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The Relationship Between Psychological Well-Being and Work Productivity: Validation of the OQ Productivity Index

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THE RELATIONSHIP BETWEEN PSYCHOLOGICAL WELL-BEING
AND WORK PRODUCTIVITY: VALIDATION OF
THE OQ PRODUCTIVITY INDEX

by

Vinessa K. Trotter

A dissertation submitted to the faculty of

Brigham Young University

in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Department of Clinical Psychology

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BRIGHAM YOUNG UNIVERSITY

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As chair of the candidate's graduate committee, I have read the dissertation of Vinessa K. Trotter in its final form and have found that (1) its format, citations, and bibliographical style are consistent and acceptable and fulfill university and department style requirements; (2) its illustrative materials including figures, tables, and charts are in place; and (3) the final manuscript is satisfactory to the graduate committee and is ready for submission to the university library.

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ABSTRACT

THE RELATIONSHIP BETWEEN PSYCHOLOGICAL WELL-BEING
AND WORK PRODUCTIVITY: VALIDATION OF
THE OQ PRODUCTIVITY INDEX

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Department of Psychology

Doctor of Philosophy

Managed Mental Health Care (MMHC) began blanketing the United States when cost of care rose exponentially. MMHC is one avenue many employers and insurance companies have chosen to provide employees with mental health treatment at controlled costs. However, not all employers view supplying their employees with mental health treatment beneficial, as they do not know mental health problems can significantly decrease work productivity. Brown and Jones (2005) used the Social Role Scale (SR) of the Severe Outcome Questionnaire (SOQ) to estimate work productivity in employees under the assumption that the scale measures work productivity. The purpose of this study was to move closer to an estimation of the relationship between improved mental health and improved workplace functioning by examining the relationships among a self-report measure of mental health (i.e., the SR), a self-report measure of work productivity

(i.e., the Work Productivity and Activity Impairment Scale [WPAI]), and objective measures of work productivity (i.e., the quality and timeliness of institutional records, supervisor ratings, and sick hours used). It was thought that understanding the relationships among these measures might assist in estimating the cost/benefit of investing in psychotherapy. Participants in this study were employees and inpatients at the Utah State Hospital. Statistical analyses indicated the SR did predict two WPAI scales (i.e., Presenteeism and Activity Impairment) for employees. Specific relationships among measures, and suggestions for future research, are discussed.

Keywords:

Severe Outcome Questionnaire (SOQ)

Social Role Scale

Functional Impairment Scale

Work Productivity

Outcome Measurement

Managed Mental Health Care

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Table of Contents

Abstract	4
Acknowledgements	6
List of Tables	10
Chapter One: Introduction	11
Chapter Two: Literature Review	14
Definition of Work	14
Work-Related Stress	15
History of Mental Health Treatment	16
Mental Health Treatment and Mental Disorders	16
Mental Health and Productivity	17
Mental Health Treatment and Work Productivity	18
Work and Managed Mental Health Care	19
Assessment of Work Productivity	21
Employee Self-Report	21
WPAI as Most Comprehensive Work Productivity Measure	24
Objective Measures	27
Employer Ratings	28
Summary	28
Clinical Outcome Measurement	29
History of the OQ-45	30
The OQ-30	32
The SOQ	33

The SR	35
SR As a Measure of Work Productivity	35
Validation of the SOQ as a Measure of Work Productivity	37
Chapter Three: Method	39
Participants	39
Measures	41
Procedures	42
Confidentiality	45
Chapter Four: Results	47
Data Preparation	47
Statistical Analyses	49
Quantitative Analysis	49
Case Analysis of an Outlier	56
Chapter Five: Discussion	58
Employees	58
Productivity Calculator	59
Demographic Variables	61
Patient Industrials	62
Time	64
Employer Interventions	64
Learning Culture Organization	66
Limitations	67
Personal Reactions	69

Appendix A: Consent Document for Employees	71
Appendix B: Consent Document for Patient Industrials	74
Appendix C: Work Productivity and Activity Impairment Questionnaire (WPAI)	77
Appendix D: Severe Outcome Questionnaire (SOQ)	79
Appendix E: Demographic Information	81
Appendix F: Patient Industrial Timesheet with Supervisor Rating Items	83
Appendix G: Article for Journal Submission	84
References	117

LIST OF TABLES

1. Summary of the Recommended Health-Related Workplace Productivity Measurement Instruments, Adapted from Table 3 in Loeppke and colleagues (2003)	25
2. Races of Participants	40
3. Marital Status of Participants	40
4. Education Level of Participants	40
5. Number of Medical Problems Participants Reported	41
6. Number of Mental Health Problems Participants Reported	41
7. USH Work Productivity Measures by Discipline	43
8. Predicting Work Productivity for USH Employees	51
9. Predicting Work Productivity for USH Patient Industrials	52
10. Correlations, Significance Values, and Sample Sizes of Predictors, Employees and Patient Industrials Combined	53
11. Correlations, Significance Values, and Sample Sizes of Predictors, Employees Only	53
12. Correlations, Significance Values, and Sample Sizes of Predictors, Patient Industrials Only	54
13. Estimates of Work Productivity Measure by Predictor and Population	55
14. Correlations, Significance Values, and Sample Sizes of Objective and Self-Report Work Productivity Measures for Employees	56
15. Hypothetical Example of Productivity Calculator	60

CHAPTER ONE

INTRODUCTION

Johnson and Kreuger (2006) explain many people assume income and assets create happiness. In their study, they found that, despite this popular myth, money did not directly cause life satisfaction in their participants. Instead, how participants perceived their financial situation, and how much control they considered themselves having over their lives, mediated the relationship between actual wealth and life satisfaction. It is not difficult to argue that in our modern society a productive workforce that maximizes profits depends on the health and well being of employees. Viewed in this way, employers and corporations can see it is to their advantage to look after human resources. When employers see employees as investments and high value “assets”, then the importance of providing medical and mental health treatment is seen as a wise expenditure of capital. The concept of employer-provided benefits was initially vilified, in part because it was imagined to diminish profits. The Kaiser-Permanente medical group was an early exception to this trend (Smillie, 1991).

As the cost of care rose, Managed Care—a kind of Kaiser-Permanente model—blanketed the United States as a solution to the high costs of treatment. Winegar and Bistline (1994) describe the phenomenon of Managed Mental Health Care (MMHC) as the avenue employers and insurance companies have chosen to provide employees with mental health treatment at controlled costs. However, MMHC poses several challenges for mental health treatment providers. One of these challenges involves treatment efficacy. Specifically, not all mental health treatment providers are convinced that cost management results in high-quality (or even adequate) treatment.

Fortunately, mental health treatment providers need not lose hope. Professionals like Bolek and Somodi (1998) modified their conceptualization of mental health treatment responsibilities in order to better serve the needs of MMHC consumers. For example, communicating with professionals in other disciplines aided their client's treatment progress. They concluded,

Some of the traditional services psychologists offer may no longer be reimbursed as in the past (such as a 6- to 8-hr neuropsychological assessment), but the changing marketplace may open up other avenues of service delivery to explore Some of them will require a change of practice expectations and a modification but not diminution of one's role as a psychologist (p. 73).

According to Lyons and colleagues (1997), one way the mental health community can address MMHC's monetary concerns, and its own efficacy concerns, is to measure clinical outcomes. They list several examples of clinical outcome measures, including The Outcome Questionnaire-45, the Addiction Severity Index, and the Child Behavior Checklist. Clinical outcome measures indicate a client's progress in treatment, providing data about the efficacy of treatment for that particular client. Using such scales can not only show the degree psychological treatments improve psychological functioning, but the relationship between restoration of psychological health and increased work performance.

The current study investigates relationships of a clinical outcome measure—the Severe Outcome Questionnaire (SOQ)—to measures of work productivity. Burlingame, Lee, Nelson, and Lambert (2007) describe the SOQ and its available psychometric properties in *The Administration and Scoring Manual for the Severe Outcome*

Questionnaire. The SOQ consists of three subscales, including the Social Role Scale (SR), which contains questions relating to work and social role performance. Brown and Jones (2005) used this scale to estimate work productivity in employees under the assumption that the scale does, indeed, measure work productivity. This study attempts to examine their assumption by correlating SOQ scores with measures of work productivity (i.e., a self-report questionnaire, objective measures determined by work discipline, and supervisor ratings) and absenteeism (i.e., sick hours used).

This dissertation contains five chapters, and appendices illustrating documents used in this study. In this chapter, I briefly described the historical context for the present study. In the next four chapters, I will describe the study in detail. Chapter 2 defines terms like “work productivity”, “mental health treatment”, and “managed mental health care”. It also provides a rationale for the study using existing literature. Chapter 3 illuminates the methodology used to complete the study. Chapter 4 provides the results of this study: the data gathered from participants, and significant relationships among the variables. Chapter 5 then discusses the results of this study within the broader context of mental health treatment and its application to employed Americans. Chapter 5 also discusses the results, strengths and weaknesses of this study, and suggestions for future research.

CHAPTER 2

LITERATURE REVIEW

Definition of Work

In about 380 B.C., the characters in Plato's (1992) *Republic* discussed an ideal city. In this city (which they called "kallipolis"), social classes reflected separate parts of the soul. Rulers, auxiliaries, and craftsmen—the different types of people in this city—corresponded to rationale, spirit, and appetite (i.e., what they considered the three different aspects of the soul), respectively. To the characters in *Republic*, kallipolis was the epitome of "justice" because all citizens completed the "work" of its own social class without attempting to complete the work of other classes. According to Hannah Arendt (1998), Plato insisted the citizens of kallipolis fit his ideal, sacrificing the diversity of human beings for the sake of a theory. She asserted that his perspective permeated political thought for too long, and that his "ideal city" does not allow for the plurality of humankind, or the consequences of "plural initiatives." Arendt then articulates the differences among what she considers unique human activities: action, labor, and work. She suggests philosophers and political thinkers like Plato largely ignored the distinction among these terms.

Arendt (1998) says "action" is human activity performed by collections of individual people. Action occurs between people without physical matter (e.g., living amongst others, creating politics and history, etc.) She describes "labor" as activity aimed at sustaining physical life or biological processes. The long-term goal of labor is individual and species survival (e.g., searching for food). She defines "work" as an activity undertaken to create an "artificial" world of objects that are unnecessary for

human existence. Work produces a kind of permanence for mortal beings, and it results in artifacts. She states that, in today's world, occupations tend to involve work because automation has reduced the amount of time people dedicate to labor. However, she also admits that many forms of labor have evolved into work, since consumers buy food and other essentials as if they were any other type of commodity.

Work-Related Stress

Despite disagreement among philosophers about the definition of "work," Americans tend to use the term frequently and broadly, often referring to the method(s) by which they earn money. Historically, Americans have worked for a variety of reasons. According to Bernstein (1997), the purposes of work in America, and the stressors associated with work, have evolved. He recounts how Martin Luther, John Calvin, and other 16th- and 17th-century religious leaders in Europe considered hard work a sign of salvation. Those who could not find work, or who were unwilling to work, faced societal rejection and possible death. Many escaped this oppression by moving to Colonial America where work was an opportunity to possess land and goods. Work, once a godly calling, became a systemized means of earning wages. As a result, workers grew alienated in repetitious and unyielding jobs, seeking happiness through personal wealth and success. Bernstein then describes how, by the 1920s, research (e.g., the Hawthorne Experiments) began showing that workers desired more from their jobs: employees wanted recognition as people who can think and work alongside employers with the possibility of occupational advancement. Thus, as employers learned to motivate their employees, work slowly progressed into a means of self-fulfillment. Because work now equates self-fulfillment, employees find themselves shifting their

energy to work instead of other life responsibilities. Bernstein indicates employees seek a balance between work and the rest of life. One could assume from this overview of work throughout American history that stress is simply a part of work, despite how employees perceive its purpose. A good question to ask here is whether one could consider work-related stress a mental health issue.

History of Mental Health Treatment

Edward Shorter (1997) recounts the history of mental health treatment. He states that psychiatric illness is as old as humanity, and that humanity has always found ways to address psychiatric illness. Until the rise of traditional asylums in the eighteenth century, “insane” individuals were kept at home with family, sporadically housed in special hospitals, chained or caged like animals, or left on the streets to fend for themselves. Shorter describes how asylums eventually approximated overcrowded warehouses instead of safe havens where patients could heal. According to Shorter (1997), Freud eventually introduced psychoanalysis in the early 20th century. Psychoanalysis focused on childhood experiences and adulthood stress as the cause of mental illness. Since then, researchers have battled between treatment for biological disorders (e.g., medication) and treatment for disorders linked to experience (e.g., psychotherapy). Applying this discussion of mental health to work-related stress, one can see how work might cause adulthood stress, and is perhaps worthy of mental health treatment at times.

Mental Health Treatment and Mental Disorders

Mental health treatment, including psychotherapy, psychotropic medications, or a combination of the two, can substantially reduce depressive and other mental health symptoms (Allen, 2004; Goetzel, Ozminkowski, Sederer, & Mark, 2002; Lambert &

Ogles, 2004b; and Thase & Jindal, 2004). Lambert and Ogles (2004b) searched thousands of studies and dozens of meta-analyses. Their literature review highlighted how psychotherapy is effective across various populations, and that it remains effective when compared to placebo. Thase and Jindal (2004) concur, indicating that psychotherapy appears to be the best treatment for “the most prevalent [mental health] conditions for which people currently seek treatment.” These authors add that a combination of psychotherapy and psychotropic medications helps severe mental health disorders more than does psychotherapy alone. More severe conditions that benefit from combined treatment include schizophrenia, severe and chronic recurrent major depression, obsessive-compulsive disorder, and bipolar disorder. Unfortunately, despite overwhelming evidence validating the effectiveness of psychotherapy and psychotropic medications, many employers do not provide mental health benefits. This lack of benefits limits employees’ access to mental health treatment.

Mental Health and Productivity

Mental health problems, especially depressive disorders, can lead to loss of work productivity. Allen (2004) argues that an employer’s main concern regarding mental health issues is productivity. Not surprisingly, Lyons and colleagues (1997) indicate that some important reasons to assess clinical outcome are to increase work productivity, and to decrease absenteeism, on-the-job accidents, and employee turnover. Goetzel, Ozminkowski, Sederer, and Mark (2002) assert that about one out of every ten Americans suffers from a depressive disorder during a given year. This statistic is troubling because depression often remains undiagnosed and untreated. In their review of the literature, these authors found that depressed employees can cost their employers

up to 70% more in physical health care costs than non-depressed employees. Employees with mental disorders utilize medical care services more frequently, and utilize more expensive treatments, than do employees who have no significant impairments in their mental health. In 2005, Langlieb and Kahn reviewed the literature and cited one estimate by the World Health Organization that predicts depression will be the second overall cause of disability by the year 2020. Comorbidity complicates the problem because depression and anxiety often occur simultaneously (Langlieb & Kahn, 2005).

Employees suffering from mental health problems tend to cost employers money not only through medical services, but also through loss of work productivity (i.e., absenteeism, presenteeism, short-term disability, turnover, etc.; Goetzel, Ozminkowski, Sederer, & Mark, 2002; Langlieb & Kahn, 2005; Reilly, 2002). According to Langlieb and Kahn (2005), absenteeism is a traditional way to estimate work productivity loss. Absenteeism refers to the number of days or hours the employee missed at work. However, Langlieb and Kahn describe another phenomenon: presenteeism. Presenteeism occurs when an employee is mentally or physically “ill” but still goes to work. The employee works, but at a limited capacity. Presenteeism results in work production loss that is more elusive than loss resulting from absenteeism.

Mental Health Treatment and Work Productivity

Because mental health problems can negatively impact work productivity, and because psychotherapy and other interventions can alleviate the symptoms of many mental health problems, one could assume that mental health treatment can improve work productivity. However, current research does not adequately address the degree to which mental health treatment for employees affects work productivity (Goetzel, Ozminkowski,

Sederer, & Mark, 2002). One reason for inadequate research might be the absence of measures of work productivity in studies of treatment effects. Goetzel, Ozminkowski, Sederer, and Mark (2002) describe nine barriers to proper mental health management in the workplace. One of these barriers is that employers have little objective evidence to support investment in what they consider expensive mental health promotion programs. Employers might be more willing to invest in proper mental health treatment if they see its effects in terms of increased productivity.

Work and Managed Mental Health Care

Winegar and Bistline (1994), assert that, although employers might not provide their employees with access to mental health treatment, they would like to do so. Unfortunately, employers grew disappointed by exponentially rising costs. Additionally, the discipline was divided regarding what is considered the “best” treatment option for a given disorder. This division confused employers and pushed them toward insurance companies that agreed to decide for them which treatment options were “best.”

One problem was that many mental health treatment programs (e.g., substance abuse treatment) were lengthy, while others were relatively short. Insurance companies began covering a limited number of days or sessions, which infuriated the mental health community. Paradoxically, when insurance companies decreased the maximum number of days or sessions they allowed, treatment providers (and clients) used as many days as were allotted, suggesting that scarce resources made them more desirable. Insurance companies continued to manage care through limiting resources. From this, insurance companies concluded that mental health treatment providers could help their clients despite seriously restricting the number of hospital days or sessions allotted. The rising

costs and lack of standardization in mental health treatment inspired a revolution Winegar and Bistline (1994) call Managed Mental Health Care (MMHC). They liken this widespread change to the industrial revolution because standardization of treatment increased, and both costs and the number of treatment providers needed decreased. MMHC is often a part of larger networks like Health Maintenance Organizations (HMOs) and employer-based systems like Employee Assistance Programs (EAPs). Employers could now purchase affordable—and presumably effective—mental health treatment packages along with other healthcare options for their employees. This compromise satisfied employers and insurance companies. MMHC swept across America, and mental health treatment providers realized they should modify their treatment practices or risk losing their client referral base.

Lyons and colleagues (1997) describe how the mental health community addressed MMHC's concerns about cost and efficacy. The major strategy they delineate is measuring clinical outcomes. They argue that clinical outcome assessment is a cost- and resource-efficient way to determine whether a target treatment is effective. Examples they provide include questionnaires and interviews used for patients undergoing adult psychiatric care (e.g., The Outcome Questionnaire [OQ], Beck Depression Inventory [BDI], Severity of Psychiatric Illness [SPI], and Brief Psychiatric Rating Scale [BPRS]), substance abuse treatment (e.g., Addiction Severity Index [ASI] and Michigan Alcohol Screening Test), and child and adolescent mental health care (e.g., Brief Psychiatric Rating Scale for Children [BPRS-C], Child and Adolescent Functional Assessment Scale [CAFAS], and Child Behavior Checklist [CBCL]). These measures can be used to assess and/or track a patient's progress in treatment.

Assessment of Work Productivity

In order to bolster sales of mental health services to employers, it seems feasible to argue that such services could bolster work productivity, thus making such services a wise investment for companies providing health benefits. Work productivity as a topic of research interest has a long history in organization behavior/industrial psychology, but with scant attention to mental health issues. To conduct research on work productivity and mental health, quantifying work productivity is an absolute necessity. Prasad and colleagues (2004) discuss two major approaches to measuring work productivity: through the employee's self-report and through more "objective" means. Regarding employee self-report, three sets of authors have published reviews of work productivity instruments used in research on the impact of physical disability. A brief summary of each review, and conclusions drawn from all three, follows.

Employee Self-Report. In 2003, Loeppke and colleagues created a multidisciplinary group of expert panelists. Seven members of the expert panel were employers, seven were health care consultants, two were academicians, one was an employee coalition representative, and one was a government researcher. The expert panelists conducted a literature search in order to identify general health and migraine-specific work loss instruments. They searched the literature using MEDLINE, HealthSTAR, PsycINFO, and EconLit databases. Search terms included the following: Loss productivity, productivity, work loss, days missed from work, absenteeism, presenteeism, conceptual model, theoretical model, and indirect costs. The panel members also used the bibliographies of identified articles to obtain other literature.

After identifying several work productivity instruments, the panel members created two lists of criteria in order to judge the value of each instrument.

Members of the expert panel labeled the first list of criteria “Elements of Health-Related Workplace Productivity Measurement” (i.e., absenteeism, presenteeism, and employee turnover and replacement costs). The panelists labeled the second list of criteria “Key Characteristics of Health-Related Workplace Productivity Instruments” (i.e., possesses supportive scientific evidence; is applicable across work settings/occupations; supports effective business decision-making; and is practical). They defined scientific evidence as documented reliability and validity. An instrument supported business decision-making if its measure of work loss could be translated into a monetary figure. Panelists defined practicality as ease of administration, availability in different languages, and cost of administration. Five of the general health work productivity instruments met most of the criteria to different extents. Please see Table 1 for more details. The five instruments include the following: Employer Health Coalition of Tampa Assessment Instrument (EHC); Health and Performance Questionnaire (HPQ); Stanford Presenteeism Scale (SPS-6); Work Limitations Questionnaire (WLQ); and Work Productivity and Activity Impairment Questionnaire (WPAI).

In 2004, Lofland, Pizzi, and Frick also conducted a literature search and bibliography review. They utilized the same databases and search terms as Loeppke and colleagues. Instead of creating a panel of experts, however, these authors telephone surveyed 19 business leaders and researchers and asked them to identify and appraise health-related work productivity loss instruments. The authors critiqued the following for each instrument identified in the literature search and interviews: a) reliability, b) content

validity, c) construct validity, d) criterion validity, e) productivity metrics, f) scoring technique, g) whether scores would translate into monetary figures, h) number of items, i) methods of administration, and j) disease states in which it had been tested. Of the 11 instruments identified, three met the criteria to varying extents: WPAI, HLQ, and Migraine Work and Productivity Loss Questionnaire (MWPLQ). Of these, the MWPLQ is migraine-specific, which makes it implausible for general health-related work loss measurement. The HLQ had not been tested for mental disorders or psychiatric problems, suggesting less generalizability than that of the WPAI.

Prasad, Wahlqvist, Shikiar, and Shih (2004) conducted a literature search using ABI Info, Econlit, PsycINFO, and Paperchase databases. They used the following search terms: productivity or absenteeism or sick leave; instrument or measure or questionnaire; and employee or worker or “labour.” After retrieving the articles, they perused the bibliographies for more instruments. These authors argued that absenteeism is a limited way to assess work productivity loss. Therefore, they excluded articles that only focused upon absenteeism in order to identify instruments that included presenteeism. The six instruments identified were the WPAI, WLQ, HPQ, Health and Work Questionnaire (HWQ), Endicott Work Productivity Scale (EWPS), and Health and Labor Questionnaire (HLQ).

They found six general health and six disease-specific instruments. For the purposes of this paper, I will summarize their findings for the general health instruments. The authors critiqued each general health instrument using the following criteria: a) content validity, b) criterion validity, c) construct validity, d) internal consistency, e) inter-rater reliability, f) test-retest reliability, g) responsiveness, h) recall period, i)

generalizability, and j) ease of administration. The authors determined that the WPAI and the WLQ met more criteria more fully than the other four instruments. The WPAI and WLQ had been tested in more settings and across more diverse populations than the other instruments. In comparing the WPAI and WLQ, the authors determined that the WPAI had been modified for many specific disease populations (e.g., allergic rhinitis, gastro-esophageal reflux, etc.). They also noted that determining a single score of work loss was more difficult with the WLQ because it measures work reduction in specific domains. Another limitation of the WLQ is that it does not quantify the number of hours of days missed from work. Although the authors did not specifically state that the WPAI appeared to meet their criteria better than the WLQ, they did provide more limitations for the WLQ than they did for the WPAI.

WPAI as Most Comprehensive Work Productivity Measure. Overall, all three reviews conclude that the WPAI is one of the best available self-report instruments currently used to assess health-related work production loss, including presenteeism. Each group of authors subjected the instrument to rigorous criteria and deemed it appropriate to use across various populations and for various disorders. Since its inception, researchers have adapted the WPAI for a variety of purposes. One major category of adaptations involves specific diseases. The WPAI is currently available to measure work loss due to Allergic Asthma, Irritable Bowel Syndrome, Psoriasis, Lower Back Pain, Bipolar Disease, and Crohn's Disease (Reilly, 2006). However, the most generalizable form of the WPAI is the General Health version—the WPAI-GH. The WPAI-GH is available in at least thirty-seven languages and dialects, including Danish, Flemish-Belgium, Spanish-US, and Ukrainian (Reilly, 2006).

<p style="text-align: center;">Table 1: Summary of the Recommended Health-Related Workplace Productivity Measurement Instruments, Adapted from Table 3 in Loeppke and colleagues (2003)</p>												
Practicality				Scientific Evidence		Metrics Captured			Applicability			Dec Mak
Name	Ease of Admin	Cost of Admin	Read Level <8 th grade	Multi Lang	Reliability	Validity	Absent-eeism	Present-eeism	Across Ind/Occ	Across Other Diseases	Specific to Migraine	Monetary Unit
EHC	X	X	X	1	Mod	DD	X	X	X	X	X	X
HPQ	X	X	X	29	Mod	UD	X	X	X	X	X	X
SPS-6	X	X	X	1	UD	UD		X	X	X		
WLQ	X	X	X	3	Very High	DDP	X	X	X	X	X	X
WP AI	X	X	UK	13	N/A	DD	X	X		X		X

Key: Admin = Administration; DD = Different Diseases; DDP = Different Diseases and Productivity; Dec Mak = Supports Effective Business Decision Making; Ind/Occ = Industry/Occupation; Multi = Multiple; Read = Reading; UD = Under Development; UK = Unknown

According to Margaret Reilly's website (as accessed in April 2007), the WPAI-GH is a self-report questionnaire that contains six questions. It assesses current employment, hours missed for health problems, hours missed for other reasons, hours worked, how much health affected work productivity, and how much health affected normal activities in the past seven days. The questions result in four scales: "1) absenteeism (work time missed), 2) presenteeism (impairment at work, or reduced on-the-job effectiveness), 3) work productivity loss, and 4) activity impairment." Each scale results in a percentage. For instance, a Presenteeism score of 50% suggests 50% of time spent at work is impaired. Obtaining a score for each scale involves a series of formulas. The questionnaire and guidelines for coding and scoring responses are available at <http://www.reillyassociates.net/>.

Reilly, Zbrozek, and Dukes (1993) published original validity and reliability data for the WPAI-GH. In their study, they administered the WPAI-GH and other questionnaires to 106 employees who had health problems. The other questionnaires had already been tested for construct validity, and they served as validation measures against which to compare the WPAI-GH. They were self-report measures of the following: general health, physical role, emotional role, pain, and symptom severity. Questionnaires also included "global measures of work and interference with regular activity." After completing the questionnaires, participants were then randomized to either complete another set of the same questionnaires, or to receive an interview version of them. According to multivariate linear regression models, the validation questionnaires explained 54% to 64% ($p > 0.0001$) of the variance in the WPAI. This implies fairly good construct validity, although the self-administered questionnaire received less

construct validity (i.e., lower correlation coefficients with the validation measures) than the interview version. Test-retest correlations ranged from .72 to .85.

Objective Measures. Like all self-report measures, the WPAI-GH provides the respondent's reported perceptions. Some people find the subjective nature of self-report instruments undesirable, and they suggest these measures are open to impression-making. Prasad and colleagues (2004) discuss using more objective measures of work productivity. One example they discuss is a computer-based tracking system, or an independent observer who tracks productivity. Two major advantages of objective measurement include decreased recall bias (e.g., consistent, accurate recall over brief or long periods of time) and decreased response bias (e.g., less opportunity for deliberate alterations of recorded work hours).

Unfortunately, objective instruments also possess limitations (Prasad, et al., 2004). First, they are inappropriate for some modern occupations where a specific output number is unrealistic (e.g., factory work with specific number of parts produced vs. receptionist duties). Second, many occupations require both quantity and quality. Quality can be difficult or expensive to quantify through objective measurement. Third, some occupations require cooperation among employees, where no one person can honestly claim credit for work production. Fourth, not all employers agree about the specific method of objective measurement. For instance, some employers prefer absolute measures where the objective system counts the number of production outputs (e.g., number of calls completed). Other employers prefer comparative measures, where the system counts the number of production outputs and compares it to all outputs for everyone on the same shift.

Examples of objective measures used to assess lost work productivity in research studies include the following: daily output records for employees (e.g., Cockburn, et al., 1999), logs of produced units (e.g., Lerner, et al., 2003), absence from work (e.g., Goetzel, et al., 2004; Goetzel, Hawkins, Ozminskowski, & Wang, 2003), short-term disability records (e.g., Goetzel, Hawkins, Ozminskowski, & Wang, 2003), and medical records (e.g., Goetzel, et al., 2004). In other words, when researchers wish to use objective measures of lost work productivity, they use a system that is unique to the work site, and to each occupation studied.

Employer Ratings. In contrast to these objective measures of productivity are employer ratings based on subordinate, supervisor, or peer judgments (Conway & Huffcutt, 1997; Harris & Schaubroeck, 1988; Stevens & Campion, 1999). Such ratings are much less expensive to collect than more objective data, but are open to numerous sources of bias. Conway and Huffcutt (1997) found that supervisor ratings had the highest reliability when compared to the other rating types. However, rather than being “objective,” these sorts of measures typically combine observations of productivity with subjective supervisor judgments of productivity. Rather than being considered “objective” they can best be described as an index of productivity from a source other than the employee. Supervisor ratings of employee performance often form the basis for decisions involving retention and compensation.

Summary. Employee self-report instruments, such as the WPAI-GH, utilize the employee’s perspective regarding his/her lost work productivity. The subjective nature of these instruments is their major limitation. However, objective measures of lost work productivity are also limited. They tend to focus upon records of work absence, health

care utilization, and specific numbers of goods or services produced/provided. These objective records can be expensive to obtain and inappropriate for many employment settings. Employer ratings, despite their limitations, are often used in lieu of these measures.

Because the WPAI-GH is the most empirically-validated measure of work productivity, the WPAI combined with the employment agency's own system of recording productivity (e.g., record of absenteeism, quality controls, supervisor ratings, etc.) would theoretically provide a comprehensive assessment of work productivity. However, this assessment would not include specific details about the reason(s) for lost productivity. For example, if mental health / emotional problems were interfering with an employee's productivity, employers would not necessarily know this by using the WPAI-GH, objective measures, or employer ratings. Including a mental health measure might assist with identifying reasons for lost work productivity.

Clinical Outcome Measurement

As mentioned earlier, Managed Mental Health Care (MMHC) is an unmistakable reality. Like Winegar and Bistline (1994), Lyons and colleagues (1997) compare the MMHC movement to the industrial revolution. They further assert that appropriate patient care will increase with the use of outcome measures. More specifically, they describe how clinical outcome measures can improve the quality and efficiency of mental health treatment. They explain that clinical outcome assessment generally involves characteristics of the consumer / patient, characteristics of the consumer / patient that change over the course of treatment, and changes attributed to the specified treatment. They say outcome measures help a managed care system identify which clients qualify

for which services, how much of each service is needed, and which areas of the system need improvement. Outcome measures also help determine whether patients are receiving a good value. Value is important because cost deters more patients from mental health treatment (e.g., psychotherapy) than it does from other kinds of treatment (e.g., appendectomies).

Lyons and colleagues (1997) indicate that the evaluation of mental health services has been standard practice since the 1960s. During the early stages of mental health service evaluation, evaluations were not used to their fullest extent, in part because data was difficult to collect and compile. Nowadays, computer technology permits easier data collection and analysis. The authors provide a caveat here, suggesting clinical outcomes are only useful if organization leaders are willing to use a bottom-up approach that includes listening to staff members and implementing changes after consensus.

History of the OQ-45

One example of a clinical outcome measure is the Outcome Questionnaire, which Lyons and colleagues (1997) mention in their book. Lambert and colleagues (2004a) describe the Outcome Questionnaire-45.2 (OQ-45) in their Administration and Scoring Manual (Lambert, et al., 2004a). The OQ-45 is a 45-item questionnaire that addresses three domains using three different scales: Symptom Distress (i.e., subjective discomfort or intrapsychic functioning); Interpersonal Relations; and Social Role performance. The authors summarize these domains, stating, “These areas of functioning suggest a continuum covering how the person feels inside, how they are getting along with significant others, and how they are doing in important life tasks, such as work and school.”

The OQ-45 authors suggest administering the questionnaires at specified intervals (e.g., before every therapy session, every few weeks, etc.) Each OQ-45 administration yields a Total score and a score for each of the three scales mentioned above. The higher the score, the more distress or problems the client is reporting. The cut-off score for the OQ-45 Total score is 63/64, where scores 63 and below imply a member of a non-patient population. Cut-off scores for the scales are 36/37 (Symptom Distress), 15/16 (Interpersonal Relations), and 12/13 (SR). The reliable change index for the Total score is 14. A change of 14 points from one administration to another reveals significantly more or less reported distress—depending on the direction of change. Normative data against which to compare scores are available for undergraduate students, community normals, outpatients, and inpatients. The authors also note that the OQ-45 appears to be a useful cross-cultural outcome measure.

The OQ-45 has adequate reliability and validity (Lambert et al., 2004a). The authors reveal that scores for non-clinical community members are stable over time. They also show how scores for those in psychotherapy tend to decrease over time. This steady average decrease suggests clients report fewer symptoms of distress as they continue to work on their problems in therapy. Regarding validity, the authors indicate that concurrent validity for the OQ-45's total and symptom distress scores is statistically significant when using the Pearson product-moment correlation coefficient with other similar questionnaires: Symptom Checklist 90-Revised (SCL-90R); Beck Depression Inventory (BDI); Zung Self-Rating Depression Scale; Zung Self-Rating Anxiety Scale; Taylor Manifest Anxiety Scale; State Trait Anxiety Inventory; Inventory of Interpersonal Problems (IIP); Social Adjustment Scale (SAS); SF 36 Medical Outcome Questionnaire;

and Friedman Well-Being Scale (small patient population). They state that the OQ-45's Interpersonal Relations and SR are less (but still moderately) correlated with other measures of their specific constructs. The OQ-45's construct validity is established through various studies that show total and individual item scores for those receiving treatment tend to decrease over time. Construct validity is also supported by data that shows a significant difference between total score means for those with and without psychopathology.

The OQ-30. Although research shows the OQ-45 is a useful self-report instrument, a shorter instrument might be preferable in certain situations (e.g., for screening purposes). Lambert and colleagues (2004c) describe the Outcome Questionnaire 30.2 (OQ-30), which is a shortened, 30-item version of the OQ-45. The OQ-30 contains the same three scales as the OQ-45. The authors shortened the questionnaire in order to reduce administration time while maintaining as many of the OQ-45's psychometric properties as possible. In order to decide which OQ-45 items would remain in the OQ-30, individual OQ-45 items were tested for their sensitivity to change. Other criteria for item inclusion follow: 1) items address common problems across many disorders; 2) items reflect symptoms that generalize across patients suffering from different disorders; and 3) items address features affecting quality of life. The OQ-30 yields a Total score, with higher scores reflecting more acknowledged distressed. The cut-off score is 43/44, with scores ≥ 44 in the clinical range. The reliable change index is 10. A reduction of ten points from one administration to another implies significantly fewer reported symptoms of distress, and a score ten points higher implies significantly more symptoms. Although the OQ-30 contains three domains of functioning, Lambert

and colleagues (2004c) found through factor analysis that the Interpersonal Relations and SR items mostly overlapped with the Symptom Distress items. For that reason, the authors suggest using the Total score instead of scale scores. Normative data are available for undergraduate students, community volunteers, university counseling center clients, employee assistance program patients, university outpatient clinic patients, community mental health center patients, and inpatients.

Lambert and colleagues (2004c) indicate that the test-retest reliability (i.e., Pearson product-moment coefficient) for the OQ-30 is .84. The internal consistency (i.e., coefficient alpha) for both the student and patient populations is .93. All coefficients in their studies were significant at the .01 level of confidence. Concurrent validity (i.e., Pearson product-moment) coefficients ranged between .593 to .698 when the OQ-30 was compared to the SCL-90R, IIP, SAS, and BDI. These coefficients suggest moderately high concurrent validity. Regarding sensitivity to change, the authors explain that twenty-seven of the 30 items on the OQ-30 clearly demonstrate change over time for those undergoing psychotherapy. These items do not change significantly for patients who do not undergo psychotherapy. (The three items that did not demonstrate sensitivity assessed either interpersonal difficulties or substance abuse.) Like the OQ-45, means on the OQ-30 are significantly different for clinical and non-clinical populations, adding support to construct validity.

The SOQ. The Severe Outcome Questionnaire 2.0 (SOQ) is a relatively new instrument, and is still undergoing validity and reliability testing. The SOQ is also labeled the Life Status Questionnaire (LSQ) at the Utah State Hospital (please see Appendix D). *The Administration and Scoring Manual for the Severe Outcome*

Questionnaire (Burlingame, Lee, Nelson, & Lambert, 2007) describes the limited information available at this time. The SOQ is comprised of the OQ-30, plus 15 items designed to assess severe mental illness. Three preliminary internal consistency reliabilities are available for three different populations: non-patient students (0.9432), inpatients (0.9515), and outpatients (0.952). In general, mean scores are higher in patient populations than in the non-patient students, suggesting effective discrimination between the two groups. Given the available data, mean scores do not effectively discriminate between inpatient and outpatient populations, perhaps because inpatients (many of whom are committed to treatment) tend to underreport symptomatology. Regarding validity, the SOQ total score was significantly correlated with the total scores of three other mental health measures: Behavior and Symptom Identification Scale (.901), Brief Psychiatric Rating Scale—Extended version (.431), and Nurses' Observation Scale for Inpatient Evaluation (correlation unavailable at this time). The available correlations suggest good concurrent validity. The current study will provide data so future researchers can determine more precise validity and reliability information.

Burlingame and colleagues (2007) suggest two methods of interpreting the SOQ. First is individual item evaluation, especially evaluation of critical items like Item 7. Item 7 reveals the patient's reported level of suicidal thoughts. Items 11, 20, and 24 indicate substance abuse, and items 31-45 reflect severe mental illness. The second method of interpretation involves the SOQ Total score. A higher score (over 44, when using OQ-30 data) indicates many symptoms of distress, as well as difficulties in the interpersonal, social role / work, and quality of life realms. The authors have not

identified scales for the SOQ at this point, since research is limited. However, the SOQ contains all items of the SR as it appears in the other OQ versions.

The SR. The OQ creators designed the Social Role scale (SR) to assess functioning at work, at school, and in other social roles. The items on this scale are included in all versions of the OQ that are discussed in this paper. The five SR items follow, with their accompanying numbers as shown on the SOQ in Appendix D:

3. I feel stressed at work, school, or other daily activities.
9. I find my work/school or other daily activities satisfying.
22. I am not working/studying as well as I used to.
24. I have trouble at work/school or other daily activities because of drinking or drug use.
27. I feel that I am not doing well at work/school or in other daily activities.

Since work includes work production, the SR might assess both mental health status and work productivity. Two PacifiCare researchers used the SR as included in the OQ-30 to determine lost work productivity.

SR As a Measure of Work Productivity

In a series of presentations (i.e., Brown, 2005; Brown & Jones, 2005; and Jones, 2005), Dr. Jeb Brown and Dr. Edward Jones describe their use of the SR at PacifiCare Behavioral Health (PBH). PBH is a large Western mental health company based in California. At PBH, they studied work impairment with the OQ-30 (which they called the Life Status Questionnaire, or LSQ). They used the five SR items (which they collectively labeled the Functional Impairment Scale, or FIS) under the assumption that these items tap the construct of work functionality (Brown & Jones, 2005). The authors estimated that every point on the scale represents one to two hours' worth of work productivity, and, thus, improvement of scores on this scale could be translated into gains in work productivity.

These authors used four years' worth of PBH data to study the relationship between SR scores and mental health treatment (Brown and Jones, 2005). Participants responded to each item using a Likert scale score, where 0 was "Never," and 4 was "Almost Always." The authors considered a respondent "dysfunctional" at work if his/her SR score totaled more than 10 (Brown & Jones, 2005). In their tested population, 31% of respondents earned intake scores that placed them in the dysfunctional range. However, after three weeks of mental health treatment, clients improved to where only 17% were in the dysfunctional range. After nine weeks of treatment, only about 12% were dysfunctional. In other words, on average, participants improved by 1.6 SR points following treatment.

The authors have created a system by which they calculate work productivity and estimate return on investment (ROI) rates by translating SR points into work productivity hours. They call this Microsoft Excel-based system of work productivity estimation the Productivity Calculator (Brown, 2005; Brown & Jones, 2005; Jones, 2005). Brown and Jones (2005) explain that work productivity is assumed to co-vary with the SR; however, they do not know to what extent the two co-vary. These researchers suggest each point on the SR represents 1-2 hours of work productivity, although they admit the 1-2 hours is an estimate, based on assumptions from the professional literature.

The Productivity Calculator (Brown, 2005; Brown & Jones, 2005; Jones, 2005) allows the user to enter several "Assumptions," to include the following: "Covered lives," "% accessing care," "% of members accessing care that are employees," "Functional Impairment Scale at Intake," "Average Annual Employee cost (salary and benefits)," "Average Cost of Treatment," "Average Annual Cost of outpatient MH benefit," "%

indirect impact of dependent's improvement on employees productivity,” “Productivity increase (hours per week) per point improvement on FIS,” and “Average Improvement on FIS.” For “Productivity increase (hours per week) per point improvement on FIS,” the Calculator allows the user to enter alternative estimated hours. The intake SR (FIS) score can then be included as a predictor variable in a regression equation. The Productivity Calculator creators indicate future research will provide more clear assumptions about the particular number of work productivity hours each SR point represents and, thus, better estimates of the effects of treatment on work productivity.

Although the PBH study is promising in that it shows how mental health treatment can positively impact work productivity, the study has weaknesses. The PBH data is currently unpublished in scholarly journals. This means few scientists have had access to it, and peer review has not been accomplished. Additionally, the authors do not provide data to support their assumption that the SR does, indeed, measure work productivity (or a lack thereof). In essence, their suggestion that the Productivity Calculator actually estimates work impairment needs verification. Before the authors promote the Productivity Calculator, a link between the SR and work productivity needs to be established. This link could increase confidence in the assumption that specific increments of improvement in mental health is likely to lead to specific increased increments of improvement in work productivity.

Validation of the SOQ as a Measure of Work Productivity

The current study examines possible relationships among the SOQ and WPAI, as well as objective measures of work productivity already collected by a multidisciplinary workplace setting. Using the SOQ allows for analyzation of SOQ, OQ-30, and SR scores.

The WPAI was used because the literature identified it as one of the best available employee self-report instruments to assess work productivity. Because a standardized objective instrument is not readily applicable to most workplace sites, results from the SOQ and WPAI were compared to the work productivity measures the selected workplace setting had already designated for each of its disciplines.

Although the SOQ is a clinical outcome measure, no mental health treatment was administered during this study. In other words, this study did not directly study improvement in mental health or improvement in productivity, but it is a step towards linking mental health treatment and increased work productivity. It provides data that can be used to help calculate the cost/benefit of psychotherapy, as was begun with the Productivity Calculator (Brown, 2005; Brown & Jones, 2005; Jones, 2005). Hopefully, this study will lead to further investigations that will allow employers, insurance companies and government agencies and policy makers to see the degree of overall positive impact continued mental health treatment can have upon their employees and in their companies, as well as society.

CHAPTER 3

METHODS

Participants

All Utah State Hospital (USH) employees from the Nursing, Occupational Therapy, Psychology, Recreational Therapy, and Social Work departments (130 potential participants), as well as all USH patient industrials (150 potential participants), were asked to participate. Patient industrials are USH inpatients who hold jobs on the USH campus as part of their treatment through Vocational Rehabilitation. Potential participants were either asked in person by the primary investigator, or via email and follow-up written invitation. Of the 280 potential participants, 90 (approximately 32%) agreed to participate at least one month. Sixty-two were employees, and 28 were patient industrials. Thirty-eight individuals participated in April; 55 in May; 47 in June; and 51 in July 2007. This means 101 sets of responses were repeated measures, as only 90 individuals participated. Participation in this study was voluntary, and participants received no direct compensation.

Reported ages of participants ranged from 18 to 73. Three individuals opted not to provide their ages. Twenty-six participants were between the ages of 18 and 38 (about 30%), 53 between 41 and 58 (about 61%), and 8 between 59 and 73 (about 9%). One participant (about 1%) reported a first language of Chinese, while all other participants reported English (about 99%). Fifty participants were female (about 56%), 39 were male (about 44%), and one chose not to provide his/her gender. Eighty-one participants reported being Caucasian, and nine reported other races. Please see Table 2 for detailed

information about races, and Tables 3 through 6 for a break-down of other demographic information.

Table 2: Races of Participants		
Race	Total	Percent (Rounded)
Asian	2	2
Black	1	1
Caucasian	81	90
Hispanic	2	2
Native American	2	2
Puerto Rican	1	1
Samoan Caucasian	1	1

Table 3: Marital Status of Participants		
Marital Status	Total	Percent (Rounded)
Divorced	15	17
Engaged	2	2
Married	49	55
Single	19	21
Widowed	4	4

Note: One participant chose not to disclose marital status.

Table 4: Education Level of Participants		
Education Level	Total	Percent (Rounded)
Some School (No high school degree or GED)	4	4
GED	2	2
High school degree	8	9
Some college	16	18
Associates Degree	1	1
Technical Degree	8	9
Bachelor's Degree	26	29
Graduate Degree	24	27

Note: One participant chose not to disclose education level.

Medical Problems	Total	Percent (Rounded)
0	29	36
1	20	25
2	13	16
3	5	6
4	10	12
5	3	4
6	1	1

Note: Nine participants chose not to disclose number of medical problems.

Mental Health Problems	Total	Percent (Rounded)
0	31	39
1	28	35
2	12	15
3	4	5
4	3	4
5	1	1

Note: Eleven participants chose not to disclose number of mental health problems.

Measures

The SOQ measured self-reported mental health symptoms, and the WPAI measured self-reported work productivity. In order to direct participants' responses to matters involving mental health, the WPAI-GH was modified to reflect mental health functioning instead of general health functioning. Please see Appendix C. This modified WPAI-GH is referred to herein as the WPAI. An additional questionnaire requested demographic information. Please see Appendix E.

Work productivity measures for USH employees were discipline-specific, and included measures the USH already collected periodically. The Discipline Director of each discipline (i.e., Nursing, Occupational Therapy, Psychology, Recreational Therapy, and Social Work departments) indicated which measures best reflected work productivity

in their particular disciplines. Information about the presence, timeliness, and quality of routine paperwork was gathered as measures of work productivity. Table 7 indicates which types of documentation were associated with each discipline. The number of sick hours employees used per month (i.e., number of hours missed due to reported illness) was collected as a measure of absenteeism. Please see Table 7.

Supervisor ratings were gathered for patient industrials as a measure of work productivity. Please see Appendix F, which is a copy of the standard timesheet for patient industrials. In the bottom left part of the document, supervisors marked whether patient industrials met pre-determined criteria for the specified two-week work period. No measure of absenteeism was available for patient industrials.

Procedures

Discipline Directors from five USH departments (i.e., Nursing, Occupational Therapy, Psychology, Recreational Therapy, and Social Work) and the Vocational Rehabilitation counselors introduced the primary investigator to employees and patient industrials, respectively. The primary investigator then recruited participants. Discipline Directors and Vocational Rehabilitation counselors received no direct compensation for their efforts. The primary investigator provided those who wished to participate with a packet containing all study documents (i.e., informed consent, SOQ, WPAI, and request for demographic information).

Table 7: USH Work Productivity Measures by Discipline					
Work Productivity Measure	Discipline				
	Nursing	Psychology	Recreational Therapy	Social Work	Occupational Therapy
Sick Hours (Provided by HR)	Sick hours used per month	Sick hours used per month	Sick hours used per month	Sick hours used per month	Sick hours used per month
Presence (Determined by QR, except OT, which was determined by AD)	Nursing Assessments	Group Therapy Notes	Patient Assessments	TAN Notes	PST Hours
	Weekly notes		PST Hours	Admission Notes	Patient Group Attendance
	TAN notes		Treatment Plan	Social Histories	Screening Assessments
	PIRS notes				
Timeliness (Determined by QR, except OT, which was determined by AD)	Nursing Assessments due within 8 hours of admission	Group notes due within 7 days	Patient Assessments due within 14 days of admission	TAN notes due every 7 days for the first 8 weeks, then every 30 days	Not Applicable
	Weekly notes due every 7 days		PST due within 7 days of activity	Admission notes due within 72 hours	Not Applicable
	TAN notes due every 28 days		Treatment Plan due within 14 days	Social histories due within 14 days of admission	Screening assessments due within 72 hours
	PIRS notes due constantly				
Quality	Determined by QR	Determined by QR	Determined by QR	Determined by QR	Not Applicable
Notes: AD = Discipline Director; HR = Human Resources Department; OT = Occupational Therapy; PIRS = Patient Incident Reporting System notes; PST = Planned Scheduled Treatment; QR = Quality Resources Department; TAN = Treatment Assessment Notes.					

After receiving the packet, participants were asked to read and sign informed consent (Appendices A and B), write their names and USH Employee Identification Numbers on it, and seal it in an envelope labeled "Consent." Participants then completed the SOQ and WPAI, provided demographic information, sealed all documents in a provided self-addressed stamped envelope, and mailed the envelope to the primary investigator. Instead of mailing their responses, some participants opted to have the primary investigator pick-up their responses in person, in order to further facilitate confidentiality. Participants were asked to complete the questionnaires once per month, for four months; however, employee and patient industrial turnover hindered some participants from completing four months' worth of data. Additionally, the Psychology and Occupational Therapy departments did not begin participation until May and June 2007, respectively.

One participant denied access to work productivity information the USH already collected by checking an optional box on the informed consent; however, all other participants allowed access to this information. The primary investigator accessed USH work productivity data through the Quality Resources Department, the Discipline Directors, and the Human Resources Department. In order to protect confidentiality, an independent undergraduate student worked with data from the Psychology discipline because the primary investigator already had a professional relationship with most of those participants.

If any participant experienced discomfort or embarrassment while completing the documents, (s)he had the option of withdrawing from the study at anytime without jeopardizing his/her position or treatment at the USH.

Confidentiality. Because professionals and patients were both involved in this study, confidentiality procedures included extra precaution in order to protect the unique vulnerabilities of each population. After volunteering, employees provided their names and USH employee identification numbers (EINs) on only their informed consent documents. Names and EINs were entered into a secure database on a computer on the USH campus. A random, three-digit participant study number (PSN) was linked to each of the sets of names and USH employee numbers. This database was password-protected in Microsoft Excel, within the secure system. PSNs were entered into a separate, password-protected database on the primary investigator's computer. Thus, PSNs removed from the USH campus were not connected with names or USH EINs. Patients provided only their names on the informed consent, as they did not have EINs.

All documents given to participants after the first administration included a PSN so that no personal information was included. Only the primary investigator knew what the PSN meant. All participants were specifically asked to NOT include their names or other identifying information on any document except the informed consent. Participants then directly mailed the documents to the primary investigator in a sealed envelope, or requested that the primary investigator personally pick-up their responses. Supervisors and employers had no access to any participant's responses. Only individuals directly associated with analyzing the data had access to responses, and only the primary investigator had access to names and EINs. All responses were kept in a locked filing cabinet in a locked room. All paper documents, the electronic database containing employee names and EINS, and the second database containing participant numbers and responses, were destroyed/deleted by 15 April 2008.

Utah law requires the primary investigator to report any suspected or actual abuse, neglect, or exploitation of a child, an adult 65 or older, or an adult who has a mental or physical impairment, which affects that person's ability to provide for or protect him/herself. If the primary investigator had a reason to believe that such abuse, neglect, or exploitation had occurred, she would have reported this to Child Protective Services (CPS), Adult Protective Services (APS), or the nearest law enforcement agency. No information related to such problems was found in the data collected for this study.

If an employee indicated on the SOQ that (s)he "frequently" or "almost always" experienced suicidal thoughts, the primary investigator contacted the participant directly and recommended (s)he call the USH's Employee Assistance Program (EAP) representative Brent Johnson at 1 (801) 538-4216, or that (s)he contact an Emergency Room after hours. If a patient indicated (s)he "frequently" or "almost always" experienced suicidal thoughts, the primary investigator contacted his/her Unit Nursing Director (UND) on his/her behalf. In order to contact a specific patient's UND, the primary investigator contacted the Nursing Discipline Director (Chris Metcalf at 801-344-4258) and provided the patient's name. The Nursing Discipline Director then supplied the UND's name and contact information. Two employees and two patients indicated suicidal thoughts and were contacted according to the protocols just described.

CHAPTER 4

RESULTS

The three-digit participant study number (PSN) located on each document indicated which participant had completed them across the four months. Most participants provided the date on each questionnaire, which indicated the month documents were completed. For documents without a reported date, the month listed on other participants' questionnaires received in the mail simultaneously was assigned.

Data Preparation

The following information was entered into an Excel spreadsheet for each PSN: demographic information (i.e., age, first language spoken, gender, marital status, education level, race, number of medical problems, and number of mental health problems). The following scores were also entered for each month, April through July 2007: SOQ Total Score, OQ-30 Total Score, SR Score, WPAI Absenteeism Score, WPAI Presenteeism Score, WPAI Work Productivity Loss Score, WPAI Activity Impairment Score, Supervisor Ratings for patient industrials, and USH discipline-specific data for employees (i.e., Presence, Timeliness, and Quality of documentation). It should be noted that all employees' documents were present. As a result, the Presence of documentation was not used as a data point in this study due to lack of variability.

Each discipline included different numbers and types of documentation. In order to facilitate consistency across disciplines, Timeliness was entered as a single ratio for each participant. This ratio reflected number of late notes per total notes expected for that individual. For example, a ratio of 1/4 (or 0.25) indicated one late note out of four total notes. Quality was also entered as a ratio. Documents either did or did not meet

quality standards according to the Quality Resources Department. Quality Resources determines whether many documents meet specified criteria for quality. In this instance, the ratio 1/4 indicated one note out of the four total types did not meet quality standards. Higher ratios indicate lower levels of work productivity. Supervisor Ratings for patient industrials were also entered as a ratio, which indicated the number of expectations reached (e.g., Punctual, Works Independently) to the number of expectations (i.e., 12 or 24, depending on how many pay periods the individual worked that month). In contrast to Timeliness and Quality, higher Supervisor Ratings ratios indicate higher levels of work productivity.

Analysis of employee SOQ, OQ-30, and SR Total scores indicate a Pearson product-moment correlation coefficient of 0.97 between the SOQ and OQ-30 Total scores, 0.83 between the SOQ Total and SR scores, and 0.86 between the OQ-30 Total and SR scores. Analysis of patient industrial SOQ, OQ-30, and SR Total scores indicate correlation of 0.97 between the SOQ Total and OQ-30 Total scores, 0.82 between the SOQ Total and SR scores, and 0.82 between the OQ-30 Total and SR scores. When including both populations in the analysis, Pearson product-moment correlation coefficients verify the SOQ Total score and OQ-30 total score were highly correlated ($r = 0.97$) with one another. Additionally, the SR score was highly correlated with both the SOQ Total score ($r = .79$; the SR predicted 62% of the SOQ's variance), and with the OQ-30 Total score ($r = .83$; the SR predicted 69% of the SOQ's variance). Correlations this high indicate these three scores essentially reflect the same concept, which is unsurprising since the OQ-30 and SR scores are sub-scores derived from the SOQ. In order to analyze the data without correlation interference, only the SR score was

compared to the other collected data. The SR was chosen because it focuses on work-role functioning and can be readily applied to the Productivity Calculator.

The *Administration and Scoring Manual for the Severe Outcome Questionnaire* (Burlingame, et al., 2007) provides an inclusion criterion for inpatients completing the SOQ. Because normative data from community samples provide a mean Total Score of 36, data from patient industrials was searched for any data sets including a Total SOQ score less than 36, as this is a cut score. Seven data sets from April, four from May, three from June, and two from July 2007 contained invalid SOQ scores, and were removed from the data set. The SOQ Manual also includes a table suggesting estimates of SOQ scores, given OQ-30 scores. Two participants in May 2007, and two in June 2007, did not complete the last 15 items of the SOQ, so SOQ estimates were assigned based on the OQ-30 scores. However, because SOQ scores were not used in the final analyses, providing these estimates was inconsequential.

Statistical Analyses

Quantitative Analysis. A mixed models analysis of covariance (ANCOVA), with repeated measures, was used to analyze all employee data, and all WPAI scores for patient industrials. This statistic was chosen because all four months contain both repeated measures and independent data sets. A mixed models analysis controls for variance from the same subject on the same measure across two or more months, and accounts for random variance from participants who completed questionnaires only one month.

Another reason mixed models ANCOVA was chosen involves statistical power. Many other statistical operations require a large number of participants for appropriate

statistical power. This requirement is particularly problematic for this study, as only 90 individuals participated overall, and no more than 55 individuals participated each month (i.e., April $n = 38$; May $n = 55$; June $n = 47$; and July $n = 51$). Too few data points were collected per month to warrant using statistics requiring power to compare each month's data. Due to this inability to compare data by month, a variable called "Time" was added in order to enter the data as a one-time "snapshot" of responses while still accounting for how responses can change from one time to the next. Time was a continuous variable which increased as each month passes. If Time predicted a variable, the variable increased or decreased as time passed.

Work productivity was predicted using the mixed models ANCOVA, with repeated measures. Because work productivity measures included scores, ratios, and percentages, combining all work productivity data into one score for each participant was not feasible. Therefore, each work productivity measure was predicted separately, using SR scores. First, demographic variables were entered for each work productivity measure to see whether any of these variables accounted for variation in work productivity scores. After adjusting for demographic information, the SR score was added to see whether it predicted any work productivity measure after accounting for demographic information. Data for employees and patients were run separately, as their respective objective work productivity measures were too different to compare directly.

Results of analyses for employees are presented in Table 8. Three of the four WPAI scales were reliably predicted. More specifically, as the WPAI Presenteeism score increased, the SR score and the number of reported mental health problems increased significantly. As the WPAI Work Productivity Loss score increased, so did the number

of mental health problems reported. As the WPAI Activity Impairment score increased, so did the SR score and the number of mental health problems reported. No variable reliably predicted the WPAI Absenteeism score. Only one of the objective work productivity measures—Quality of documentation—was reliably predicted. Age decreased significantly as Quality increased. Additionally, the Quality of Documentation of those with a High School Degree was significantly different than those with a Technical Degree ($p = 0.0002$) or a Graduate Degree ($p < 0.0001$). High school graduates produced the lowest quality documents (Least Squares Mean Estimate = 0.79, $p < 0.0001$), while those with a Technical Degree (Least Squares Mean Estimate = -0.07) or a Graduate Degree (Least Squares Mean Estimate = 0.08) produced the highest quality documents. No variable reliably predicted the number of Sick Hours used, or the Timeliness of documentation.

Significant Predictors	Work Productivity Measure
SR ($p < 0.0001$), Mental Health Problems ($p = 0.05$)	Presenteeism (WPAI Scale)
No p value ≤ 0.05	Absenteeism (WPAI Scale)
Mental Health Problems ($p = 0.01$)	Work Productivity Loss (WPAI Scale)
SR ($p < 0.0001$), Mental Health Problems ($p < 0.0001$)	Activity Impairment (WPAI Scale)
No p value ≤ 0.05 .	Sick Hours Used
No p value ≤ 0.05 .	Timeliness of Documentation
Education ($p < 0.0001$), Age ($p = 0.0001$)	Quality of Documentation

Results for patient industrials are presented in Table 9. For this population, the SR did not reliably predict any WPAI scale; however, demographic variables predicted

two of these scales. Gender predicted the WPAI Presenteeism scale, as women scored significantly higher than men. Three variables reliably predicted the WPAI Activity Impairment score: Gender, the number of reported Mental Health Problems, and Education level. Like Presenteeism, women scored significantly higher than men on the Activity Impairment scale. Participants reporting a higher number of Mental Health Problems scored significantly higher on the Activity Impairment scale. Regarding education, those with a High School Degree had the highest WPAI Activity Impairment scores, and those with a Bachelor's Degree had the lowest scores. No variable reliably predicted the WPAI Absenteeism or Work Productivity Loss scores.

Significant Predictors	Work Productivity Measure
Gender (p = 0.04)	Presenteeism (WPAI Scale)
No p value \leq 0.05.	Absenteeism (WPAI Scale)
No p value \leq 0.05.	Work Productivity Loss (WPAI Scale)
Gender (p = 0.01), Mental Health Problems (p = 0.02), Education (p = 0.05)	Activity Impairment (WPAI Scale)

Of interest, most predictors were themselves correlated with one another. Table 10 provides the Pearson Correlation coefficient, significance value, and sample size of each relationship when including both employees and patient industrials in the analysis. Table 11 and Table 12 provide the same analyses, except separated for each population. The variables Marital Status and Gender were not included in these analyses, as they are categorical. Education Level was retained in the analyses because it includes a natural progression despite forced categories.

Table 10: Correlations, Significance Values, and Sample Sizes of Predictors, Employees and Patient Industrials Combined				
	Medical Problems	Mental Health Problems	Age	Education
Medical Problems	r = 1.0	r = 0.44	r = 0.14	r = -0.11
	p = N/A	p = <.0001*	p = 0.01*	p = 0.05*
	n = 324	n = 304	n = 316	n = 324
Mental Health Problems	r = 0.44	r = 1.0	r = -0.21	r = -0.26
	p = <.0001*	p = N/A	p = 0.0002*	p = <.0001*
	n = 304	n = 316	n = 308	n = 316
Age	r = 0.14	r = -0.21	r = 1.0	r = 0.20
	p = 0.01*	p = 0.0002*	p = N/A	p = 0.0002*
	n = 316	n = 308	n = 348	n = 344
Education	r = -0.11	r = -0.26	r = 0.20	r = 1.0
	p = 0.05*	p = <.0001*	p = 0.0002*	p = N/A
	n = 324	n = 316	n = 344	n = 356
Note: * denotes significance value ≤ 0.05 .				

Table 11: Correlations, Significance Values, and Sample Sizes of Predictors, Employees Only				
	Medical Problems	Mental Health Problems	Age	Education
Medical Problems	r = 1.0	r = 0.34	r = 0.23	r = -0.30
	p = N/A	p = <.0001*	p = 0.0005*	p = <.0001*
	n = 236	n = 220	n = 228	n = 236
Mental Health Problems	r = 0.34	r = 1.0	r = -0.03	r = 0.01
	p = <.0001*	p = N/A	p = 0.63	p = 0.84
	n = 220	n = 224	n = 216	n = 224
Age	r = 0.23	r = -0.03	r = 1.0	r = 0.17
	p = 0.0005*	p = 0.63	p = N/A	p = 0.01*
	n = 228	n = 216	n = 240	n = 240
Education	r = -0.30	r = 0.01	r = 0.17	r = 1.0
	p = <.0001*	p = 0.84	p = 0.01*	p = N/A
	n = 236	n = 224	n = 240	n = 248
Note: * denotes significance value ≤ 0.05 .				

Table 12: Correlations, Significance Values, and Sample Sizes of Predictors, Patient Industrials Only				
	Medical Problems	Mental Health Problems	Age	Education
Medical Problems	r = 1.0	r = 0.51	r = 0.06	r = 0.51
	p = N/A	p = <.0001*	p = 0.55	p = <.0001*
	n = 88	n = 84	n = 88	n = 88
Mental Health Problems	r = 0.51	r = 1.0	r = -0.25	r = 0.12
	p = <.0001*	p = N/A	p = 0.2	p = 0.24
	n = 84	n = 92	n = 92	n = 92
Age	r = 0.06	r = -0.25	r = 1.0	r = -0.00
	p = 0.55	p = 0.02*	p = N/A	p = 0.97
	n = 88	n = 92	n = 108	n = 104
Education	r = 0.51	r = 0.12	r = -0.00	r = 1.0
	p = <.0001*	p = 0.24	p = 0.97	p = N/A
	n = 88	n = 92	n = 104	n = 108

Note: * denotes significance value ≤ 0.05 .

As was presented earlier in this chapter, the SR did not reliably predict any work productivity measure for patient industrials. However, for employees, the SR predicted two measures quite well. The Estimate values for the Solution for Fixed Effects indicates that, for every one point increase in the SR score, the WPAI Presenteeism score increases 3.4 percentage points, and the WPAI Activity Impairment score increases 3.8 percentage points. Age reliably predicted one work productivity measure for employees. For every one-year increase in age, the ratio of documents not meeting quality standards to total documents written increased 0.02 (meaning lower quality). The number of mental health problems predicted three WPAI scores for employees, and one for patient industrials. Estimate values indicate that, for every mental health problem employees reported, the Presenteeism score increased 3.9 percentage points, the Work Productivity Loss score increased 1.6 percentage points, and the Activity Impairment score increased 11.0

percentage points. For patient industrials, every reported mental health problem increased the Activity Impairment score by 10.0 percentage points. Please see Table 13.

	Work Productivity Measure	Solution for Fixed Effects Estimate (Predictor)
Employees	Presenteeism (WPAI Scale)	3.4 (SR)
		3.9 (MHP)
	Work Productivity Loss (WPAI Scale)	1.6 (MHP)
	Activity Impairment (WPAI Scale)	3.8 (SR)
		11.0 (MHP)
Quality of Documentation	0.02 (Age)	
Patient Industrials	Activity Impairment (WPAI Scale)	10.0 (MHP)

Notes: SR = Social Role Scale; MHP = Mental Health Problems; Age = Age of Participants.

In order to determine whether the self-reported WPAI Scales correlated with USH objective work productivity measure, the Pearson product-moment correlation coefficient was used to correlate all four WPAI Scales (i.e., Presenteeism, Absenteeism, Work Productivity Loss, and Activity Impairment) with each objective work productivity measure for employees (i.e., Sick Hours Used, Timely, and Quality). The objective measure Supervisor Ratings was not included in this analysis, due to lack of variance in that variable. The only two measures which correlated significantly were Sick Hours Used and the WPAI Presenteeism Scale. Please see Table 14.

Case Analysis of an Outlier. Supervisor Ratings comprised the objective work productivity measure for patient industrials—that is, the measure not derived from the self-reported WPAI. For Supervisor Ratings, only one patient received a less-than-

Table 14: Correlations, Significance Values, and Sample Sizes of Objective and Self-Report Work Productivity Measures for Employees				
USH WP Measure	WPAI Absenteeism	WPAI Presenteeism	WPAI Work Productivity Loss	WPAI Activity Impairment
Sick Hours Used	r = 0.10	r = 0.18	r = 0.09	r = 0.12
	p = 0.23	p = 0.03*	p = 0.31	p = 0.14
	n = 152	n = 140	n = 141	n = 144
Timeliness	r = -0.08	r = -0.20	r = -0.04	r = -0.26
	p = 0.61	p = 0.23	p = 0.84	p = 0.12
	n = 41	n = 36	n = 36	n = 37
Quality	r = 0.03	r = 0.06	r = -0.00	r = 0.05
	p = 0.78	p = 0.53	p = 1.00	p = 0.63
	n = 114	n = 104	n = 105	n = 106

Note: * denotes significance value < 0.05.

perfect ratio of expected behaviors (i.e., ratio of 0.96) in April 2007. All other patient industrials received full credit every month they participated (i.e., ratio of 1.0). This solitary ratio was examined qualitatively in lieu of running a statistic that requires variability in the data. In the same month this female participant earned a Supervisor Rating ratio of 0.96, she obtained a SR Scale score of seven, a WPAI Absenteeism score of 100, and a WPAI Activity Impairment score of 90. No WPAI Presenteeism or Work Productivity Loss scores were available because this participant did not complete the fifth WPAI question, which asks for a rating (0-10 scale) of how much “mental health problems or psychological distress” affected productivity while working. Because no answer to the fifth item was available, the Presenteeism and Work Productivity Loss scores were unscorable.

This participant’s SR score of seven is below the cut-off of 12/13 as described in the *Administration and Scoring Manual for the OQ-45.2* (Lambert, et al., 2004a). Her score implies she experienced a subclinical amount of distress or problems at work or in

other social role activities. The Absenteeism score indicates she reported missing work every day (100% of the time) due to her mental health problems. Additionally, the Activity Impairment score suggests her mental health problems impaired 90% of her non-work-related activities. Overall, these scores suggest her mental health problems were significant enough to both hinder her from work attendance, and impair her participation in other activities. Her SR score might be subclinical because she did not participate in work activities, resulting in a score that does not reflect the distress she would have felt had she participated. However, she did participate in other social role activities, perhaps resulting in enough distress to warrant a score of seven.

CHAPTER 5

DISCUSSION

The purpose of this study was to move closer to an estimation of the relationship between improved mental health and workplace functioning. The current study examined relationships among a self-report measure of mental health (i.e., the Social role Scale [SR] of the Severe Outcome Questionnaire [SOQ]), a self-report measure of work productivity (i.e., the Work Productivity and Activity Impairment Questionnaire [WPAI]), and objective measures of work productivity (i.e., the quality and timeliness of institutional records, supervisor ratings, and sick hours used). It was thought that understanding the relationships among these measures might assist in estimating the cost/benefit of investing in psychotherapy, as was begun with the Productivity Calculator (Brown, 2005; Brown & Jones, 2005; Jones, 2005). Participants in this study were employees and inpatients at the Utah State Hospital. Statistical analyses indicated the SR did predict two WPAI scales for employees.

Employees

The SR score reliably predicted the WPAI Presenteeism and Activity Impairment Scale scores for employees. This relationship between the SR and WPAI is complementary to previous research in which a variety of physical and emotional health scales explained variance in the WPAI (i.e., Reilly, Zbrozek, & Dukes, 1993). This relationship also establishes concurrent validity for the SR as a measure of work productivity—specifically, presenteeism. As the SR does appear to measure presenteeism adequately, the SR can now be used more confidently when calculating the cost/benefit of investment in mental health treatment using the Productivity Calculator.

In other words, the link Brown and Jones (2005) assumed existed between the SR and work productivity has now been empirically supported.

Productivity Calculator. The mixed models ANCOVA Solution for Fixed Effects Estimates—3.4 and 3.8 for the WPAI Presenteeism and Activity Impairment Scales, respectively—are increases in the variables for every one-point increase on the SR. These Estimates are percentages because the WPAI Scales scores are percentages. In order to input these numbers into the Productivity Calculator’s “Productivity increase (hours per week) per point improvement on FIS,” employers will need to make some decisions. First, employers should determine the number of hours per week their employees work. Edward Jones (2005, March) indicates the Productivity Calculator provides Return on Investment (ROI) estimates at both the company level, and the individual employee level. Using an average number of hours per week for all employees would be appropriate. For the sake of illustration, 40 hours per week will be used as an example.

Second, employers should decide which of the two WPAI scales is most important to them. If employers hope to decrease presenteeism, using the SR Estimate 3.4 would be most relevant, whereas 3.8 would be most appropriate if employers hope to provide interventions for non-work-related functioning. In our example, 3.4 will be used to illustrate an employer who hopes to provide mental health treatment geared toward increasing work efficiency. Forty hours times 0.034 (3.4% as a decimal) is 1.36. This result is the number to input in the Productivity Calculator as “Productivity increase (hours per week) per point improvement on FIS.”

Table 15 provides a hypothetical Productivity Calculator Excel output of calculating the ROI of mental health treatment. The 1.36 productivity increase per SR (or FIS, as listed in the Calculator) point automatically rounded to 1.4. For this example, the company covered 5,000 lives, and the resulting company-wide ROI is 220%. The ROI for each employee is 363%.

Table 15: Hypothetical Example of Productivity Calculator, Using 1.36 (Automatically Rounded to 1.4; highlighted) SR Score	
Assumptions	
Covered lives	5000.00
% accessing care	4.0%
% of members accessing care that are employees	65%
Functional Impairment Scale at Intake	11.0
Average Annual Employee cost (salary and benefits)	\$60,000
Average Cost of Treatment	\$550.00
Average Annual Cost of outpatient MH benefit	\$30.00
% indirect impact of dependent's improvement on employees productivity	50%
Productivity increase (hours per week) per point improvement on FIS	1.4
Calculated productivity gain	
Average Improvement on FIS	2.1
Average Annualized Productivity Gain	3.33%
Cost benefit calculations	
<i>Patient level</i>	
Value of productivity increase due to treatment (per patient)	\$1,998.97
Return on Investment (per patient)	363%
<i>Company level</i>	
Value of productivity increase due to treatment company wide	\$329,829.76
Cost of benefit	\$150,000.00
Return on Investment company wide	220%

Demographic Variables. Compared to the SR, the number of mental health problems employees reported on the Demographic Information questionnaire predicted an additional WPAI Scale (i.e., Work Productivity Loss). In other words, the number of reported mental health problems reliably predicted the WPAI Presenteeism, Work Productivity Loss, and Activity Impairment Scales. This finding makes sense because a general census of mental health problems is likely associated with a wider variety of problems than the SR, which estimates the amount of disturbance one feels in work and leisure activities. Perhaps surprisingly, the number of mental health problems did not predict Absenteeism. This may mean participants in this sample tended to work at a limited capacity in lieu of taking a leave of absence.

Reported education level and age both predicted the USH objective work productivity measure Quality of Documentation, which was determined by the USH Quality Resources office. This finding suggests there was enough variability in the Quality data, and a large enough sample size, to find relationships that exist. Participants with less education (i.e., High School Degree) produced lower quality documents, perhaps because they had fewer opportunities in school to learn professional styles of documentation than did those with higher levels of education (i.e., Technical Degree and Graduate Degree). The reason other participants with higher levels of education (e.g., Bachelor's Degree) did not produce higher Quality documents is unclear. Perhaps future research can address this issue.

Regarding Age, the finding that younger employees produced higher quality documents is perhaps the opposite of what one might expect. However, as professionals age, it is possible that they become comfortable writing notes and eventually produce

shorter, or less thorough, documents. This phenomenon may be analogous to observer drift in naturalistic research. Observer drift occurs when trained observers conceptualize code definitions differently across time, which compromises the validity of data they report observing (Smith, 1986). Continual monitoring and periodic retraining have been proposed as ways to diminish observer drift (Reid, 1982), and these interventions may help in this context.

For employees, no variable reliably predicted the USH objective work productivity measures Sick Hours Used or Timeliness of Documentation. This suggests demographics did not influence these two variables, and the SR did not tap these concepts. However, it should be noted that few disciplines required that their records be turned in by a certain due date. The Timeliness data in this study included few participants and, therefore, lacked a sufficient number of data points. This lack of data might have contributed to the null findings.

Patient Industrials

Statistical analyses for patient industrials suggest mixed findings. Unlike findings for employees, the SR did not reliably predict any work productivity measure for inpatients. However, demographic variables did reliably predict two WPAI scales. For instance, the number of reported mental health problems reliably predicted the WPAI Scale Activity Impairment: patients reporting a higher number of Mental Health Problems scored significantly higher on the WPAI Activity Impairment Scale. This finding implies patients with more mental health issues experienced more problems in non-work activities. This finding suggests inpatients with comorbid disorders tended to experience more severe functional impairment, as was found in a longitudinal study by

Newman, Moffitt, and Silva (1996). In their study, Newman and colleagues followed their participants from birth to age 21. By age 21, almost half of the participants had comorbid disorders, and those experiencing comorbidity were more severely impaired. An interesting twist on comorbidity in the current study is that patients with a higher number of reported mental health problems did not report more problems completing their industrial tasks. Their ability to complete industrial position duties despite higher numbers of mental health issues may be related to the sense of satisfaction, as well as monetary compensation, associated with completing them. In other words, they may gain self-esteem from completing their industrials, and, therefore, force themselves to complete their duties.

Patient industrials with a High School Degree had the highest WPAI Activity Impairment scores, and those with a Bachelor's Degree had the lowest scores. The reason for this relationship is unclear, as there was not a trend for lower educated to perform differently than more educated.

For patient industrials, women scored significantly higher than men on the WPAI Presenteeism and Activity Impairment Scales. These findings suggest women were more likely than men to report significant impairment at work and in other activities, due to mental health problems. One possible reason for this gender-specific finding is that traditional gender roles portray men as less open about their emotions. Context has been shown to affect emotion characteristics in men and women (e.g., Kelly & Hutson-Comeaux, 1999), and inpatient status may well be a context in which women are more likely to be open about their emotional problems.

No variable reliably predicted the WPAI Absenteeism or Work Productivity Loss Scale scores. More specifically, the Absenteeism Scale rose approximately 2.45 percentage points with each one-point increase in the SR ($p = 0.23$). Race predicted the Absenteeism Scale at the 0.15 level of significance; however, this finding may have emerged since 90% of participants were Caucasian, thus skewing the results. The variables closest to predicting the Work Productivity Loss Scale were the SR and Time. The Work Productivity Loss Scale rose about 1.5 points with each one-point increase in the SR, and it rose approximately 3.29 points with each month that passed ($p = 0.20$).

Time

The variable Time did not reliably predict any work productivity measure, indicating no work productivity measure changed significantly as time passed. This suggests work productivity did not significantly increase or decrease across the four months for employees or inpatients. It also suggests that, despite the possibility of summer vacations, employees did not use a significant number of sick hours in June or July for this purpose.

Employer Interventions

Although this study was conducted in order to determine whether the SR can predict work productivity, results suggest several possible interventions employers could use to increase productivity in their employees. To increase the quality of institutional records employees create, employers could provide less-educated employees (e.g., those with a high school degree) with an opportunity to gain education. For instance, Fenton (2004) describes several types of employer-provided education benefits. These benefits include tax-free education benefits, scholarships, stipends, and fringe benefits. However,

some employers may consider these options unnecessarily expensive. Alternatively, employers could provide training for how to create high-quality documents in their specific disciplines. Because age increase also negatively impacted Quality, employers might consider providing workshops for older employees. Workshops could include recalibration of document-writing skills, with specific feedback regarding areas needing improvement.

Female inpatients reported difficulty working efficiently (i.e., Presenteeism). Mary Ellen Guy (1993) described five examples of employer interventions that may encourage women in the workplace: “flex-time, on-site or near-site childcare, employee assistance programs, off-site workplaces, and personal development opportunities.” It should be noted that USH patient industrials already had ready access to inpatient mental health treatment (which is more intense than that available through an employee assistance program), the opportunity to work off-campus (off-site workplace), and various personal development opportunities (e.g., Recreational Therapy, Occupational Therapy, and other therapies). They may have benefited from more flexible work hours, and more time to see their children. Of course, work hours and child availability cannot always be changed. Other employment agencies with mentally ill employees may do well to keep these examples in mind.

Inpatients in this study also reported problems in non-work-related activities (as measured by the WPAI Activity Impairment scale) if they were female, experienced a higher number of mental health problems, or had a high school degree. Suggestions for helping women, and those with less education, were discussed above. Regarding the number of mental health problems, many people might predict that mentally ill

individuals—especially those with more psychiatric problems—would experience more problems outside of work. However, it is possible that patients perceive their industrial positions as yet another life stressor. Providing extra emotional support may be beneficial for these individuals. For example, supervisors or assigned psychotherapists could dedicate a specific time to meet with each patient industrial and process his/her emotional obstacles. Employers hiring mentally ill employees can consider providing these individuals with additional emotional support.

Learning Culture Organization

Collecting data in order to improve productivity, quality, profitability, or morale is part of what Lyons and colleagues (1997) label a “learning culture organization.” They list four necessities regarding use of outcomes in a learning culture organization: 1) formal methods of identifying what data should be collected; 2) formal methods of collecting fair and accurate data; 3) formal data analysis strategies (and interpretations that can be understood from a variety of perspectives); and 4) formal methods of executing changes suggested by data interpretation.

The USH, and perhaps other multidisciplinary workplace settings, could use the results of this study to promote a learning culture organization. For instance, employers could 1) decide to use the SR in order to determine their employees’ mental health status and potential for lost work productivity; 2) periodically collect SR responses from all employees in a standardized, respectful manner; 3) score and analyze SRs and identify who earned significantly high scores; and 4) provide mental health treatment to employees with significantly high scores. Theoretically, this strategy would reduce the amount of work productivity that is lost due to mental health problems like depression.

Using the Productivity Calculator to estimate ROI may bolster confidence in providing mental health treatment.

Limitations

One potential limitation in this study involves the number of sick hours participants used: this variable may not be valid as a measure of objective absenteeism. D. Gardner (personal communication, August 2007), USH Human Resources Director, explained employees are typically motivated to use sick hours when they are ill, although they could potentially use sick hours instead of annual leave or other types of leave. Also, employees may decide to use sick hours simply because they choose to leave work. This is possible because, if an employee works more than 40 hours in one week, that person cannot use sick hours during that same week, suggesting they would personally benefit most from using sick hours instead of saving them. Another reason USH employees tend use sick leave is because they cannot “cash out” sick leave, but can other types of leave. Overall, future researchers should fully consider institution policies before using sick leave as an important source of work productivity data. They may also wish to confirm that their chosen objective measures are as valid as possible, so that collected data unequivocally reflects work productivity.

Another limitation in this study is that only one of the self-reported WPAI Scales was significantly correlated with an objective measure the USH used. This finding is a potential limitation in that it implies the WPAI was not necessarily a valid measure of what the USH considers work productivity, or visa versa. Additionally, the WPAI Scale that was significantly correlated with a USH measure is conceptually contradictory, as sick hours measured absenteeism, and the WPAI Scale measured Presenteeism. The

reasons that objective measures of documentation (i.e., quality and timeliness) did not correlate well with WPAI scales is unclear. The WPAI Absenteeism Scale might not have correlated with USH measures because the Absenteeism Scale asks specifically for the number of hours missed from work due to mental health problems. Perhaps those using USH sick hours missed work due to physical problems, not mental health problems. If future researchers are interested in using the WPAI only if it correlates with objective institutional measures of work productivity, they may wish to collect preliminary data to determine whether WPAI scales predict the objective measures.

Another limitation involves the lack of variability and lack of consistency in the objective data. Some data was homogeneous, indicating little to no variability within the variable. For example, the variable Presence of Documentation—whether employees' documents existed—was completely homogeneous, as all participants completed their documents. Patient industrialists' supervisor ratings were almost completely homogeneous in that only one inpatient received a less-than-perfect score. The one score that deviated from the others was evaluated qualitatively because lack of variability hindered quantitative analysis. In future research, objective measures chosen should naturally include variability within the population, so that homogeneity does not interfere with statistical analyses.

The objective USH data also lacks consistency across disciplines. Most notably, the Occupational Therapy discipline produced no data which could be evaluated for its quality, and only one of three types of documentation had a specific due date to evaluate for timeliness. Additionally, the objective work productivity measures were presented as ratios because the disciplines used different types and numbers of documentation. The

Psychology discipline had only one type of documentation to evaluate for quality and timeliness, while the Nursing discipline had four types of documentation. Future researchers asking participants from different disciplines to participate would likely benefit from using only variables (e.g., Quality or Timeliness) for which each discipline can provide data. The same type and number of data types would be ideal, but perhaps not realistic in practice.

A general limitation in this study is the small sample size, which limited the type of statistic used. Future researchers should utilize a larger pool of participants. Researchers would also do well to increase generalizability by using employees from a variety of work settings (e.g., manufacturers vs. service providers, large corporations vs. small businesses, etc.). Despite the limitations described in this section, the SR did reliably predict the WPAI Presenteeism and Activity Impairment Scales for employees in this study. Replication and further investigation of the SR as a measure of work productivity is recommended.

Personal Reactions

While completing this study, the first author learned that work productivity is discussed more in the business and Industrial/Occupational Psychology literature than it is in the Clinical Psychology literature. This study will hopefully contribute to the literature clinical psychologists consult so they are better informed of the important phenomenon of presenteeism, and how it affects work productivity. This researcher also discovered that mental health treatment can, indeed, increase work productivity, and that employers might be willing to use an OQ measure if doing so is profitable. On a practical level, this researcher experienced frustration when attempting to identify

objective work productivity measures, as they were inconsistent across disciplines.

Consulting a statistician helped relieve the stress involving analyses of the sketchy data set. Despite experiencing stress capable of making this researcher the epitome of presenteeism, completing the study described herein was certainly worthwhile.

Appendix A: Consent Document for Employees

Consent to be a Research Subject

Purpose

The purpose of this study is to determine how emotional/mental health affects a person's ability to work. Vinessa K. Trotter, a doctoral candidate, is conducting this research at Brigham Young University as part of her doctoral dissertation. You were chosen because "community normal" data is needed from individuals like you who are employed at a facility that already collects work productivity information.

Procedures

You will be asked to complete three questionnaires once per month, for four months. The process should take about 30 minutes each time. These questionnaires will ask you about the number of hours you worked in the past 7 days, how you have been feeling physically and emotionally, how your emotional/mental health might have affected your work, etc. One questionnaire will also ask you about demographic information. After completing the questionnaires, please return them in the provided self-addressed, stamped envelope marked "Questionnaires." Please seal your signed consent form in the envelope Marked "Consent." After I receive your packet, I will incorporate data that the USH tracks on your work performance (e.g., sick days and the presence, timeliness, and quality of routine documentation). Up to 330 individuals are expected to participate in this study.

Risks/Discomforts

Your risks for participating in this study are minimal. However, it is possible you may feel uncomfortable or embarrassed answering questions concerning your emotional/mental health. Data collected on your work productivity for this study will not be made available to USH supervisors or administrators as a part of any employee review or rating process. There is always a possibility of confidentiality breach in studies like this one; however, I am taking steps to ensure this possibility is minute. For instance, only this consent form will contain personally identifying information (i.e., your USH Employee number and your signature), and this document will be kept in a locked room in a locked cabinet away from the USH campus once I receive it. All other documents will contain your subject number—no personal information. I have included a self-addressed, stamped envelope so you can seal your responses immediately and mail them directly to me. This gives you the power to ensure no one sees your responses except you and those directly associated with analyzing the data. All your responses will be entered into a password-protected database in a secure server. This secure database will be separate from the secure database that contains your personal information. All questionnaires and databases will be destroyed once the study is complete.

Benefits

It is hoped that, through your participation, researchers will learn more about how emotional health affects work productivity.

Confidentiality

Each document in your packet has a number on it. This is your subject number. I gave you this number, which will be linked to your Utah State Hospital Identification Number, so I can look up your work history here at the USH while keeping your answers to the questionnaires confidential. No one but the researcher will know what your subject number means. All information you provide will remain confidential and will only be reported as aggregate (group) data with no identifying information about you or your specific jobs. The USH administration will not access any data for individuals or specific jobs unless legally required to do so. I ask that you do NOT include any identifying information, such as your name or social security number, except your signature and USH employee identification number on this consent form. Once you complete the questionnaires, you can seal them in the addressed, stamped envelope I provided. Again, your supervisor and employer will NOT have access to them. All questionnaires will be kept in a locked storage cabinet. All of your responses, and all other information linking you to your responses, will be destroyed by 15 April 2008. If you indicate you “frequently” or “almost always” have suicidal thoughts, I will intervene by contacting you directly.

Additionally, Utah law requires me to report any suspected or actual abuse, neglect, or exploitation of a child, an adult 65 or older, or an adult who has a mental or physical impairment, which affects that person’s ability to provide for or protect him/herself. If I have reason to believe that such abuse, neglect, or exploitation has occurred, I will report this to Child Protective Services (CPS), Adult Protective Services (APS), or the nearest law enforcement agency.

Participation

Participation in this research study is voluntary. You have the right to withdraw at anytime or refuse to participate entirely without jeopardy to your standing with, or employment at, the Utah State Hospital.

Questions about the Research

If you have questions regarding this study, you may contact Vinessa K. Trotter at BYU Comprehensive Clinic, 1190 North 900 East, Provo, UT 84602-3536; 801-422-4050; vkj2@byu.edu. If you feel uncomfortable contacting Ms. Trotter, you may contact her BYU faculty mentor, Michael Lambert, Ph.D. His contact information is 801-422-6480; michael_lambert@byu.edu. If you prefer contacting a USH internal resource, please direct questions to Dr. Frank Rees; 801-344-4203; frees@utah.gov.

Questions about your Rights as Research Participants

If you have any questions regarding your rights as a participant in this research project, you may contact Dr. Renea Beckstrand, Chair of the Institutional Review Board, 422 SWKT, Brigham Young University, Provo UT, 84606; phone 422-3873; email renea_beckstrand@byu.edu. You may also contact the DHS IRB by calling Gary Franchina at (801) 538-4109 or GFRANCHINA@utah.gov.

I have read the description of this study and I freely volunteer to participate. I understand that I can withdraw from the study at any time and that my position at the Utah State Hospital will not be negatively affected in any way by my decision to withdraw.

~ I do not grant permission for Ms. Trotter to access work productivity information that the USH already collects about me.

Signature: _____ Date: _____

USH Employee Identification Number: _____

Appendix B: Consent Document for Patient Industrials

Consent to be a Research Subject

Purpose

I am conducting research to see how emotional health affects work productivity. My name is Vinessa K. Trotter, and I am a graduate student at Brigham Young University. I am conducting this research as part of my school work (my doctoral dissertation). I need data from people like you who work at a place that already collects work productivity information, so I am asking for your help.

Procedures

I will ask you to fill out three questionnaires once every month, for four months. Filling out the questionnaires should take you about 30 minutes each time. These questionnaires will ask you things like how many hours you worked in the past week, how you have been feeling physically and emotionally, and how your emotional health has affected your work. One questionnaire will also ask you some specific information (like your age and your job). After you finish filling out the questionnaires, please seal this consent form in the envelope marked “Consent.” Then find the envelope that says “Questionnaires” and put the “Consent” envelope and the questionnaires in it. After I receive your envelope, I will compare your responses to supervisor ratings that the Utah State Hospital already has about you. I think up to 330 people will participate in this study.

Risks/Discomforts

You probably won't have any problems while participating in this study. However, you might feel uncomfortable or embarrassed when answering some of the questions about your emotional health. This is normal. If you feel too uncomfortable, though, you can stop filling out the questionnaires at any time. USH administrators and your USH supervisor will not have access to your responses about work, so those responses will not affect your job in any way. In studies like this one, it is always possible someone who should not see your answers could see them. However, I am taking steps to make sure this is very unlikely. For example, your name and USH Identification number will only be on this consent form, and this form will be kept in a locked room in a locked cabinet away from the USH campus. The questionnaires will not have any personal information on them—just your subject number. I gave you an envelope so you can seal your responses immediately and mail them directly to me. This gives you the power to make sure no one sees your responses except you and those who will directly analyze your responses. All your responses will be kept in a password-protected database in a secure server. This secure database will be separate from the secure database that contains your personal information. All questionnaires and databases will be destroyed once the study is complete.

Benefits

I hope that researchers will learn more about how emotional health affects work productivity by looking how you and others respond to these questionnaires.

Confidentiality

Each document in your packet has a number on it. This is your subject number. I gave you this number, which will be linked to your Utah State Hospital Identification Number, so I can look up your supervisor ratings while keeping your answers to the questionnaires confidential. I am the only one who will know what your subject number means. All of your responses will be confidential. I will only report responses as group data, and will not include any identifying information about you or your specific job. Utah State Hospital administrators and your supervisor will not see any information about you or your job unless they are legally required to do so. I ask that you do NOT include any identifying information, such as your name or social security number, except your signature and USH identification number on this consent form. Once you complete the questionnaires, you can seal them in the envelope I gave you. Again, your supervisor and employer will NOT have access to them. All questionnaires will be kept in a locked storage cabinet. All of your responses, and all other information that could link you to your responses, will be destroyed by 15 April 2008. If you say you “frequently” or “almost always” have thoughts of ending your life, I will contact your Unit Nursing Director in order to assure you do not hurt yourself.

Additionally, Utah law requires me to report any suspected or actual abuse, neglect, or exploitation of a child, an adult 65 or older, or an adult who has a mental or physical impairment, which affects that person’s ability to provide for or protect him/herself. If I have reason to believe that such abuse, neglect, or exploitation has occurred, I will report this to Child Protective Services (CPS), Adult Protective Services (APS), or the nearest law enforcement agency.

Participation

Participation in this research study is voluntary. You can withdraw at anytime or refuse to participate entirely without jeopardy to your standing with, or treatment at, the Utah State Hospital.

Questions about the Research

If you have questions regarding this study, you may contact Vinessa K. Trotter at BYU Comprehensive Clinic, 1190 North 900 East, Provo, UT 84604-3536; 801-422-4050; vkj2@byu.edu. If you feel uncomfortable contacting me, you may contact my BYU faculty mentor, Michael Lambert, Ph.D. His contact information is 801-422-6480; michael_lambert@byu.edu. If you prefer contacting someone at the USH, please contact Dr. Frank Rees; 801-344-4203; frees@utah.gov.

Questions about your Rights as Research Participants

If you have any questions about your rights as a participant in this study, you may contact Dr. Renea Beckstrand, Chair of the Institutional Review Board, 422 SWKT, Brigham Young University, Provo UT, 84606; phone 422-3873; email renea_beckstrand@byu.edu. You may also contact the DHS IRB by calling Gary Franchina at (801) 538-4109 or GFRANCHINA@utah.gov.

I have read the description of this study and I freely volunteer to participate. I understand that I can withdraw from the study at any time and that my treatment at the Utah State Hospital will not be negatively affected in any way by my decision to withdraw.

~ I do not grant permission for Ms. Trotter to access supervisor ratings that the USH already collects about me.

Signature: _____

Date: _____

USH Identification Number: _____

Appendix C

Work Productivity and Activity Impairment Questionnaire: V2.0 (WPAI), Adapted from WPAI-GH

The following questions ask about the effect of your mental health problems on your ability to work and perform regular activities. By mental health problems, we mean any emotional problem or symptom (e.g., psychological distress like sadness/depression, anxiety, bipolar disorder, hallucinations/schizophrenia). Mental health problems can also be short-lived (e.g., distress resulting from marital problems or illness in your family), but they can still affect your ability to work in the past seven days. *Please fill in the blanks or circle a number, as indicated.*

1. Are you currently employed (working for pay)? _____ NO _____ YES
If NO, please do not complete this survey.

The next questions are about the **past seven days**, not including today.

2. During the past seven days, how many hours did you miss from work because of your mental health problems or psychological distress? *Include hours you missed on sick days, times you went in late, left early, etc., because of your physical or mental health problems. Do not include time you missed to participate in this study.*

_____ HOURS

3. During the past seven days, how many hours did you miss from work because of any other reason, such as vacation, holidays, time off to participate in this study?

_____ HOURS

4. During the past seven days, how many hours did you actually work?

_____ HOURS *(If "0", skip to question 6.)*

5. During the past seven days, how much did your mental health problems or psychological distress affect your productivity while you were working?

Think about days you were limited in the amount or kind of work you could do, days you accomplished less than you would like, or days you could not

do your work as carefully as usual. If mental health problems or psychological distress affected your work only a little, choose a low number. Choose a high number if mental health problems affected your work a great deal.

Consider only how much mental health problems or psychological distress affected productivity while you were working.

Health problems had no effect on my work	<hr style="width: 100%;"/> 0 1 2 3 4 5 6 7 8 9 10	Health problems completely prevented me from working
--	---	--

CIRCLE A NUMBER

6. During the past seven days, how much did your mental health problems or psychological distress affect your ability to do your **regular daily activities**, other than work at a job?

By regular activities, we mean the usual activities you do, such as work around the house, shopping, childcare, exercising, studying, etc. Think about times you were limited in the amount or kind of activities you could do and times you accomplished less than you would like. If physical or mental health problems affected your activities only a little, choose a low number. Choose a high number if health problems affected your activities a great deal.

Consider only how much mental health problems or psychological distress affected your ability to do your regular daily activities, other than work at a job.

Health problems had no effect on my daily activities	<hr style="width: 100%;"/> 0 1 2 3 4 5 6 7 8 9 10	Health problems completely prevented me from doing my daily activities
--	---	--

CIRCLE A NUMBER

Appendix D: Severe Outcome Questionnaire (SOQ)

LIFE STATUS QUESTIONNAIRE (OQ30)

Instructions: Looking back over the last week, including today, help us understand how you have been feeling. Read each item carefully and mark the box under the category which best describes your current situation. For this questionnaire, work is defined as employment, school, housework, volunteer work, and so forth.

USH ID# _____ Date ____/____/____	Never	Rarely	Sometimes	Frequently	Almost Always
1. I have trouble falling asleep or staying asleep	0	1	2	3	4
2. I have no interest in things	0	1	2	3	4
3. I feel stressed at work, school or other daily activities	0	1	2	3	4
4. I blame myself for things	0	1	2	3	4
5. I am satisfied with my life	4	3	2	1	0
6. I feel irritated	0	1	2	3	4
7. I have thoughts of ending my life	0	1	2	3	4
8. I feel weak	0	1	2	3	4
9. I find my work/school or other daily activities satisfying	4	3	2	1	0
10. I feel fearful	0	1	2	3	4
11. I use alcohol or a drug to get going in the morning	0	1	2	3	4
12. I feel worthless	0	1	2	3	4
13. I am concerned about family troubles	0	1	2	3	4
14. I feel lonely	0	1	2	3	4
15. I have frequent arguments	0	1	2	3	4
16. I have difficulty concentrating	0	1	2	3	4
17. I feel hopeless about the future	0	1	2	3	4
18. I am a happy person	4	3	2	1	0
19. Disturbing thoughts come into my mind that I cannot get rid of	0	1	2	3	4
20. People criticize my drinking (or drug use)	0	1	2	3	4
(if not applicable, mark "never")					
21. I have an upset stomach	0	1	2	3	4
22. I am not working/studying as well as I used to	0	1	2	3	4
23. I have trouble getting along with friends & close acquaintances.....	0	1	2	3	4
24. I have trouble at work/school or other daily activities because of drinking or drug use (if not applicable, mark "never").....	0	1	2	3	4
25. I feel that something bad is going to happen	0	1	2	3	4
26. I feel nervous	0	1	2	3	4
27. I feel that I am not doing well at work/school or in other daily activities	0	1	2	3	4
28. I feel something is wrong with my mind	0	1	2	3	4
29. I feel blue	0	1	2	3	4
30. I am satisfied with my relationships with others	4	3	2	1	0

Life Status Questionnaire Cont.

	Never	Rarely	Sometimes	Frequently	Almost Always
31. I see or hear things that other people don't	0	1	2	3	4
32. I can't stop talking, moving or doing things	0	1	2	3	4
33. I have been told by others that my behavior is out of control	0	1	2	3	4
34. I must do things like wash my hands or hurt myself to feel better.....	0	1	2	3	4
35. I have difficulty with my unstable moods	0	1	2	3	4
36. My temper leads me to act without thinking, or say things that I don't mean	0	1	2	3	4
37. I am not in control of my life	0	1	2	3	4
38. I am forgetful	0	1	2	3	4
39. I have been told that I have difficulty keeping myself neat and clean	0	1	2	3	4
40. I think people are trying to make it difficult for me to succeed	0	1	2	3	4
41. I feel confused	0	1	2	3	4
42. I have difficulty completing my household chores like shopping, cooking and cleaning	0	1	2	3	4
43. I think I am really ill	0	1	2	3	4
44. I have problems making daily decisions	0	1	2	3	4
45. I have difficulty keeping jobs or managing money	0	1	2	3	4

Appendix E

Demographic Information

Instructions: For question 1, please write your age in the space provided. This study is designed to keep your answers confidential, so please do NOT include your name. Thank you!

1. Age _____

Instructions: For questions 2 – 6, please fill in the circle beside your answer. If your answer is “Other,” please write the correct information on the line.

2. What is your first (native) language?
- Chinese
 - English
 - Japanese
 - Spanish
 - Other _____
3. What is your gender
- Female
 - Male
4. What is your marital status?
- Divorced
 - Married
 - Separated
 - Single
 - Other _____
5. What is the highest level of education you completed?
- Some High School. Specify which grade you completed: _____
 - GED
 - High School Degree
 - Some College
 - Technical Degree
 - University (4-year) Degree
 - Graduate Degree
 - Other _____
6. What is your Race/Ethnicity?
- Asian
 - Black/African American
 - Hispanic
 - Native American
 - Tongan
 - White/Caucasian
 - Other _____

Instructions: For questions 7 and 8, please list the requested information on the lines.

7. Do you suffer from any medical/physical problems that you know of? If so, please list them. _____

8. Do you suffer from any mental health/emotional problems that you know of? If so, please list them. _____

Appendix F: Patient Industrial Timesheet with Supervisor Rating Items

This form is to be completed (all sections) by the work location supervisor every two weeks on every patient working in his/her area.

Patient Name: _____ Social Security Number: _____ / _____ / _____
 Unit: _____ Pay Period Start: _____ Work Location: _____
 Pay Period Finish: _____ Job Tasks: _____

DATE	SUPERVISED					TOTAL	DATE	SUPERVISED					TOTAL
	IN	OUT	IN	OUT	BY			IN	OUT	IN	OUT	BY	
1							16						
2							17						
3							18						
4							19						
5							20						
6							21						
7							22						
8							23						
9							24						
10							25						
11							26						
12							27						
13							28						
14							29						
15							30						
							31						

Column 1 Total _____

Column 2 Total _____

Rate: _____ Total Hours: _____ Total Pay: _____

- Circle One
1. Grooming neat & clean Yes No
 2. Punctual Yes No
 3. Good Attendance Yes No
 4. Gets along with supervisor and peers Yes No
 5. Motivation is good Yes No
 6. Works Independently Yes No
 7. Has a good attention span Yes No
 8. Has a good work tolerance Yes No
 9. Quality is good Yes No
 10. Quantity is good Yes No
 11. Has good frustration tolerance Yes No
 12. Has self confidence Yes No

Comments: _____

13. Changes in patient since last report & progress towards vocational treatment goals: _____

Supervisor Signature: _____ Date: _____

Patient Signature: _____ Date: _____

Distribution of forms: White – Payroll, Yellow – Medical Record, Pink – Work location supervisor

Appendix G: Article for Journal Submission (Journal
of Occupational and Environmental Medicine)

MEASURING WORK PRODUCTIVITY WITH A MENTAL
HEALTH SELF REPORT MEASURE

Vinessa K. Trotter, B.S., Brigham Young University.

Michael J. Lambert, Ph.D., Brigham Young University.

Gary M. Burlingame, Ph.D., Brigham Young University.

Frank Rees, Ph.D., Utah State Hospital.

Bruce Carpenter, Ph.D., Brigham Young University.

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Aaron Jackson, Ph.D., Brigham Young University.

Dennis Eggett, Ph.D., Brigham Young University.

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Mail to Department of Psychology; Brigham Young University; 272 TLRB; Provo, Utah
84602. Telephone (801) 422-6480. Fax (801) 422-0602. Email to
michael_lambert@byu.edu.

Financial support for this study was provided by the Brigham University Psychology
Department and Dr. Michael J. Lambert's research fund.

Abstract

- Objective: Determine whether the Social Role Scale (SR) of the Outcome Questionnaire (OQ) can predict work productivity.
- Methods: Employees at a Western state hospital completed the OQ and the Work Productivity and Activity Impairment Scale (WPAI) once monthly for four months.
- Results: The SR predicted the WPAI scales Presenteeism and Activity Impairment.
- Conclusions: The SR can be used to estimate work productivity using tools like the Productivity Calculator. Specific relationships among measures, and suggestions for future research, are discussed.

Clinical Significance

The results of this study provide an avenue to estimate work productivity loss via the Social Role Scale (SR) of the Outcome Questionnaire. Employers can enter this information into the Productivity Calculator to determine the cost/benefit of investing in mental health treatment for employees with higher SR scores.

Introduction

Mental health problems, especially depressive disorders, can lead to loss of work productivity. Allen^[1] argues that an employer's main concern regarding mental health issues is productivity. Not surprisingly, Lyons and colleagues^[2] indicate that some important reasons to assess clinical outcome are to increase work productivity, and to decrease absenteeism, on-the-job accidents, and employee turnover. Goetzel, Ozminkowski, Sederer, and Mark^[3] assert that about one out of every ten Americans suffers from a depressive disorder during a given year. This statistic is troubling because depression often remains undiagnosed and untreated. In their review of the literature, these authors found that depressed employees can cost their employers up to 70% more in physical health care costs than non-depressed employees. Employees with mental disorders utilize medical care services more frequently, and utilize more expensive treatments, than do employees who have no significant impairments in their mental health. Langlieb and Kahn^[4] reviewed the literature and cited one estimate by the World Health Organization that predicts depression will be the second overall cause of disability by the year 2020. Comorbidity complicates the problem because depression and anxiety often occur simultaneously.^[4]

Employees suffering from mental health problems tend to cost employers money through loss of work productivity (i.e., absenteeism, presenteeism, short-term disability, turnover, etc).^[3,4,5] Absenteeism is a traditional way to estimate work productivity loss.^[4] Absenteeism refers to the number of days or hours the employee missed at work. However, Langlieb and Kahn^[4] describe another phenomenon: presenteeism. Presenteeism occurs when an employee is mentally or physically "ill" but still goes to

work. The employee works, but at a limited capacity. Presenteeism results in work production loss that is more elusive than loss resulting from absenteeism.

Self-Report of Work Productivity and Mental Health Status

The WPAI. To conduct research on work productivity and mental health, quantifying these concepts is an absolute necessity. Prasad and colleagues^[6] discuss two major approaches to measuring work productivity, one of which is through the employee's self-report. Three sets of authors^[6,7,8] have published reviews of work productivity instruments used in research on the impact of physical disability. All three reviews conclude that the Work Productivity and Activity Impairment Questionnaire (WPAI) is one of the best available self-report instruments used to assess health-related work production loss, including presenteeism. Each group of authors subjected the instrument to rigorous criteria and deemed it appropriate to use across various populations and for various disorders. Since its inception, researchers have adapted the WPAI for a variety of purposes. One major category of adaptations involves specific diseases. The WPAI is currently available to measure work loss due to Allergic Asthma, Irritable Bowel Syndrome, Psoriasis, Lower Back Pain, Bipolar Disease, and Crohn's Disease.^[5] However, the most generalizable form of the WPAI is the General Health version—the WPAI-GH. The WPAI-GH is available in at least thirty-seven languages and dialects, including Danish, Flemish-Belgium, Spanish-US, and Ukrainian.^[5]

According to Margaret Reilly's website,^[5] the WPAI-GH is a self-report questionnaire that contains six questions. It assesses current employment, hours missed for health problems, hours missed for other reasons, hours worked, how much health affected work productivity, and how much health affected normal activities in the past

seven days. The questions result in four scales: “1) absenteeism (work time missed), 2) presenteeism (impairment at work, or reduced on-the-job effectiveness), 3) work productivity loss, and 4) activity impairment.” Each scale results in a percentage. For instance, a Presenteeism score of 50% suggests 50% of time spent at work is impaired. Obtaining a score for each scale involves a series of formulas. The questionnaire and guidelines for coding and scoring responses are available at <http://www.reillyassociates.net/>.

Reilly, Zbrozek, and Dukes^[9] published original validity and reliability data for the WPAI-GH. In their study, they administered the WPAI-GH and other questionnaires to 106 employees who had health problems. The other self-report questionnaires were previously-validated measures of general health, physical role, emotional role, pain, and symptom severity. Questionnaires also included “global measures of work and interference with regular activity.” According to multivariate linear regression models, the validation questionnaires explained 54% to 64% ($p > 0.0001$) of the variance in the WPAI. This implies fairly good construct validity. Test-retest correlations ranged from .72 to .85.

The SOQ. The Severe Outcome Questionnaire 2.0 (SOQ) is a self-report questionnaire designed to measure mental health status. The SOQ is a relatively new instrument, and is still undergoing validity and reliability testing. *The Administration and Scoring Manual for the Severe Outcome Questionnaire*^[10] describes the limited information available at this time. The SOQ contains 45 items. The first 30 items address three domains using scales: Symptom Distress (i.e., subjective discomfort or intrapsychic functioning); Interpersonal Relations; and Social Role performance. The

last 15 items are designed to assess symptoms of severe mental illness. See Appendix A. Three preliminary internal consistency reliabilities are available for three different populations: non-patient students (0.9432), inpatients (0.9515), and outpatients (0.952). In general, mean scores are higher for patient populations than in the non-patient students, suggesting effective discrimination between the two groups. Given the available data, mean scores do not effectively discriminate between inpatient and outpatient populations, perhaps because inpatients (many of whom are committed to treatment) tend to underreport symptomatology. Regarding validity, the SOQ total score was significantly correlated with the total scores of three other mental health measures: Behavior and Symptom Identification Scale (.901), Brief Psychiatric Rating Scale—Extended version (.431), and Nurses' Observation Scale for Inpatient Evaluation (correlation unavailable at this time).^[10] The available correlations suggest good concurrent validity. The current study will provide data to help determine more precise validity and reliability information.

The SR. The OQ creators designed the Social Role scale (SR) to assess functioning at work, at school, and in other social roles.^[10] The five SR items follow, with their accompanying numbers as shown in Appendix A:

3. I feel stressed at work, school, or other daily activities.
9. I find my work/school or other daily activities satisfying.
22. I am not working/studying as well as I used to.
24. I have trouble at work/school or other daily activities because of drinking or drug use.
27. I feel that I am not doing well at work/school or in other daily activities.

Since work includes work production, the SR might assess both mental health status and work productivity. Two PacifiCare researchers used the SR to determine lost work productivity.

SR As a Measure of Work Productivity

In a series of presentations, Dr. Jeb Brown and Dr. Edward Jones describe their use of the SR at a large Western mental health company based in California.^[11,12,13] At this facility, they studied work impairment with the five SR items under the assumption that these items tap the construct of work functionality.^[12] The authors estimated that every point on the scale represents one to two hours' worth of work productivity, and, thus, improvement of scores on this scale could be translated into gains in work productivity.

These authors used four years' worth of data to study the relationship between SR scores and mental health treatment.^[12] Participants responded to each item using a Likert scale score, where 0 was "Never," and 4 was "Almost Always." The authors considered a respondent "dysfunctional" at work if his/her SR score totaled more than 10.^[12] In their tested population, 31% of respondents earned intake scores that placed them in the dysfunctional range. However, after three weeks of mental health treatment, clients improved so that only 17% were in the dysfunctional range. After nine weeks of treatment, only about 12% were dysfunctional. In other words, on average, participants improved by 1.6 SR points following treatment.

The authors created a system by which they calculate work productivity and estimate return on investment (ROI) rates by translating SR points into work productivity hours. They call this Microsoft Excel-based system of work productivity estimation the Productivity Calculator.^[11,12,13] Brown and Jones^[12] explain that work productivity is assumed to co-vary with the SR; however, they do not know to what extent the two co-vary. These researchers suggest each point on the SR represents 1-2 hours of work

productivity, although they admit the 1-2 hours is an estimate, based on assumptions from the professional literature.

The Productivity Calculator^[11,12,13] allows the user to enter several “Assumptions,” to include the following: “Covered lives,” “% accessing care,” “% of members accessing care that are employees,” “Functional Impairment Scale at Intake,” “Average Annual Employee cost (salary and benefits),” “Average Cost of Treatment,” “Average Annual Cost of outpatient MH benefit,” “% indirect impact of dependent's improvement on employees productivity,” “Productivity increase (hours per week) per point improvement on FIS,” and “Average Improvement on FIS.” “FIS” is the SR, as these authors called it the Functional Impairment Scale. For “Productivity increase (hours per week) per point improvement on FIS,” the Calculator allows the user to enter alternative estimated hours. The intake SR score can then be included as a predictor variable in a regression equation. The Productivity Calculator creators indicate future research will provide more clear assumptions about the particular number of work productivity hours each SR point represents and, thus, better estimates of the effects of treatment on work productivity.

Although this study is promising in that it shows how mental health treatment can positively impact work productivity, the study has weaknesses. The data is currently unpublished in scholarly journals. This means few scientists have had access to it, and peer review has not been accomplished. Additionally, the authors do not provide data to support their assumption that the SR does, indeed, measure work productivity (or a lack thereof). In essence, their suggestion that the Productivity Calculator actually estimates work impairment needs verification. Before the authors promote the Productivity

Calculator, a link between the SR and work productivity needs to be established. This link could increase confidence in the assumption that specific increments of improvement in mental health is likely to lead to specific increased increments of improvement in work productivity.

Validation of the SR as a Measure of Work Productivity

The current study examines relationships among the SR and WPAI in a sample of employees. This study was part of a larger study that included another sample and other work productivity measures. The information presented here provides data that can be used to help calculate the cost/benefit of psychotherapy, as was begun with the Productivity Calculator.^[11,12,13] Hopefully, this study will lead to further investigations that will allow employers, insurance companies, and government agencies and policy makers to see the degree of overall positive impact continued mental health treatment can have upon their employees and in their companies, as well as society.

METHODS

Participants

All employees from the Nursing, Occupational Therapy, Psychology, Recreational Therapy, and Social Work departments of a Western state hospital were asked to participate. Potential participants were either asked in person by the primary investigator, or via email and follow-up written invitation. Of the 130 potential participants, 62 agreed to participate one month or more. Participation in this study was voluntary, and participants received no direct compensation.

Reported ages of participants ranged from 21 to 73 (average age 46.2). Two participants opted not to provide their ages. One hundred percent of participants reported

a first language of English. About 58% of participants were female ($n = 36$), and about 40% were male ($n = 25$). One participant (1.6%) chose not to report his/her gender. About 97% of participants ($n = 60$) reported being Caucasian. Please see Table 1 for detailed information about races, and Tables 2 through 5 for a break-down of other demographic information.

Table 1: Races of Participants		
Race	Total	Percent (Rounded)
Caucasian	60	96.8
Hispanic	1	1.6
Samoan Caucasian	1	1.6

Table 2: Marital Status of Participants		
Marital Status	Total	Percent (Rounded)
Divorced	7	11.3
Engaged	1	1.6
Married	47	75.8
Single	5	8.1
Widowed	1	1.6

Note: One participant (1.6%) chose not to disclose marital status.

Table 3: Education Level of Participants		
Education Level	Total	Percent (Rounded)
High school degree	2	3.2
Some college	10	16.1
Associates Degree	1	1.6
Technical Degree	5	8.1
Bachelor's Degree	22	35.5
Graduate Degree	22	35.5

Medical Problems	Total	Percent (Rounded)
0	25	40.3
1	13	21.0
2	9	14.5
3	4	6.5
4	4	6.5
5	3	4.8
6	1	1.6

Note: Three participants (4.8%) chose not to disclose number of medical problems.

Mental Health Problems	Total	Percent (Rounded)
0	30	48.4
1	18	29.0
2	7	11.3
3	1	1.6

Note: Six participants (9.7%) chose not to disclose number of mental health problems.

Measures

The SOQ—specifically the SR scale—measured self-reported mental health symptoms, and the WPAI measured self-reported work productivity. In order to direct participants’ responses to matters involving mental health, the WPAI-GH was modified to reflect mental health functioning instead of general health functioning (please see Appendix B). This modified WPAI-GH is referred to herein as the WPAI. An additional questionnaire requested demographic information (please see Appendix C).

Procedures

Discipline Directors from five USH departments (i.e., Nursing, Occupational Therapy, Psychology, Recreational Therapy, and Social Work) introduced the primary investigator to employees. The primary investigator then recruited participants.

Discipline Directors received no direct compensation for their efforts. The primary

investigator provided those who wished to participate with a packet containing all study documents (i.e., informed consent, SOQ, WPAI, and request for demographic information).

After receiving the packet, participants were asked to read and sign informed consent (Appendix D), write their names and USH Employee Identification Numbers on it, and seal it in an envelope labeled “Consent.” Participants then completed the SOQ and WPAI, provided demographic information, sealed all documents in a provided self-addressed stamped envelope, and mailed the envelope to the primary investigator. Instead of mailing their responses, some participants opted to have the primary investigator pick-up their responses in person, in order to further facilitate confidentiality. Participants were asked to complete the questionnaires once per month, for four months; however, employee turnover hindered some participants from completing four months’ worth of data. Additionally, the Psychology and Occupational Therapy departments did not begin participation until one and two months into the study, respectively.

If any participant experienced discomfort or embarrassment while completing the documents, (s)he had the option of withdrawing from the study at anytime without jeopardizing his/her position or treatment at the USH.

Confidentiality. After volunteering, participants provided their names and employee identification numbers (EINs) on only their informed consent documents. Names and EINs were entered into a secure database on a computer on the hospital’s campus. A random, three-digit participant study number (PSN) was linked to each of the sets of names and USH employee numbers. This database was password-protected in

Microsoft Excel, within the secure system. PSNs were entered into a separate, password-protected database on the primary investigator's computer. Thus, PSNs removed from the hospital campus were not connected with names or EINs.

All documents given to participants after the first administration included a PSN so that no personal information was included. All participants were specifically asked to NOT include their names or other identifying information on any document except the informed consent. Participants then directly mailed the documents to the primary investigator in a sealed envelope, or requested that the primary investigator personally pick-up their responses. Neither supervisors nor employers could access any participant's responses. Only individuals directly associated with analyzing the data had access to responses, and only the primary investigator had access to the database containing names and EINs. All responses were kept in a locked filing cabinet in a locked room. All paper documents, the electronic database containing employee names and EINS, and the second database containing participant numbers and responses, were destroyed/deleted on 15 April 2008.

If the primary investigator had a reason to believe that such abuse, neglect, or exploitation had occurred, Utah law would have required her to report this to Child Protective Services (CPS), Adult Protective Services (APS), or the nearest law enforcement agency. No information related to such problems was found in the data collected for this study.

If an employee indicated on the SOQ that (s)he "frequently" or "almost always" experienced suicidal thoughts, the primary investigator contacted the participant directly and recommended (s)he call the hospital's Employee Assistance Program (EAP)

representative, or that (s)he contact an Emergency Room after hours. Two employees indicated suicidal thoughts and were contacted according to the protocols just described.

In order to further protect confidentiality of potentially vulnerable participants, an independent undergraduate student collected and compiled data from the Psychology discipline because the primary investigator already had a professional relationship with most of those participants.

RESULTS

The three-digit participant study number (PSN) located on each document indicated which participant had completed them across the four months. Most participants provided the date on each questionnaire, which indicated which month the documents were completed. For documents without a reported date, the month listed on other participants' questionnaires received in the mail simultaneously was assigned.

Statistical Analyses

A mixed models analysis of covariance (ANCOVA), with repeated measures, was used to analyze SR and WPAI scores. This statistic was chosen because each month contained both repeated measures and independent data sets. A mixed models analysis controls for variance from the same subject on the same measure across two or more months, and accounts for random variance from participants who completed questionnaires only one month.

Another reason mixed models ANCOVA was chosen involves statistical power. Many other statistical operations require a large number of participants for appropriate statistical power. This requirement is particularly problematic for this study, as only 62 employees participated overall, and no more than 46 individuals participated in a given

month (i.e., $n = 28$ for month 1; $n = 46$ for month 2; $n = 43$ for month 3; and $n = 43$ for month 4). Too few data points were collected per month to warrant using statistics requiring power to compare each month's data. Due to this inability to compare data by month, a variable called "Time" was added. Time is a continuous variable which increased as each month passes. If Time predicted a variable, the variable increased or decreased as time passed.

Work productivity was predicted using the mixed models ANCOVA, with repeated measures. First, demographic variables were entered for each WPAI scale to see whether any of these variables accounted for variation in scores. After adjusting for demographic information, the SR score was added to see whether it predicted any scale. Results of analyses are presented in Table 6. Three of the four WPAI scales were reliably predicted. More specifically, as the WPAI Presenteeism score increased, the SR score and the number of reported mental health problems increased significantly. As the WPAI Work Productivity Loss score increased, so did the number of mental health problems reported. As the WPAI Activity Impairment score increased, so did the SR score and the number of mental health problems reported. No variable reliably predicted the WPAI Absenteeism score.

Work Productivity Measure	Significant Predictors
WPAI Presenteeism Scale	SR ($p < 0.0001$), Mental Health Problems ($p = 0.05$)
WPAI Absenteeism Scale	No p value ≤ 0.05
WPAI Work Productivity Loss Scale	Mental Health Problems ($p = 0.01$)
WPAI Activity Impairment Scale	SR ($p < 0.0001$), Mental Health Problems ($p < 0.0001$)

The SR predicted the WPAI Presenteeism and Activity Impairment scales quite well. The Estimate values for the Solution for Fixed Effects indicates that, for every one point increase in the SR score, the WPAI Presenteeism score increases 3.4 points, and the WPAI Activity Impairment score increases 3.8 points. The number of mental health problems predicted three WPAI scores for employees. Estimate values indicate that, for every mental health problem participants reported, the Presenteeism score increased 3.9 points, the Work Productivity Loss score increased 1.6 points, and the Activity Impairment score increased 11.0 points.

Table 7: Estimates of Work Productivity Measure by Predictor and Population	
Work Productivity Measure	Solution for Fixed Effects Estimate (Predictor)
Presenteeism (WPAI Scale)	3.4 (SR)
	3.9 (MHP)
Work Productivity Loss (WPAI Scale)	1.6 (MHP)
Activity Impairment (WPAI Scale)	3.8 (SR)
	11.0 (MHP)
Notes: SR = Social Role Scale; MHP = Mental Health Problems; Age = Age of Participants.	

Time

The variable Time did not reliably predict any WPAI scale, indicating no scale score changed significantly as time passed. This suggests work productivity did not significantly increase or decrease across the four months. It also suggests that, despite the possibility of summer vacations, employees did not use a significant number of sick hours during summer months for this purpose.

DISCUSSION

The purpose of this study was to move closer to an estimation of the relationship between improved mental health and workplace functioning. The current study examined

relationships among a self-report measure of mental health (i.e., the Social role Scale [SR] of the Severe Outcome Questionnaire [SOQ]), and a self-report measure of work productivity (i.e., the Work Productivity and Activity Impairment Scale [WPAI]). It was thought that understanding the relationships among these measures might assist in estimating the cost/benefit of investing in psychotherapy, as was begun with the Productivity Calculator.^[11,12,13] Participants in this study were employees and inpatients at a Western state hospital.

Statistical analyses indicated the SR did reliably predict the WPAI Presenteeism and Activity Impairment Scale scores. This relationship between the SR and WPAI is complementary to previous research in which a variety of physical and emotional health scales explained variance in the WPAI.^[9] This relationship also establishes concurrent validity for the SR as a measure of work productivity—specifically, presenteeism. As the SR does appear to measure presenteeism adequately, the SR can now be used more confidently when calculating the cost/benefit of investment in mental health treatment using the Productivity Calculator. In other words, the link Brown and Jones^[12] assumed existed between the SR and work productivity has now been empirically established.

Productivity Calculator. The mixed models ANCOVA Solution for Fixed Effects Estimates—3.4 and 3.8 for the WPAI Presenteeism and Activity Impairment Scales, respectively—are increases in the variables for every one-point increase on the SR. These Estimates are percentages because the WPAI Scales scores are percentages. In order to input these numbers into the Productivity Calculator’s “Productivity increase (hours per week) per point improvement on FIS,” employers will need to make some decisions. First, employers should determine the number of hours per week their

employees work. Edward Jones (2005, March) indicates the Productivity Calculator provides Return on Investment (ROI) estimates at both the company level, and the individual employee level. Using an average number of hours per week for all employees would be appropriate. For the sake of illustration, 40 hours per week will be used as an example.

Second, employers should decide which of the two WPAI scales is most important to them. If employers hope to decrease presenteeism, using the SR Estimate 3.4 would be most relevant, whereas 3.8 would be most appropriate if employers hope to provide interventions for non-work-related functioning. In our example, 3.4 will be used to illustrate an employer who hopes to provide mental health treatment geared toward increasing work efficiency. Forty hours times 0.034 (3.4% as a decimal) is 1.36. This result is the number to input in the Productivity Calculator as “Productivity increase (hours per week) per point improvement on FIS.”

Table 8 provides a hypothetical Productivity Calculator Excel output of calculating the ROI of mental health treatment. The 1.36 productivity increase per SR (or FIS, as listed in the Calculator) point automatically rounded to 1.4. For this example, the company covered 5,000 covered lives, and the company-wide ROI is 220%. The ROI for each employee is 363%.

Demographic Variables. Compared to the SR, the number of mental health problems employees reported on the Demographic Information questionnaire predicted an additional WPAI Scale (i.e., Work Productivity Loss). In other words, the number of reported mental health problems reliably predicted the WPAI Presenteeism, Work Productivity Loss, and Activity Impairment Scales. This finding makes sense because a

general census of mental health problems is likely associated with a wider variety of problems than the SR, which estimates the amount of disturbance one feels in work and leisure activities. Perhaps surprisingly, the number of mental health problems did not predict Absenteeism. This may mean participants in this sample tended to work at a limited capacity in lieu of taking a leave of absence.

Table 8: Hypothetical Example of Productivity Calculator, Using 1.36 (Automatically Rounded to 1.4; highlighted) SR Score	
Assumptions	
Covered lives	5000.00
% accessing care	4.0%
% of members accessing care that are employees	65%
Functional Impairment Scale at Intake	11.0
Average Annual Employee cost (salary and benefits)	\$60,000
Average Cost of Treatment	\$550.00
Average Annual Cost of outpatient MH benefit	\$30.00
% indirect impact of dependent's improvement on employees productivity	50%
Productivity increase (hours per week) per point improvement on FIS	1.4
Calculated productivity gain	
Average Improvement on FIS	2.1
Average Annualized Productivity Gain	3.33%
Cost benefit calculations	
<i>Patient level</i>	
Value of productivity increase due to treatment (per patient)	\$1,998.97
Return on Investment (per patient)	363%
<i>Company level</i>	
Value of productivity increase due to treatment company wide	\$329,829.76
Cost of benefit	\$150,000.00
<i>Return on Investment company wide</i>	<i>220%</i>

Learning Culture Organization

Collecting data in order to improve productivity, quality, profitability, or morale is part of what Lyons and colleagues^[2] label a “learning culture organization.” They list four necessities regarding use of outcomes in a learning culture organization: 1) formal methods of identifying what data should be collected; 2) formal methods of collecting fair and accurate data; 3) formal data analysis strategies (and interpretations that can be understood from a variety of perspectives); and 4) formal methods of executing changes suggested by data interpretation.

Workplace settings could use the results of this study to promote a learning culture organization. For instance, employers could 1) decide to use the SR in order to determine their employees’ mental health status and potential for lost work productivity; 2) periodically collect SR responses from all employees in a standardized, respectful manner; 3) score and analyze SRs and identify who earned significantly high scores; and 4) provide mental health treatment to employees with significantly high scores.

Theoretically, this strategy would reduce the amount of work productivity that is lost due to mental health problems like depression. Using the Productivity Calculator to estimate ROI may bolster confidence in providing mental health treatment.

Limitations

A general limitation in this study is the small sample size, which limited the type of statistic used. Future researchers should utilize a larger pool of participants.

Researchers would also do well to increase generalizability by using employees from a variety of work settings (e.g., manufacturers vs. service providers, large corporations vs. small businesses, etc.). Despite the limitations described in this section, the SR did

reliably predict the WPAI Presenteeism and Activity Impairment Scales for employees in this study. Replication and further investigation of the SR as a measure of work productivity is recommended.

Appendix A: Severe Outcome Questionnaire (SOQ)

LIFE STATUS QUESTIONNAIRE (OQ30)

Instructions: Looking back over the last week, including today, help us understand how you have been feeling. Read each item carefully and mark the box under the category which best describes your current situation. For this questionnaire, work is defined as employment, school, housework, volunteer work, and so forth.

USH ID# _____ Date ___/___/___	Never	Rarely	Sometimes	Frequently	Almost Always
1. I have trouble falling asleep or staying asleep	0	1	2	3	4
2. I have no interest in things	0	1	2	3	4
3. I feel stressed at work, school or other daily activities	0	1	2	3	4
4. I blame myself for things	0	1	2	3	4
5. I am satisfied with my life	4	3	2	1	0
6. I feel irritated	0	1	2	3	4
7. I have thoughts of ending my life	0	1	2	3	4
8. I feel weak	0	1	2	3	4
9. I find my work/school or other daily activities satisfying	4	3	2	1	0
10. I feel fearful	0	1	2	3	4
11. I use alcohol or a drug to get going in the morning	0	1	2	3	4
12. I feel worthless	0	1	2	3	4
13. I am concerned about family troubles	0	1	2	3	4
14. I feel lonely	0	1	2	3	4
15. I have frequent arguments	0	1	2	3	4
16. I have difficulty concentrating	0	1	2	3	4
17. I feel hopeless about the future	0	1	2	3	4
18. I am a happy person	4	3	2	1	0
19. Disturbing thoughts come into my mind that I cannot get rid of	0	1	2	3	4
20. People criticize my drinking (or drug use)	0	1	2	3	4
(if not applicable, mark "never")					
21. I have an upset stomach	0	1	2	3	4
22. I am not working/studying as well as I used to	0	1	2	3	4
23. I have trouble getting along with friends & close acquaintances.....	0	1	2	3	4
24. I have trouble at work/school or other daily activities because of drinking or drug use (if not applicable, mark "never").....	0	1	2	3	4
25. I feel that something bad is going to happen	0	1	2	3	4
26. I feel nervous	0	1	2	3	4
27. I feel that I am not doing well at work/school or in other daily activities	0	1	2	3	4
28. I feel something is wrong with my mind	0	1	2	3	4
29. I feel blue	0	1	2	3	4
30. I am satisfied with my relationships with others	4	3	2	1	0

Life Status Questionnaire Cont.

	Never	Rarely	Sometimes	Frequently	Almost Always
31. I see or hear things that other people don't	0	1	2	3	4
32. I can't stop talking, moving or doing things	0	1	2	3	4
33. I have been told by others that my behavior is out of control	0	1	2	3	4
34. I must do things like wash my hands or hurt myself to feel better.....	0	1	2	3	4
35. I have difficulty with my unstable moods	0	1	2	3	4
36. My temper leads me to act without thinking, or say things that I don't mean	0	1	2	3	4
37. I am not in control of my life	0	1	2	3	4
38. I am forgetful	0	1	2	3	4
39. I have been told that I have difficulty keeping myself neat and clean	0	1	2	3	4
40. I think people are trying to make it difficult for me to succeed	0	1	2	3	4
41. I feel confused	0	1	2	3	4
42. I have difficulty completing my household chores like shopping, cooking and cleaning	0	1	2	3	4
43. I think I am really ill	0	1	2	3	4
44. I have problems making daily decisions	0	1	2	3	4
45. I have difficulty keeping jobs or managing money	0	1	2	3	4

Appendix B

Work Productivity and Activity Impairment Questionnaire: V2.0 (WPAI), Adapted from WPAI-GH

The following questions ask about the effect of your mental health problems on your ability to work and perform regular activities. By mental health problems, we mean any emotional problem or symptom (e.g., psychological distress like sadness/depression, anxiety, bipolar disorder, hallucinations/schizophrenia). Mental health problems can also be short-lived (e.g., distress resulting from marital problems or illness in your family), but they can still affect your ability to work in the past seven days. *Please fill in the blanks or circle a number, as indicated.*

1. Are you currently employed (working for pay)? _____ NO _____ YES
If NO, please do not complete this survey.

The next questions are about the **past seven days**, not including today.

2. During the past seven days, how many hours did you miss from work because of your mental health problems or psychological distress? *Include hours you missed on sick days, times you went in late, left early, etc., because of your physical or mental health problems. Do not include time you missed to participate in this study.*

_____ HOURS

3. During the past seven days, how many hours did you miss from work because of any other reason, such as vacation, holidays, time off to participate in this study?

_____ HOURS

4. During the past seven days, how many hours did you actually work?

_____ HOURS *(If "0", skip to question 6.)*

5. During the past seven days, how much did your mental health problems or psychological distress affect your productivity while you were working?

Think about days you were limited in the amount or kind of work you could do, days you accomplished less than you would like, or days you could not

do your work as carefully as usual. If mental health problems or psychological distress affected your work only a little, choose a low number. Choose a high number if mental health problems affected your work a great deal.

Consider only how much mental health problems or psychological distress affected productivity while you were working.

Health problems had no effect on my work	<hr style="width: 100%; border: 0.5px solid black;"/> 0 1 2 3 4 5 6 7 8 9 10	Health problems completely prevented me from working
--	--	--

CIRCLE A NUMBER

6. During the past seven days, how much did your mental health problems or psychological distress affect your ability to do your **regular daily activities**, other than work at a job?

By regular activities, we mean the usual activities you do, such as work around the house, shopping, childcare, exercising, studying, etc. Think about times you were limited in the amount or kind of activities you could do and times you accomplished less than you would like. If physical or mental health problems affected your activities only a little, choose a low number. Choose a high number if health problems affected your activities a great deal.

Consider only how much mental health problems or psychological distress affected your ability to do your regular daily activities, other than work at a job.

Health problems had no effect on my daily activities	<hr style="width: 100%; border: 0.5px solid black;"/> 0 1 2 3 4 5 6 7 8 9 10	Health problems completely prevented me from doing my daily activities
--	--	--

CIRCLE A NUMBER

Appendix C

Demographic Information

Instructions: For question 1, please write your age in the space provided. This study is designed to keep your answers confidential, so please do NOT include your name. Thank you!

9. Age _____

Instructions: For questions 2 – 6, please fill in the circle beside your answer. If your answer is “Other,” please write the correct information on the line.

10. What is your first (native) language?

- Chinese
- English
- Japanese
- Spanish
- Other _____

11. What is your gender

- Female
- Male

12. What is your marital status?

- Divorced
- Married
- Separated
- Single
- Other _____

13. What is the highest level of education you completed?

- Some High School. Specify which grade you completed: _____
- GED
- High School Degree
- Some College
- Technical Degree
- University (4-year) Degree
- Graduate Degree
- Other _____

14. What is your Race/Ethnicity?

- Asian
- Black/African American
- Hispanic
- Native American
- Tongan
- White/Caucasian
- Other _____

Instructions: For questions 7 and 8, please list the requested information on the lines.

15. Do you suffer from any medical/physical problems that you know of? If so,
please list them. _____

16. Do you suffer from any mental health/emotional problems that you know of? If
so, please list them. _____

Appendix D: Consent Document for Employees

Consent to be a Research Subject

Purpose

The purpose of this study is to determine how emotional/mental health affects a person's ability to work. Vinessa K. Trotter, a doctoral candidate, is conducting this research at Brigham Young University as part of her doctoral dissertation. You were chosen because "community normal" data is needed from individuals like you who are employed at a facility that already collects work productivity information.

Procedures

You will be asked to complete three questionnaires once per month, for four months. The process should take about 30 minutes each time. These questionnaires will ask you about the number of hours you worked in the past 7 days, how you have been feeling physically and emotionally, how your emotional/mental health might have affected your work, etc. One questionnaire will also ask you about demographic information. After completing the questionnaires, please return them in the provided self-addressed, stamped envelope marked "Questionnaires." Please seal your signed consent form in the envelope Marked "Consent." After I receive your packet, I will incorporate data that the USH tracks on your work performance (e.g., sick days and the presence, timeliness, and quality of routine documentation). Up to 330 individuals are expected to participate in this study.

Risks/Discomforts

Your risks for participating in this study are minimal. However, it is possible you may feel uncomfortable or embarrassed answering questions concerning your emotional/mental health. Data collected on your work productivity for this study will not be made available to USH supervisors or administrators as a part of any employee review or rating process. There is always a possibility of confidentiality breach in studies like this one; however, I am taking steps to ensure this possibility is minute. For instance, only this consent form will contain personally identifying information (i.e., your USH Employee number and your signature), and this document will be kept in a locked room in a locked cabinet away from the USH campus once I receive it. All other documents will contain your subject number—no personal information. I have included a self-addressed, stamped envelope so you can seal your responses immediately and mail them directly to me. This gives you the power to ensure no one sees your responses except you and those directly associated with analyzing the data. All your responses will be entered into a password-protected database in a secure server. This secure database will be separate from the secure database that contains your personal information. All questionnaires and databases will be destroyed once the study is complete.

Benefits

It is hoped that, through your participation, researchers will learn more about how emotional health affects work productivity.

Confidentiality

Each document in your packet has a number on it. This is your subject number. I gave you this number, which will be linked to your Utah State Hospital Identification Number, so I can look up your work history here at the USH while keeping your answers to the questionnaires confidential. No one but the researcher will know what your subject number means. All information you provide will remain confidential and will only be reported as aggregate (group) data with no identifying information about you or your specific jobs. The USH administration will not access any data for individuals or specific jobs unless legally required to do so. I ask that you do NOT include any identifying information, such as your name or social security number, except your signature and USH employee identification number on this consent form. Once you complete the questionnaires, you can seal them in the addressed, stamped envelope I provided. Again, your supervisor and employer will NOT have access to them. All questionnaires will be kept in a locked storage cabinet. All of your responses, and all other information linking you to your responses, will be destroyed by 15 April 2008. If you indicate you “frequently” or “almost always” have suicidal thoughts, I will intervene by contacting you directly.

Additionally, Utah law requires me to report any suspected or actual abuse, neglect, or exploitation of a child, an adult 65 or older, or an adult who has a mental or physical impairment, which affects that person’s ability to provide for or protect him/herself. If I have reason to believe that such abuse, neglect, or exploitation has occurred, I will report this to Child Protective Services (CPS), Adult Protective Services (APS), or the nearest law enforcement agency.

Participation

Participation in this research study is voluntary. You have the right to withdraw at anytime or refuse to participate entirely without jeopardy to your standing with, or employment at, the Utah State Hospital.

Questions about the Research

If you have questions regarding this study, you may contact Vinessa K. Trotter at BYU Comprehensive Clinic, 1190 North 900 East, Provo, UT 84602-3536; 801-422-4050; vkj2@byu.edu. If you feel uncomfortable contacting Ms. Trotter, you may contact her BYU faculty mentor, Michael Lambert, Ph.D. His contact information is 801-422-6480; michael_lambert@byu.edu. If you prefer contacting a USH internal resource, please direct questions to Dr. Frank Rees; 801-344-4203; rees@utah.gov.

Questions about your Rights as Research Participants

If you have any questions regarding your rights as a participant in this research project, you may contact Dr. Renea Beckstrand, Chair of the Institutional Review Board, 422 SWKT, Brigham Young University, Provo UT, 84606; phone 422-3873; email renea_beckstrand@byu.edu. You may also contact the DHS IRB by calling Gary Franchina at (801) 538-4109 or GFRANCHINA@utah.gov.

I have read the description of this study and I freely volunteer to participate. I understand that I can withdraw from the study at any time and that my position at the Utah State Hospital will not be negatively affected in any way by my decision to withdraw.

~ I do not grant permission for Ms. Trotter to access work productivity information that the USH already collects about me.

Signature: _____ Date: _____

USH Employee Identification Number: _____

References

1. Allen P. For the employer productivity is critical. *HealthcarePapers*. 2004; 5:95-97.
2. Lyons J, Howard K, O'Mahoney M, Lish J. *The Measurement and Management of Clinical Outcomes in Mental Health*. New York: John Wiley & Sons, Inc; 1997.
3. Goetzel R, Ozminkowski R, Sederer L, Mark T. The business case for quality mental health services: why employers should care about the mental health and well-being of their employees. *J. Occup Envir Med*. 2002; 44:320-330.
4. Langlieb A, Kahn J. How much does quality mental health care profit employers? *J. Occup Envir Med*. 2005; 47:1099-1109.
5. Reilly M. Reilly Associates Health Outcomes Research. Copyrighted 2002; retrieved 22 May 2006; <http://www.reillyassociates.net/>.
6. Prasad M, Wahlqvist P, Shikiar R, Shih Y. A review of self-report instruments measuring health-related work productivity: a patient-reported outcomes perspective. *Pharmacoeconomics*. 2004; 22:225-244.
7. Loeppke R, Hymel P, Lofland J, Pizzi L, Konicki D, Anstadt G, Baase C., Fortuna J, Scharf T. Health-related workplace productivity measurement: general and migraine-specific recommendations from the ACOEM expert panel. *J. Occup Envir Med*. 2003; 45:349-359.
8. Lofland J, Pizzi L, Frick K. (2004). A review of health-related workplace productivity loss instruments. *Pharmacoeconomics*. 2004; 22:165-184.
9. Reilly M, Zbrozek A, Dukes E. The validity and reliability of a work productivity and activity impairment instrument. *Pharmacoeconomics*. 1993; 4:353-365.

10. Burlingame G, Lee J, Nelson P, Lambert M. *Administration and Scoring Manual for the Severe Outcome Questionnaire*. Unpublished Manuscript. Salt Lake City, UT: OQmeasures; 2007.
11. Brown J. *Productivity Calculator*. Paper presented at The Newport Group, Newport, CA; March 2005.
12. Brown J, Jones E. *Productivity Calculator*. Paper presented at The Newport Group, Newport, CA; March 2005.
13. Jones E. *Evaluating the ROI for behavioral health benefits*. Paper presented at The Newport Group, Newport, CA; March 2005.

[End Appendix G of dissertation]

References

- Allen, P. (2004). For the employer productivity is critical. *HealthcarePapers*, 5, 95-97.
- Arendt, H. (1998). *The Human Condition, Second Edition*. Chicago: The University of Chicago Press.
- Beach, A. J. (1996). Empowerment to the people: Creating an atmosphere for growth. *Empowerment in Organizations*, 4, 29-33.
- Bernstein, P. (1997). *American Work Values: Their Origin and Development*. Albany: State University of New York.
- Bolek, J. E. & Somodi, M. (1998). Exploring opportunities for collaboration in an era of managed care: A biofeedback-assisted treatment plan. *Professional Psychology: Research and Practice*, 29, 71-73.
- Brown, J. (2005, March). *Productivity Calculator*. Paper presented at The Newport Group, Newport, CA.
- Brown, J. & Jones, E.R. (2005, March). *Productivity Calculator*. Paper presented at The Newport Group, Newport, CA.
- Burlingame, G., Lee, J., Nelson, P., & Lambert, M. (2007). *Administration and Scoring Manual for the Severe Outcome Questionnaire*. Unpublished Manuscript. Salt Lake City, UT: OQmeasures.
- Cockburn, I.M., Bailit, H.L., Berndt, E.R., & Finkelstein, S.N. (1999). Loss of work productivity due to illness and medical treatment. *Journal of Occupational and Environmental Medicine*, 41, 948-953.

- Conway, J.M. & Huffcutt, A.I. (1997). Psychometric properties of multisource performance ratings: A meta-analysis of subordinate, supervisor, peer, and self-ratings. *Human Performance, 10*, 331-360.
- Dugdill, L. (2000). Developing a holistic understanding of workplace health: The case of bank workers. *Ergonomics, 43*, 1738-1749.
- Fenton, E. D. (2004). Employer-provided education benefits. *Journal of Accountancy Online*. Retrieved February 10, 2008, from <http://www.aicpa.org/PUBS/jofa/sep2004/fenton.htm>.
- Goetzel, R.Z., Hawkins, K., Ozminkowski, R.J., & Wang, S. (2003). The health and productivity cost burden of the "top 10" physical and mental health conditions affecting six large U.S. employers in 1999. *Journal of Occupational and Environmental Medicine, 45*, 5-14.
- Goetzel, R.Z., Long, S.R., Ozminkowski, R.J., Hawkins, K., Wang, S., & Lynch, W. (2004). Health, absence, disability, and presenteeism cost estimates of certain physical and mental health conditions affecting U.S. employers. *Journal of Occupational and Environmental Medicine, 46*, 398-412.
- Goetzel, R.Z., Ozminkowski, R.J., Sederer, L.I., & Mark, T.L. (2002). The business case for quality mental health services: Why employers should care about the mental health and well-being of their employees. *Journal of Occupational and Environmental Medicine, 44*, 320-330.
- Guy, M. E. (1993). Workplace productivity and gender issues. *Public Administration Review, 53*, 279-282.

- Harris, M.M. & Schaubroeck, J. A meta-analysis of self-supervisor, self-peer, and peer-supervisor ratings. *Personnel Psychology*, 41, 43-62.
- Johnson, W. & Krueger, R. F. (2006). How money buys happiness: Genetic and environmental processes linking finances and life satisfaction. *Journal of Personality and Social Psychology*, 90, 680-691.
- Jones, E.R. (2005, March). *Evaluating the ROI for behavioral health benefits*. Paper presented at The Newport Group, Newport, CA.
- Kelly, J. R. & Hutson-Comeaux, S. L. (1999). Gender-emotion stereotypes are context specific. *Sex Roles*, 40, 107-120.
- Lambert, M.J., Morton, J.J., Hatfield, D., Harmon, C., Hamilton, S., Reid, R.C., Shimokawa, K., Christopherson, C., & Burlingame, G.M. (2004a). *Administration and Scoring Manual for the OQ-45.2*. American Professional Credentialing Services, LLC.
- Lambert, M.J. & Ogles, B.M. (2004b). The efficacy and effectiveness of psychotherapy. In Lambert, M.J. (Ed.), *Bergin and Garfield's Handbook of Psychotherapy and Behavior Change, Fifth Edition* (pp. 139-193). New York: John Wiley & Sons, Inc.
- Lambert, M.J., Vermeersch, D.A., Brown, G.S., & Burlingame, G.M. (2004c). *Administration and Scoring Manual for the OQ-30.2*. American Professional Credentialing Services, LLC.
- Langlieb, A.M. & Kahn, J.P. (2005). How much does quality mental health care profit employers? *Journal of Occupational and Environmental Medicine*, 47, 1099-1109.

- Lerner, D., Amick, B.C. III, Lee, J.C., Rooney, T., Rogers, W.H., Chang, H., & Berndt, E.R. (2003). Relationship of employee-reported work limitations to work productivity. *Medical Care, 41*, 649-659.
- Loeppke, R., Hymel, P. A., Lofland, J. H., Pizzi, L. T., Konicki, D. L., Anstadt, G. W., Baase, C., Fortuna, & J., Scharf, T. (2003). Health-related workplace productivity measurement: General and migraine-specific recommendations from the ACOEM expert panel. *Journal of Occupational and Environmental Medicine, 45*, 349-359.
- Lofland, J. H., Pizzi, L., & Frick, K. D. (2004). A review of health-related workplace productivity loss instruments. *Pharmacoeconomics, 22*, 165-184.
- Lyons, J. S., Howard, K. I., O'Mahoney, M. T., & Lish, J. D. (1997). *The Measurement and Management of Clinical Outcomes in Mental Health*. New York: John Wiley & Sons, Inc.
- Newman, D. L., Moffitt, T. E., & Silva, P. A. (1996). Psychiatric disorder in a birth cohort of young adults: Prevalence, comorbidity, clinical significance, and new case incidence from ages 11 to 21. *Journal of Consulting and Clinical Psychology, 64*, 552-562.
- Plato. (1992). *Republic* (G.M.A. Grube, Trans.). Indianapolis: Hackett Publishing Company, Inc.
- Prasad, M., Wahlqvist, P., Shikar, R., & Shih, Y. T. (2004). A review of self-report instruments measuring health-related work productivity: A patient-reported outcomes perspective. *Pharmacoeconomics, 22*, 225-244.

- Reid, J. B. (1982). Observer training in naturalistic research. *New directions for methodology of social and behavioral science, No 14*, 37-50.
- Reilly, M. (copyrighted 2002). Reilly Associates Health Outcomes Research. Retrieved May 22, 2006, from <http://www.reillyassociates.net/>.
- Reilly, M.C., Zbrozek, A.S., & Dukes, E.M. (1993). The validity and reliability of a work productivity and activity impairment instrument. *Pharmacoeconomics, 4*, 353-365.
- Shorter, E. (1997). *A History of Psychiatry: From the Era of the Asylum to the Age of Prozac*. New York: John Wiley & Sons, Inc.
- Smillie, J.G. (1991). *Can Physicians Manage the Quality and Costs of Health Care?: The Story of the Permanente Medical Group*. New York: McGraw-Hill.
- Smith, G. A. (1986). Observer drift: A drifting definition. *Behavior Analyst, 9*, 127-8.
- Stevens, M.J. & Campion, M.A. (1999). Staffing work teams: Development and validation of a selection test for teamwork settings. *Journal of Management, 25*, 207-228.
- Thase, M.E. & Jindal, R.D. (2004). Combining psychotherapy and psychopharmacology for treatment of mental disorders. In Lambert, M.J. (Ed.), *Bergin and Garfield's Handbook of Psychotherapy and Behavior Change, Fifth Edition* (pp. 743-766). New York: John Wiley & Sons, Inc.
- Winegar, N. & Bistline, J. L. (1994). *Marketing Mental Health Services to Managed Care*. New York: The Haworth Press.