 1.81 | 1.02 | 0.81 | 8.23 | 0.000 | 0.61 |
| Partial | 1.83 | 1.22 | 0.61 | 1.84 | 0.080 | 0.52 |

Basis 32 – 12. Recognizing and expressing emotions appropriately

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.55 | 0.70 | 0.84 | 7.90 | 0.000 | 0.71 |
| Senior | 1.31 | 0.83 | 0.48 | 1.30 | 0.203 | 0.36 |
| Adult CD | 1.86 | 1.15 | 0.71 | 4.86 | 0.000 | 0.57 |
| Adult | 2.07 | 1.04 | 1.05 | 10.49 | 0.000 | 0.79 |
| Partial | 2.09 | 1.26 | 0.83 | 2.20 | 0.039 | 0.71 |

Basis 32 – 13. Developing independence, autonomy

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 0.72 | 0.49 | 0.22 | 3.07 | 0.000 | 0.27 |
| Senior | 1.41 | 0.93 | 0.48 | 1.46 | 0.156 | 0.35 |
| Adult CD | 1.53 | 0.94 | 0.60 | 4.28 | 0.000 | 0.45 |
| Adult | 1.72 | 0.90 | 0.84 | 8.33 | 0.000 | 0.61 |
| Partial | 1.61 | 1.17 | 0.43 | 1.16 | 0.260 | 0.32 |

Basis 32 – 14. Goals or direction in life

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.34 | 0.61 | 0.73 | 7.41 | 0.000 | 0.61 |
| Senior | 1.34 | 0.90 | 0.45 | 1.47 | 0.152 | 0.31 |
| Adult CD | 1.95 | 0.91 | 1.04 | 7.06 | 0.000 | 0.79 |
| Adult | 2.04 | 1.11 | 0.93 | 9.65 | 0.000 | 0.68 |
| Partial | 2.26 | 1.17 | 1.09 | 3.61 | 0.002 | 0.95 |

Basis 32 – 15. Lack of self-confidence, feelings bad about yourself

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.82 | 0.85 | 0.97 | 8.80 | 0.000 | 0.74 |
| Senior | 1.83 | 0.93 | 0.90 | 2.96 | 0.006 | 0.63 |
| Adult CD | 2.39 | 1.26 | 1.14 | 7.78 | 0.000 | 0.84 |
| Adult | 2.52 | 1.33 | 1.20 | 12.33 | 0.000 | 0.86 |
| Partial | 2.43 | 1.30 | 1.13 | 3.51 | 0.002 | 0.88 |

Basis 32 – 16. Apathy, lack of interest in things

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.45 | 0.78 | 0.67 | 6.28 | 0.003 | 0.53 |
| Senior | 1.52 | 1.07 | 0.45 | 1.47 | 0.152 | 0.29 |
| Adult CD | 2.14 | 1.09 | 1.06 | 7.16 | 0.000 | 0.77 |
| Adult | 2.31 | 1.07 | 1.25 | 12.55 | 0.000 | 0.91 |
| Partial | 2.22 | 1.17 | 1.04 | 2.91 | 0.008 | 0.83 |

Basis 32 – 17. Depression, hopelessness

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.98 | 0.80 | 1.18 | 9.79 | 0.000 | 0.87 |
| Senior | 2.41 | 1.10 | 1.31 | 3.62 | 0.001 | 0.90 |
| Adult CD | 2.27 | 0.97 | 1.31 | 9.84 | 0.000 | 0.98 |
| Adult | 2.68 | 1.27 | 1.42 | 11.50 | 0.000 | 0.87 |
| Partial | 2.35 | 1.13 | 1.22 | 2.95 | 0.007 | 0.93 |

Basis 32 – 18. Suicidal feelings or behaviors

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.53 | 0.40 | 1.13 | 9.36 | 0.000 | 0.92 |
| Senior | 1.00 | 0.48 | 0.52 | 2.42 | 0.023 | 0.43 |
| Adult CD | 0.86 | 0.35 | 0.51 | 3.86 | 0.000 | 0.45 |
| Adult | 1.97 | 0.44 | 1.54 | 13.72 | 0.000 | 1.15 |
| Partial | 1.00 | 0.65 | 0.35 | 1.12 | 0.277 | 0.30 |

Basis 32 – 19. Physical symptoms

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.42 | 0.67 | 0.74 | 7.01 | 0.000 | 0.59 |
| Senior | 1.90 | 0.86 | 1.03 | 3.98 | 0.000 | 0.72 |
| Adult CD | 2.68 | 1.27 | 1.41 | 10.20 | 0.000 | 1.10 |
| Adult | 2.34 | 1.04 | 1.31 | 13.12 | 0.000 | 0.96 |
| Partial | 2.30 | 1.17 | 1.13 | 3.21 | 0.004 | 0.84 |

Basis 32 – 20. Fear, anxiety, or panic

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.28 | 0.63 | 0.66 | 6.10 | 0.000 | 0.55 |
| Senior | 1.90 | 1.21 | 0.69 | 2.14 | 0.041 | 0.47 |
| Adult CD | 2.35 | 1.23 | 1.13 | 9.12 | 0.000 | 0.88 |
| Adult | 2.38 | 1.02 | 1.36 | 14.15 | 0.000 | 1.04 |
| Partial | 2.17 | 1.17 | 1.00 | 3.98 | 0.001 | 0.79 |

Basis 32 – 21. Confusion, concentration, memory

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.23 | 0.76 | 0.48 | 4.85 | 0.000 | 0.37 |
| Senior | 1.55 | 0.83 | 0.72 | 2.07 | 0.048 | 0.55 |
| Adult CD | 1.87 | 1.02 | 0.86 | 6.48 | 0.000 | 0.68 |
| Adult | 2.11 | 0.97 | 1.14 | 13.01 | 0.000 | 0.88 |
| Partial | 2.30 | 1.30 | 1.00 | 3.12 | 0.005 | 0.79 |

Basis 32 – 22. Disturbing or unreal thoughts or beliefs

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.03 | 0.40 | 0.63 | 6.28 | 0.000 | 0.56 |
| Senior | 1.07 | 0.45 | 0.62 | 1.80 | 0.083 | 0.49 |
| Adult CD | 0.87 | 0.44 | 0.43 | 3.82 | 0.000 | 0.36 |
| Adult | 1.36 | 0.47 | 0.89 | 9.60 | 0.000 | 0.72 |
| Partial | 1.43 | 0.65 | 0.78 | 2.66 | 0.014 | 0.64 |

Basis 32 – 23. Hearing voices, seeing things

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 0.60 | 0.28 | 0.33 | 3.46 | 0.000 | 0.31 |
| Senior | 0.52 | 0.21 | 0.31 | 1.18 | 0.248 | 0.33 |
| Adult CD | 0.41 | 0.25 | 0.16 | 1.52 | 0.130 | 0.18 |
| Adult | 0.79 | 0.30 | 0.49 | 6.55 | 0.000 | 0.46 |
| Partial | 0.61 | 0.26 | 0.35 | 1.89 | 0.073 | 0.34 |

Basis 32 – 24. Manic, bizarre behavior

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 0.81 | 0.39 | 0.42 | 4.34 | 0.001 | 0.41 |
| Senior | 0.79 | 0.34 | 0.45 | 1.49 | 0.147 | 0.43 |
| Adult CD | 0.62 | 0.35 | 0.27 | 2.52 | 0.013 | 0.25 |
| Adult | 1.01 | 0.39 | 0.62 | 7.38 | 0.000 | 0.56 |
| Partial | 0.70 | 0.43 | 0.26 | 0.92 | 0.366 | 0.26 |

BASIS 32 – 25. Mood swings, unstable moods

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.54 | 0.64 | 0.89 | 8.17 | 0.000 | 0.72 |
| Senior | 1.34 | 0.55 | 0.79 | 2.58 | 0.015 | 0.63 |
| Adult CD | 1.55 | 0.80 | 0.75 | 5.29 | 0.000 | 0.60 |
| Adult | 1.88 | 0.74 | 1.14 | 12.02 | 0.000 | 0.90 |
| Partial | 1.87 | 0.74 | 1.13 | 3.21 | 0.004 | 0.89 |

Basis 32 – 26. Uncontrollable, compulsive behavior

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.13 | 0.38 | 0.75 | 6.75 | 0.000 | 0.63 |
| Senior | 0.72 | 0.34 | 0.38 | 1.32 | 0.197 | 0.38 |
| Adult CD | 0.91 | 0.44 | 0.47 | 3.46 | 0.001 | 0.39 |
| Adult | 1.25 | 0.48 | 0.76 | 8.23 | 0.000 | 0.64 |
| Partial | 1.22 | 0.43 | 0.78 | 3.60 | 0.002 | 0.73 |

Basis 32 – 27. Sexual activity or preoccupation

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 0.49 | 0.22 | 0.27 | 3.28 | 0.000 | 0.31 |
| Senior | 0.28 | 0.59 | -0.31 | -1.07 | 0.293 | -0.28 |
| Adult CD | 0.93 | 0.61 | 0.33 | 2.56 | 0.012 | 0.26 |
| Adult | 0.75 | 0.41 | 0.33 | 4.31 | 0.000 | 0.32 |
| Partial | 0.74 | 0.48 | 0.26 | 1.14 | 0.266 | 0.24 |

Basis 32 – 28. Drinking Alcoholic Beverages

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 0.66 | 0.31 | 0.35 | 4.05 | 0.000 | 0.36 |
| Senior | 0.28 | 0.14 | 0.14 | 0.72 | 0.475 | 0.20 |
| Adult CD | 2.27 | 0.67 | 1.61 | 9.30 | 0.000 | 1.02 |
| Adult | 0.89 | 0.40 | 0.48 | 6.35 | 0.000 | 0.42 |
| Partial | 0.26 | 0.17 | 0.09 | 0.38 | 0.704 | 0.12 |

Basis 32 – 29. Taking illegal drugs, misusing drugs

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 0.82 | 0.28 | 0.54 | 5.06 | 0.000 | 0.50 |
| Senior | 0.31 | 0.14 | 0.17 | 0.89 | 0.378 | 0.24 |
| Adult CD | 1.51 | 0.62 | 0.89 | 5.92 | 0.000 | 0.60 |
| Adult | 0.63 | 0.25 | 0.40 | 5.38 | 0.000 | 0.39 |
| Partial | 0.22 | 0.17 | 0.04 | 0.20 | 0.840 | 0.07 |

Basis 32 – 30. Controlling Temper, outbursts, of anger, violence

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.40 | 0.65 | 0.75 | 7.31 | 0.000 | 0.62 |
| Senior | 0.66 | 0.17 | 0.48 | 2.64 | 0.014 | 0.66 |
| Adult CD | 1.27 | 0.57 | 0.69 | 4.91 | 0.000 | 0.58 |
| Adult | 1.21 | 0.51 | 0.70 | 8.10 | 0.000 | 0.60 |
| Partial | 1.00 | 0.52 | 0.48 | 2.21 | 0.038 | 0.48 |

Basis 32 – 31. Impulsive, illegal or recklass behavior

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 0.76 | 0.32 | 0.44 | 4.73 | 0.000 | 0.45 |
| Senior | 0.48 | 0.24 | 0.24 | 1.07 | 0.294 | 0.30 |
| Adult CD | 1.01 | 0.40 | 0.61 | 4.85 | 0.000 | 0.54 |
| Adult | 0.79 | 0.36 | 0.42 | 5.23 | 0.000 | 0.40 |
| Partial | 0.57 | 0.35 | 0.22 | 1.04 | 0.308 | 0.24 |

Basis 32 – 32. Feelings satisfaction with you life

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 1.63 | 0.86 | 0.77 | 5.43 | 0.000 | 0.56 |
| Senior | 1.59 | 0.90 | 0.69 | 2.12 | 0.043 | 0.48 |
| Adult CD | 2.42 | 1.22 | 1.20 | 7.44 | 0.000 | 0.88 |
| Adult | 2.57 | 1.17 | 1.41 | 15.08 | 0.000 | 1.04 |
| Partial | 2.43 | 1.13 | 1.30 | 4.04 | 0.001 | 1.09 |

Basis 32 - Depression/Anxiety Subscale

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 9.82 | 4.51 | 5.31 | 10.85 | 0.000 | 0.89 |
| Senior | 11.62 | 6.45 | 5.17 | 4.22 | 0.000 | 0.83 |
| Adult CD | 12.82 | 6.61 | 5.72 | 11.92 | 0.000 | 1.09 |
| Adult | 14.38 | 6.56 | 7.87 | 18.47 | 0.000 | 1.27 |
| Partial | 12.43 | 6.83 | 5.61 | 3.21 | 0.004 | 0.90 |

Basis 32 - Daily Living Skills Subscale

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 10.70 | 5.92 | 4.78 | 8.60 | 0.000 | 0.68 |
| Senior | 11.45 | 8.66 | 2.79 | 1.40 | 0.174 | 0.31 |
| Adult CD | 16.48 | 9.24 | 9.97 | 7.96 | 0.000 | 0.81 |
| Adult | 16.66 | 8.73 | 8.02 | 14.87 | 0.000 | 0.93 |
| Partial | 17.13 | 9.39 | 7.74 | 3.29 | 0.003 | 0.92 |

Basis 32 - Relation to Self/Others Subscale

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 9.68 | 4.93 | 4.75 | 10.34 | 0.000 | 0.80 |
| Senior | 8.69 | 5.90 | 2.79 | 1.77 | 0.087 | 0.39 |
| Adult CD | 12.99 | 7.10 | 7.76 | 8.20 | 0.000 | 0.84 |
| Adult | 13.45 | 7.03 | 6.42 | 13.62 | 0.000 | 0.94 |
| Partial | 12.96 | 8.00 | 4.96 | 2.54 | 0.019 | 0.76 |

Basis 32 - Impulsive/Addictive Behaviors Subscale

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 6.31 | 2.59 | 3.72 | 8.95 | 0.000 | 0.81 |
| Senior | 3.79 | 1.59 | 2.21 | 2.09 | 0.046 | 0.58 |
| Adult CD | 8.56 | 3.50 | 5.03 | 8.64 | 0.000 | 0.93 |
| Adult | 6.64 | 2.75 | 3.89 | 12.06 | 0.000 | 0.85 |
| Partial | 5.13 | 2.39 | 2.74 | 3.19 | 0.004 | 0.70 |

Basis 32 - Psychosis Subscale

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 2.93 | 1.29 | 1.64 | 5.95 | 0.000 | 0.54 |
| Senior | 2.66 | 1.59 | 1.07 | 1.19 | 0.246 | 0.34 |
| Adult CD | 2.85 | 1.65 | 1.19 | 3.57 | 0.001 | 0.35 |
| Adult | 3.91 | 1.57 | 2.33 | 10.16 | 0.000 | 0.71 |
| Partial | 3.48 | 1.83 | 1.65 | 2.47 | 0.022 | 0.54 |

Basis 32 - All Items

| Unit | Pre. Mean | Post Mean | C. S. | T Value | Sig | Effect Sizes |
|---|---|---|---|---|---|---|
| | | | | | | |
| Adolescent | 39.45 | 19.24 | 20.20 | 10.98 | 0.000 | 0.88 |
| Senior | 38.21 | 24.17 | 14.03 | 2.51 | 0.018 | 0.58 |
| Adult CD | 53.70 | 28.10 | 25.60 | 10.02 | 0.000 | 0.96 |
| Adult | 55.04 | 26.65 | 28.39 | 17.40 | 0.000 | 1.15 |
| Partial | 51.13 | 28.43 | 22.70 | 3.34 | 0.003 | 0.92 |