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Rachele M. Weichmann
Rowan University

Recommended Citation

Weichmann, Rachele M., "Impact of educational attainment before diagnosis on functioning level after diagnosis" (2006). *Theses and Dissertations*. 950.
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IMPACT OF EDUCATIONAL ATTAINMENT BEFORE DIAGNOSIS

ON FUNCTIONING LEVEL AFTER DIAGNOSIS

by
Rachele M. Weichmann

A Thesis

Submitted in partial fulfillment of the requirements of the
Master of Arts Degree
of
The Graduate School
at
Rowan University
05-09-06

Approved by
Advisor

Date Approved ___ 5-9.06 ___

ABSTRACT

Rachele M. Weichmann
IMPACT OF EDUCATIONAL ATTAINMENT BEFORE DIAGNOSIS
ON FUNCTIONING LEVELS AFTER DIAGNOSIS
2005/06
Dr. John Klanderman and Dr. Roberta Dihoff
Master of Arts in School Psychology

The purposes of this study were to (a) locate any impact between the amount of education attained prior to the diagnosis of a mental illness and functionality after the diagnosis of a mental illness, (b) to see if the type of diagnosis, whether it had psychotic or non-psychotic features, had an effect on these results, and (c) to see if the relationship between these variables would plateau at the higher levels of education. The researcher examined the case histories of a group of adults with mental illness (n = 122), looking for the number of educational years each individual completed as well as the Global Assessment of Functioning (GAF) scores. The average current GAF scores were 47.5 for those with elementary school experience only, 48.5 for middle school, 51.14 for high school, and 56.17 for college. The results of the univariate analysis of variable tests indicated a significant difference in GAF scores due to grade level completion (with no foreseen plateau) despite the type of diagnosis.

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Need

Mental illness affects a large number of individuals throughout the world. It seems to debilitate some while leaving others only minimally distressed. This spectrum of symptom severity and functionality eludes all of those affected, their families, and science itself.

The researcher came into contact with a number of adults with mental illness during her time spent at Helping Hand Behavioral Health. This institution was a partial day program for those individuals who sought treatment and education on their mental illness. The program was set up in a way that separated the clients into four categories (A, B, C, D) based on their functioning levels (A was the highest functioning level and D was the lowest functioning level). This allowed them to be placed into educational groups that were appropriate for their needs. It seemed common for those who were in the higher functioning groups to have also received higher levels of education prior to their diagnosis. If there were indeed an impact found between these two variables, it could have proven to be very beneficial.

This research could be advantageous for patients, families, doctors, and mental health facilities alike. The knowledge in this area could inspire those with a family history of mental illness to complete higher levels of education. It could give hope to those newly diagnosed that their lives may not be altered as significantly as once expected. The recognition of this correlation could also give psychiatrists and mental

health facilities a better look into the prognosis of their patients.

Purpose

The purpose of this study was to find any impact of the educational levels attained before the diagnosis of a mental illness on the functionality after the diagnosis of the mental illness.

Hypothesis

The results of this study were expected to show a significant impact between the two variables. The variables being examined were the level of education completed on a year-to-year basis (kindergarten, first grade...ninth grade, etc.) and the functionality of the clients according to their scores from the Global Assessment of Functioning Scale (GAF). It was the researcher's hypothesis that the more education achieved before the diagnosis of a mental illness the higher the functionality of said person after the diagnosis of the mental illness. In other words, the functionality of the clients was dependant upon the amount of education (independent variable) that they received prior to the diagnosis.

It was believed that the positive impact would continue in a fairly predictable manner throughout most educational points (elementary, middle, high school) but would level off at the college level. For example, it was not assumed that the functionality of a doctorate level individual would be significantly higher than someone who had received only a bachelor's degree. This hypothesis stemmed from the fact that most instruction on communication, problem solving, abstract reasoning, and concept development would have occurred by this advanced educational level and would have a direct impact on

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functionality. Also, if symptoms were not observed, and therefore not a distraction from daily living, until after this level of educational attainment, then the individual would have also experienced a number of social interactions and benefited from the realization of certain societal norms which would again contribute to a higher functioning level. It must also be recognized that this awareness would, most likely, not become any more concrete, and therefore no more supportive to functionality, beyond the high school level.

Part of the hypothesis also took into account the diagnosis of the individual. The more psychotic the features of the illness the less likely there would be a significant relationship. While it was still believed that there would be a positive impact of the educational level achieved on the functionality, it was believed that the psychosis itself would conceal the functionality of the individual and the relationship would therefore not be as strong. Psychosis can make reality become blurred, and the skills of communication, problem solving, abstract reasoning, and concrete development, may be used appropriately for the world which is lived within the person's mind, but may not appear to be suitable in the actual sense of reality. However, once the patients are able to accept their diagnosis, and make the realization that what they are experiencing is false, their education should help them in coping and accommodating to their new situation, which would, in turn, increase their functionality.

The socioeconomic status (SES) of the individual prior to diagnosis would also have some effect on the relationship between the two variables, according to the hypothesis. It tended to be found that those of a higher SES were privy to better educational experiences than those of lower SES. If those in the higher SES were in fact receiving better education and therefore attaining the skills needed to function in society

at higher levels, than it would be assumed that they would have higher functioning levels after diagnosis as well.

With the SES held constant, it was not believed that age, gender, religion, or ethnicity would play a role in the impact of educational attainment before diagnosis on functionality after diagnosis. The reasoning behind this assumption lied in the belief that both genders and all religions and ethnicities could benefit from similar education equally.

History

There has been sufficient research throughout the years that prescribed to the fact that knowledge is power. Many behaviorists and cognitive theorists have shown time and time again that education, learned processes, and thinking in general were the keys to nearly everything, with mental illness as no exception. In general the behavioral model would emphasize that with reinforcement anything could be learned and behaviors exhibited through symptoms could be averted with training and education. The cognitive model saw the dysfunction of mental illness as illogical thinking patterns that could be avoided with the attainment of education into what a functional thinking pattern was. The research sought in this study was an extension of those ideas.

Formal education is continuous and very reinforcing. Each grade level brings with it graded tests, teacher responses, and the chance of a promotion onto the next level. Formal education also allows for independence and functionality to form, which is, in itself, a reinforcing factor. B.F. Skinner's article, "Science and human behavior," (1953) explained how operant conditioning leads to changes in behaviors. In this article,

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Skinner said that operant behaviors are, "the result of a continuous shaping process," and that, "If consequences are not forthcoming, extinction occurs." Basically, his premise is that everything forms from something else and that it will not continue to evolve to the desired level without consequences or reinforcement.

This research was looking to show that high levels of functionality did not form by chance. Something, the reinforcing factors of a formal education in particular, were the steps that lead to the final result. When education was over, the reinforcement, or the "consequences" ended as well, and the increase in functionality was no longer encouraged to grow.

Education is also a great base from which to expand. It teaches problem solving in every sense of the manner starting from the simple and moving to the complex. The further along in education the more an individual is taught how to take the completion of a specific, classroom only task and move it onto a more general, abstract, real life issue. Aaron T. Beck wrote of something similar that occurs in therapy in his article, "Cognitive therapy and the emotional disorders" (1976). He said in this article that under the correct conditions something labeled, "deutero-learning," occurs. This simply means that the patient is being taught how to learn on their own. He also said within this article, "The sense of mastery from solving one problem frequently inspires the patient to approach and solve other problems that he has long avoided." Education has the same positive effects.

If people were indeed gaining the skills to function at high levels during their formal education, one would hope that this knowledge would stay with them after the diagnosis of a mental illness. However, if the patients were not given the chance to attain

this information prior to the diagnosis, it would be difficult to assume that they would be able to function at equal levels as those who have already gained confidence in themselves.

Beck (1976) described his cognitive therapy through the article as, "an extension and a refinement of what people have done to varying degrees since the early stages of their intellectual development." This means that during the therapy, the therapist will acknowledge what is already known and reintroduce it during unfamiliar or uncomfortable situations. He also said that, "...prior to the onset of the illness, the neurotic frequently shows adequate development of his conceptual tools for dealing with the problems of the living" (Beck, 1976). This shows that those patients were able to have logical cognitions prior to diagnosis and therefore can be reminded of how to do so again after diagnosis.

These statements are made under the assumption that the patients were quite knowledgeable, capable, and of high functioning levels prior to the diagnosis. There are sufficient numbers of individuals who, in reality, have not yet reached this advanced level of achievement before they were burdened with the symptoms of their mental illness. In these situations there is nothing to reintroduce or to redistribute to an unfamiliar area of life. They are expected to learn something new under increasingly more difficult circumstances. Their symptoms make the acquisition of new knowledge even more difficult than it was before the diagnosis. For this reason, those who were not given the opportunity to learn prior to diagnosis cannot be expected to achieve post diagnosis at the same high levels as those who were given this advantage.

This research was attempting to demonstrate that there was an impact of

educational levels attained before diagnosis on the functionality levels after diagnosis. The results followed in this manner if education did indeed introduce the skills necessary to form functionality. Following the thoughts of Aaron Beck, the ideas learned previously would able to be reintroduced after diagnosis. If the education was never fully grasped, than there would be nothing to reintroduce and the person would be at the strict disadvantage of having to learn the skills anew. With that being said, it would be easy to see that those with higher levels of attained education prior to diagnosis would also have higher levels of functionality after diagnosis.

Definitions

Educational attainment and functionality were the two main principles behind the hypothesis of this study. While these themes seem, at face value, to be simple in nature, they can in fact be quite complex. Some explanation as to how these phrases were defined within this study may be necessary to fully comprehend the meaning behind the research.

Educational attainment was defined simply as the grade level completed during formal education. It was a way to numerically measure how far an individual as gotten in their educational experience. Under this definition, a person who has completed the eighth grade would be considered to have attained a higher level of education than a person who has only completed the fifth grade. The same logic follows to say that a person who has completed the ninth grade would have attained less education than a person who has graduated high school. If a person dropped out, mid grade level, and had never fully completed the education necessary to pass that grade level, than this person

would be recorded as finishing only the grade beneath that which he or she is in presently. Therefore, an individual who has completed the tenth grade would be considered to have the same amount of education as an individual who dropped out of eleventh grade without yet receiving a passing score for that grade level.

It is well understood that a lot of informal education occurs throughout one's life through personal experiences, but this was not officially assessed during this study. The completed grade levels were a way to accurately measure the amount of education received. It was much more difficult to put a numerical value on or to precisely calculate what education was achieved through other sources. Also, since the government has some say in what was taught in each grade level, some confidence could come in the assumption that two individuals who completed the same grade levels would have similar knowledge bases. It would be difficult to make this same assumption based on informal education, since each person's experiences were so dissimilar.

Functionality, in this study, was based solely on the Global Assessment of Functioning Scale (GAF) scores. This scale sought to find psychological, social, and occupational functioning levels of individuals. This particular functioning scale was not designed to include any form of impairment that would be seen due to physical or environmental limitations. For this reason, the GAF seemed to assess the ideas of functionality as implied in the hypothesis.

The scale sought to find or rule out impairment in the areas of hygiene, suicidality, homicidality, the want to harm oneself or others, communication, judgment, reality testing, occupational/educational performance, coping skills, and life satisfaction. The scale had a rating system from zero to one hundred, which rated those of a higher

functioning level with a higher number. It took into account both symptom severity and functioning and should have always reflected the worse of the two if the numbers seemed discordant according to the assessment scale.

This study looked at the GAF scores upon their first admission at HHBH and their current GAF scores. The first of the GAF scores mentioned were the scores given immediately after or closely following their diagnosis. The current GAF scores were the scores given after they have had time to live with their diagnosis, giving them an opportunity to reintroduce the knowledge that they gained prior to diagnosis.

Assumptions

This study, as with all other studies, was based on the foundation of a few basic assumptions. The first of those assumptions in this particular study was that the facts found within the historical charts of the clients were accurate. For example, if the chart mentioned that an individual had completed high school, it will be assumed that the person who recorded this information had accurate knowledge as to the client's educational attainment before recording this as fact.

A second assumption that was important in this study was that individuals who completed a certain level of education did so based on their own merit and not due to any other variable. If students were "pushed through" to the next grade without truly acquiring the skills necessary to do so, they would be falsely considered as attaining more education than they genuinely had. Under this same concept, it is assumed that each grade level, despite school, location, or type of classes (i.e. special education) was taught at approximately the same educational level. A student graduating the second grade, no

matter in what school district, should be leaving that grade with the same knowledge base as a student who completed this grade level in any other school.

Limitations

It is acknowledged that there were a few limitations to this particular study. In this research, the cliental was that of one partial day program in southern New Jersey. The majority of the clients in this facility was from the New Jersey area and had attended schools and mental hospitals from this section of the country. This specific geographical location had some bearing on the demographics of those in the study since the ethnicity (vast majority were Caucasian) and religion (mainly Christian) were fairly uniform. Since this cliental was so specific, it was difficult to assume that the results of this study would easily generalize to the population of all adults with mental illness throughout the world.

It should also be mentioned that the facility wherein the cliental was being researched was an educationally based facility. They were receiving ongoing education to assist them in their functioning level, with daily groups discussing life skills (such as hygiene), problem solving, reality orientation, and social skills. This facility also had a psychiatrist that met with each client on a monthly basis and prescribed, as necessary, a number of psychotropic medications. Not all individuals with mental illness are fortunate enough to receive this kind of assistance. Therefore, the results of this study would not be applicable to a population of adults with mental illness who are not receiving these kinds of services.

Summary

There are a number of things to come as this thesis continues. The second chapter will begin to delve further into the findings of other researchers. It will examine which results were influential in the development of this study. The genius of others can help to make new studies, including this one, more powerful and beneficial.

The third chapter will begin to discuss the design of the study. It will communicate in more specific detail the cliental, the scale itself, and the chart histories. This chapter is designed to serve as a template of how the data will be collected and how it will be useful to those in the future who may wish to replicate pieces of the study.

Chapter four will tell the results of the data collection. It will give all of the facts that were found throughout the research in an organized and precise manner.

The final chapter of this thesis will serve as a summary of all of the conclusions found after the completion of the study. This will examine the findings and will compare them to the original hypothesis. It will also lie out any ideas for future research.

Chapter 2: Past Research

Introduction to past research

As stated previously, the hypothesis presumed that there was a significant impact

of educational attainment before the diagnosis of a mental illness on functionality (as

measured by GAF scores) after diagnosis. It was clear that the two variables in this study

were educational attainment and functionality. When looking into past research on the

connection between these two variables, only a minimal number of experiments were

found. Those experiments that were located discussed the correlation between

educational attainment and functionality in both "normal" and mentally ill populations.

While research in this very specific area was minimal, there was much more in relation to

related topics. These areas will be examined and summarized throughout this section.

Some examples of what to come are described below.

In looking at educational attainment alone, many areas related to this thesis were

found. Educational attainment has been linked to certain mental illnesses or symptoms

specifically and has been shown to be affected by the mental illness itself. Educational

attainment has also had strong associations with socioeconomic status (SES) and mental

illness has been shown in disproportionately high numbers in those with low SES.

Educational attainment has also been shown to be related to hospitalizations for mental

illness and co morbidity of mental illnesses.

In looking at functionality alone, there has also been a sufficient amount of

research as well. Functionality as indicated through employment has been shown to be

affected directly by educational attainment and has indications of being affected by mental illness in general.

The scale that the researcher for this specific research used to measure functionality (GAF) was also explored in past research. It was necessary to see what determines the GAF scores and to note its link to violence in mental illness. All of these concepts will be thoroughly examined throughout this section, starting with what is most related to the researcher's theme and moving on to the more general topics.

Functionality and educational attainment

Functionality is an indicator of the execution of a number of life's responsibilities. It can remain stable or fluctuate in both mentally ill and normal populations. In regards to its exact definition, functionality remains fairly variable throughout past research. Some have shown it in psychosocial aspects, through daily living, through job maintenance, or as shown in the next article through cognitive functioning.

The journal article entitled, "Education and Change in Cognitive Function. The Epidemiologic Catchment Area Study," showed that as educational attainment increased the decline in cognitive functioning decreased (Farmer, Kittner, Rae, Bartko, and Regier, 1995). This experiment was done using a stratified sample of 14,883 adults (18 years of age and older) from mental hospitals, long-term care facilities, prisons, and residential areas, indicating that the sample was not representative of a strictly mentally ill population. These individuals were interviewed on two different occasions (12 months apart) between the years of 1980 and 1984 regarding educational attainment and cognitive functioning. Educational attainment was decided by self-report to the question,

"What's the highest grade in school or year in college you completed?" The answers were placed into three strata: 0-9 years of education, 10-12 years of education, and some college plus. Cognitive functioning was assessed through the Mini-Mental State Examination (MMSE) which measures orientation to time, orientation to place, registration of three words, attention and calculation, recall of three words, language, and visual construction (Farmer et.al., 1995).

The way that these variables were measured in this study was similar to the way the variables were defined in the present study. Educational attainment was due mainly to self-report in the case histories, and GAF scores assessed similar areas of functioning as the MMSE in regards to orientation and language. It should be noted that Farmer et.al.'s study did have a much stronger focus on cognitive abilities than the present study however.

Farmer et.al. adjusted for confounding variables while using a logistic regression to estimate the odds ratios of the effect of education on the decline of MMSE. A decline was defined as a drop in three or more points on the MMSE scale. Their findings indicated that college experience greatly affected the scores at baseline of the MMSE, with those individuals scoring higher than those with fewer years of education. They also found that between interviews, the percentage of individuals that showed a decline in MMSE scores significantly decreased with increasing educational experience in each strata, unless they were 65 years of age (or older) with a very low baseline on the MMSE (between 0 and 23) indicating a possible floor effect. The years of education were a predictor of cognitive decline in all ages. Therefore, it was noted that education was a significant predictor of cognitive decline in those with better initial cognitive

performances. The article was sure to reiterate the fact that this was shown true not only in the population that is at risk for dementing disorders but also in younger subjects (Farmer et.al., 1995).

The researchers from the article, "Education and Change in Cognitive Function," believed that their research may have resulted in such a manner due to the fact that educational attainment may be a risk factor of dementia or due to education itself providing a "reserve of brain capacity that much be depleted," before dementia can be fully manifested. They were sure to include a statement indicating that their research was not one of causation and mentioned that it may be possible that association between the two variable was due to a third, unknown and unmeasured factor that is in some way was related to both variables independently (Farmer et.al., 1995).

In the end, the association between educational attainment and functionality was clear for this sample. As indicated previously the participants in the Farmer et.al. research were not necessarily mentally ill. It was important to see that educational attainment was linked to functionality in the regular population before one tried to assume that it would be so in the mentally ill population. If it were not revealed that most people had an association between their educational level and present functionality, it would be unlikely that a marginal subset, such as the mentally ill, would have such a relationship. Still, now that it has been found likely in the normal population it is possible to move to the more specific, mentally ill division.

In the article, "Predictors of response in a sample of treatment- resistant psychotic patients on clozapine," the researchers were examining the variables (functionality and educational attainment) in a sample of those with psychosis. Throughout this study

functionality was measured using GAF and educational attainment was determined based on four different categories (primary school, secondary school, high school, and university). This study used the sample of 101 neuroleptic-refractory patients from the follow-up program at the day-hospital service and wards of the Department of Psychiatry University of Pisa, Italy. Each of the individuals in the study had a diagnosis (according to the DSM-III-R) of schizophrenia (N = 34), schizoaffective disorder (N = 30), or bipolar disorder with psychotic features (N = 37). The goal of the research was to identify any predictors of clinical response to clozapine and its functional outcome. "Clinical response," was defined as the reduction of 50% of the total score of the Brief Psychiatric Rating Scale (BPRS) and "functioning outcome," was defined as a GAF score of at least 50. (Ciapparelli, Ducci, Carmassi, Carlini, Paggini, Catena, Bottai, and Dell'Osso, 2004).

This article was relevant to the present research in part due to the population being studied. Most of the clients who attend HHBH are from one of those above mentioned diagnosis groups. Also, as stated previously, functionality was measured in the same way through GAF scores. Since functionality is such a diversely defined construct, the fact that it is being measured in the same fashion was essential to the relateability of one study another. This present study examined educational attainment in a fairly similar manner as well.

Ciapparelli et.al., assessed the psychopathology on numerous occasions using the BPRS (baseline, and after 1, 3, 6, 12, 18, 24, 36, and 48 months). The GAF was assessed almost as often (baseline, and after 12, 24, 36, and 48 months). Over time it was found that 11 factors were significant predictors (p-value < 0.05) of the "clinical response," and

the "functioning outcome," of the treatment of clozapine in psychotic patients. These predictors were education, gender, diagnosis, age of onset, GAF score, BPRS total scores, and BPRS's 5 factors' scores (Ciaparelli et.al., 2004).

The article's results indicated that the more severe the global psychopathology was at baseline the more positively associated it was with a clinical response and the less associated it was with a functional outcome. It also showed that individuals with bipolar were more like to respond to treatment (p-value < 0.05), females were more likely to achieve functional outcome ($p < 0.01$), and those patients with an early onset age of the diagnosis were more likely to achieve functional outcome than those with late onset ($p < 0.05$). It also showed that those who had graduated from high school had a higher functional outcome than those who only had a primary education ($p < 0.05$). It is important to understand that a significant difference was only found in those with a university education (Ciaparelli et.al., 2004).

While was only the last piece of evidence that was relational to the present research, it was still very important. This article was another indicator that undisputedly shows that there was a definite correlation between educational attainment and functionality. An additional article to emphasize this same relationship is, "Demographic, Clinical, and Neurocognitive Correlates of Everyday Functional Impairment in Severe Mental Illness."

In this article the medical records of 105 adult psychiatric patients from the John's Hopkins Hospital were examined in efforts to demonstrate the relevance of cognitive performance to everyday functioning in the severely mentally ill. Those mental illnesses examined in this study were schizophrenia or schizoaffective disorder (n = 35), major

depression (n = 29), bipolar disorder (n = 26), and other mental disorders (n = 26). Their cognitive abilities were evaluated through the Wechsler Adult Intelligence Scale-Revised (WAIS-R) the Hopkins Verbal Learning Test (HBLT), the Brief Test of Attention (BTA), and the Controlled Oral Word Associations Test (COWAT). In the end cognitive ability was determined by the verbal and performance scores of the WAIS-R, the sum of words recalled after 3 presentations from the HBLT, the number of letter and number strings correctly monitored form the BTA, and the number of words giving in response to the letters "F", "A," and "S" in one minute from the COWAT. Functional impairment was assessed through the Milwaukee Evaluation of Daily Living Skills (MEDLS) and an occupational therapists rating (on a 0-4 point scale) of independence of eating, personal health care, safety at home and in the community, time awareness, medication management, and the use of telephone, money, and public transportation (Schretlen, Jayaram, Maki, Park, and Abebe, 2000).

While functionality in this particular article was not defined exactly as was in the thesis, it was important to realize that a lot of the same components were being examined. It was also essential to point out that the sample was again representative of the sample that was used in the present study.

The results of this article indicated that only two demographic variables (age and education) were linked clinical diagnosis, cognitive test performance, and everyday functioning at a significant level ($p < 0.05$). It showed that advanced age ($r = -.32$, $p < 0.01$) and fewer years of education ($r = .29$, $p < 0.01$) were associated with greater functional impairment. Education correlated with MEDLS ratings only in those without schizophrenia, however ($r = .29$, $p < 0.02$). This may be due to the fact that patients with

schizophrenia (M = 35.3, SD = 5.3) showed greater functional impairment on the MEDLS (t (103) = 4.8, p , 0.001) than those who did not have this diagnosis (M = 39.5, SD = 3.8). According to the data age and education accounted for nearly 17% of the variance in MEDLS ratings and diagnosis accounted for another 10% (Schretlen et.al., 2000).

This showed a correlation between cognitive test performance and everyday functional impairment in individuals with schizophrenia. It also found that age, education, and psychotic symptoms were a direct influence on this functioning (Schretlen et.al., 2000). In relation to this specific research, another example of educational attainment as a correlate to functionality was found.

One study that looked at schizophrenic patients in particular was the article entitled, "The Relationship of Neuropsychological Abilities to Specific Domains of Functional Capacity in Older Schizophrenic Patients." The purpose of the study was to determine if specific cognitive measurements were predictive of everyday functioning. They study looked at 166 different individuals. Some of the individuals from the study (n = 93) had a diagnosis of schizophrenia or schizoaffective disorders (verified by use of the DSM-III-R or the DSM-IV) and were already participants in a study conducted by the University of California, San Diego, Interventions Research Center on late-life psychosis. The other participants (n = 73) did not have a mental illness diagnosis and were recruited from volunteers at the VA Medical Center who had responded to advertisements for the research. Clinical symptoms were assessed by trained research assistants using the Scales for the Assessment of Negative and Positive Symptoms (SANS and SAPS respectively), the Hamilton Depression Rating Scale (HAM-D), and the Abnormal

Involuntary Movement Scale (AIMS). The mean global scores were calculated from the Halstead-Reitan Neuropsychological Test Battery, WAIS-R, the Wisconsin Card Sorting Test, the California Verbal Learning Test (CVLT), the Digit Vigilance Test, the Boston Naming Test, the Grooved Pegboard Test, the Story Memory Test, and the Figure Memory test, as an indicator of neuropsychological ability. Functioning was measured using the DAFS scale, which looks mainly at adult daily living skills (Evans, Heaton, Paulsen, Palmer, Patterson, and Jeste, 2003).

In the statistical analysis of this study log transformations were performed on the DAFS scores and the total neuroleptic dose and the MannWhitney U tests and Spearman rank order correlations were used. Also independent groups t tests were used to compare the two groups. Alpha level 0.01 was used to define significance throughout this article. The results indicated that those with schizophrenia had mild to moderate psychopathology only but were still significantly impaired (lower cognitive domain scores and DAFS subscale scores) when compared to the normal group. In looking at the demographic measures only level of education significantly affected performance on some DAFS measures (communication, finances, and overall functional capacity). Negative symptoms were also associated with impairments on the DAFS measures (communication, finances, shopping, and total DAFS). This study showed empirically that cognitive functioning was a strong predictor of performance on the DAFS indicating that cognitive abilities are predictive of functioning. The most important aspect of this study, in relation to the present thesis, however was that education was a significant correlate of functional capacity in those individuals with schizophrenia (Evans et.al., 2000).

The last article that was in direct relation to the variables at hand (educational attainment and functionality) was an article entitled, "Psychosocial functioning on the Independent Living Survey in older outpatients with schizophrenia." This study looked at 57 outpatient individuals with a DSM-IV diagnosis of schizophrenia who were recruited from the University of California, San Diego Geriatric Psychiatry Clinical Research Center (GPCRC) which gets their participants from a number of areas (Veterans Affairs San Diego Healthcare System, University of California, San Diego Psychiatry Outpatient Services, San Diego County Mental Health Services, and private physicians). It also examined 40 non-psychiatric control patients with not past mood, anxiety, or psychiatric disorders who responded to advertisements from the Veterans Affairs San Diego Healthcare System and general community. Functionality was rated using the Independent Living Skills Survey (ILSS) which assess 10 areas (personal hygiene, appearance and care of clothing, care of personal possessions, food preparation/storage, health maintenance, money management, transportation, leisure and community, job seeking, and job maintenance) and was averaged using a Global Functioning Score. Symptom severity (assessing the experimental group only) was rated using the Positive and Negative Syndrome Scale (PANSS). The Mann-Whitney U-test was used to compare the PANSS to the ILSS. Only alpha levels of < 0.01 were considered significant in this study (Perivoliotis, Granholm, and Patterson, 2004).

The results of the study indicated that those with schizophrenia had significantly lower scores on the ILSS Global Functioning Score ($U = 143.5$, p , 0.001, $d = 2.22$) in comparison to the controls in 8 of the 10 functioning areas. There was not a significant difference in regard to the care of personal possessions ($u = 819.0$, $p > 0.05$, $d = 0.23$) or

job maintenance ($U = 761.0$, $p > 0.05$, $d = 0.05$). Food preparation/storage abilities were significantly negatively correlated with positive symptoms. Educational attainment (lower education) was related to job seeking ($t = 1.92$, $p = 0.06$) and job maintenance ratings ($t = 5.18$, p, 0.001). Therefore, lower education predicted worse job seeking functioning in the sample as a whole and, surprisingly enough, higher education was associated with worse job maintenance scores in patients but better job maintenance scores in controls (Perivoliotis et.al. 2004).

While the main idea of this article was to show that schizophrenia is related to significant impaired functioning, this is not the most vital aspect of the study in regards to the present thesis. The key of this experiment, in relation to the present study, was to show that educational attainment was linked to scores of functionality in those with a mental illness. It was shown that there was indeed a relationship between these variables in regards to both the normal and the psychiatric populations.

This section is now going to take a step in the more general direction. The studies following are not directly related to this research hypothesis by did have an impact regarding a piece of the present research.

Educational attainment and specific mental illness or symptoms

Educational attainment alone has been shown to be both a cause and a consequence of mental illness. In fact, that is exactly what Miech, Moffitt, Wright, and Silva were trying to prove in their article, "Low Socioeconomic Status and Mental Disorders: A Longitudinal Study of Selection and Causation during Young Adulthood," (1999). What is important to recognize in this article was the determination of SES. This

article states specifically, "Educational attainment is both itself a primary component of SES indices and also a major predictor of subsequent income and occupational prestige over the life course," (Miech et.al., 1999). This indicates that SES was sole determinant of educational attainment in this study.

The data included information from 939 individuals (52% males and 48% females) that were already taking part in the Dunedin Multidisciplinary Health and Development Study. For the purposes of the study at hand they only looked at the data acquired from ages 15 to 21 years old including their diagnosis (assessed through the DSM-III and the DSM-III-R), educational attainment, and psychological, medical, and sociological measures (mental health interview, Life History Calendar, and physical exams). A breakdown of the mental illness found throughout the study goes as follows: (n = 100) age 15 anxiety disorder, (n = 185) age 21 anxiety disorder, (n = 37 at age 15, n = 163 at age 21) depression disorder, (n = 81 at age 15, n = 50 at age 21) oppositional disorder/antisocial disorder, and (n = 20) attention deficit disorder (ADD) which was not indicated at the age of twenty one (Miech et.al., 1999).

It is important to recognize that since this was a longitudinal study the age onset of diagnosis or the lack of a diagnosis before the age of 21 was part of the research. This was something that was essential in deciding the causality of educational attainment and mental illness.

The results indicated that the relationship between mental disorders and SES (educational attainment) was dependant upon the diagnosis. It was found that anxiety impaired educational attainment but did not hinder progress through educational transitions indicating a causation process of anxiety. SES predicted anxiety at age 15 and

that SES of destination by age 21. There was neither causation nor a selection process in depression that indicates that SES and depression do not influence each other. Antisocial disorders had both selection and causation effects indicating that conduct disorder at 15 puts students at risk of failing at every educational transition and that lower SES predicted conduct disorders at age 15. Attention deficit had a selection process meaning that those with ADD were more likely to fail in school at all transitions (Miech et.al., 1999).

This study was important to the present research because it showed a relationship between educational attainment and mental illness. In the present study one was trying to examine educational attainment prior to diagnosis of a mental illness. For this reason, it was central to understand if educational attainment had any bearing on the mental illness itself. The above study showed that it does in fact have a causal effect on some forms of mental illness.

It must be stated that since educational attainment has been shown as a causational link for some mental illnesses it is not surprising that it was shown in correlational studies relating the two variables together. There were two different articles that showed a negative correlation between educational attainment and mental illness. In one article, "Marital Role, Education, and Mental Disorder Among Women: A Test of Interaction Hypothesis," it was shown that the higher the educational attainment, the lower the incidence of mental disorder symptoms in woman ($p < 0.01$). It was also shown that the lower the educational attainment, the higher the incidence of mental illness symptoms especially in married woman with less than high school degrees (Meile, Johnson, and Peter, 2005). In the article, "The prevalence of major depression in

dysthymia among aged Medicare Fee-for Service beneficiaries," this same negative correlation was shown. In this study, it was revealed that greater years of education reduced the likelihood of major depression or dysthymia (McCall, Parks, Smith, Pope, and Griggs, 2002).

Educational attainment not only related to specific mental illnesses but also to certain symptoms of mental illness such as suicidality. In the article, "Gender Differences in Risk Factors for Attempted Suicide among Youth Adults: Findings from the Third National Health and Nutrition Examination Survey," it was found that attempted suicide (in woman only) was correlated to low educational attainment. Most of the woman in this category had the diagnosis of major depressive disorder (Zhang, McKeown, Hussey, Thompson, and Woods, 2005).

Of course not all research is consistent in the area of educational attainment and mental illness. In fact the article, "Does education moderate neuropsychological impairment in late-life depression?" was an example of this. The purpose of the article was to see if there was an influence of educational level on the degree of neuropsychological impairments associated with late life depression. The results indicated a non-significant differences in the Hamilton Rating Scale for Depression scores between the high education group with $p = .31$ and the low education group with $p = .92$ (Bhalla, Butters, Zmuda, Seligman, Mulsant, Pollock, and Reynolds, 2005).

Educational attainment through academic achievement and mental illness

In the present study the educational attainment before diagnosis was being measured. The measurement of this variable was simply that, how far did the person go

through school before stopping. There was no indication as to why the person stopped attending school. It was possible that the student ceased classes due to personal reasons (family obligation, financial reasons, etc), because the symptoms of the mental illness (present but not yet diagnosed) were affecting motivation, because symptoms of the mental illness were frustrating and distracting causing drop out, or in many cases, often seen in those without psychiatric issues, school was not for them anymore. Any one of these reasons, and many others undoubtedly forgotten, could have caused a person to stop attending classes and would have attributed to the first part of the variables measured in the present study. This section is going to show past research that has found mental illness playing a role in academic achievement.

The first entry is a section from a booklet found in the Psychosocial Rehabilitation Journal entitled, "Frequently Asked Questions by Educations about Students with Psychiatric Disabilities." In answering the question, "How does mental illness interfere with functioning at school," it describes some activities that those with psychiatric disabilities may have difficulty doing. These examples included screening out environmental stimuli, sustaining concentration, maintaining stamina, handling timing pressures and multiple tasks, interacting with others, responding to negative feedback, and responding to change (Soydan, 1990).

While it is not indicated in this entry it is notable that the "sustaining concentration," and "interacting with others," examples are also indicated in the GAF assessment for functionality. This article is therefore pertinent to the present study for two reasons. First it showed an example of how mental illness could lead to lower academic achievement, which could lead to drop out rates. Secondly, it laid the

groundwork for how problems with education could lead to problems with functionality.

The article, "Developmental Abnormalities of the Hippocampus in First-Episode Schizophrenia," is another example of how mental illness is related to poor academic achievement. The article starts with the foundation of knowledge indicating that hippocampal fissures (HF) are significantly associated with poor educational achievement and with anxiety-depression symptoms during onset of schizophrenia. With this knowledge base, the researchers wanted to know if HF were a good determinate of schizophrenic patients. The results indicated that patients with schizophrenia had significantly larger mean HF volume and a no significantly smaller hippocampal volume in comparison to the control group. It also showed a significant partial correlation between increased HF size and poor education achievement (partial $r = -0.41$, $n = 33$, $p < 0.05$). The results indicted that HF was an indicator of schizophrenia and that it did predict poor educational achievement (Smith, Lang, Kopala, Lapointe, Falkai, and Honer, 2003).

Emotional and behavioral disorders in particular are greatly correlated with a decrease in academic ability. The article entitled, "Career-Related Outcomes of a Model Transition Demonstration for Young Adults with Emotional Disturbance," described a statistic wherein as many as 64% of those with emotional behavioral disturbance (EBD) never complete high school and upon graduation are much less likely to pursue further education (Hagner, Cheney, and Malloy, 1999). "Research on the Academic Status of Children with Emotional and Behavioral Disorders-A review of literature from 1961-2000," showed similar findings. This study reported that in none of 16 articles reviewed, was EBD reported as performing at grade level and that in fact 91% of those with EBD

were considered "academically deficient," (Trout, Nordness, Pierce, and Epstein, 2003). In fact, these individuals were often similar in performance to those with learning disabilities in arithmetic and written expression (Trout et.al., 2003).

In each of the above articles, the relationship of academic achievement was discussed after the individual had a known diagnosis. This negative impact on academic achievement also arises prior to diagnosis. It was shown in, "School performance in secondary education shows no decline before the onset of a first episode of psychosis in schizophrenia," that even before the diagnosis of schizophrenia there is a level of poor academic achievement. It was sure to distinguish and all around poor academic ability to a sudden decrease (which was not found) in academic achievement (Gaag, Wolthaus, Haan, and Wykes, 2003). In the case of bipolar, there were similar findings. "Academic and Cognitive Abilities in Children of Parents with Bipolar Disorder: A Test of the Nonverbal Learning Disability Model," was an article that looked at children with a genetic risk of getting bipolar (parents with the diagnosis) but who had not yet been diagnosed. The results indicated that 39% of the at risk children had a significant verbal > performance score split on the WISC-III (p = 0.02) and that they were much more like to display this result compared to the control group (McDonough-Ryan, DelBello, Shear, Ris, Soutullo, and Strakowski, 2002).

MI disproportionately found in low SES

As displayed previously SES is often defined through educational attainment. Those with low educational levels are more likely than not a part of the lower SES. Interestingly enough, it has been found that those with mental illnesses are found in

disproportionately high numbers in low SES. In relation to the present thesis, it was important to understand that any relationship between mental illness and educational attainment was going to have affected the present research.

The finding that there was a correlation between lower-SES and mental illness was found in three different articles. The first of these articles was, "Socioeconomic Status and Psychiatric Disorder among Blacks and Whites." This article was quoted as saying, "Our findings are generally consistent with the view that education may be the most stable and best single SES predictor of health status," (Williams, Takeuchi, and Adair, 1992). This statement reiterates the fact that SES is described through educational attainment. The findings of this study also indicated that white males at the second lowest-SES had higher rates of psychiatric disorders than black men and that lower-SES black females had higher rates of substance abuse disorders than white women (Willams et.al., 1992). The article, "The Epidemiological Study of Schizophrenia: A Current Appraisal," showed similar results in a number of articles with which it was reviewing. It was quoted as saying, "The best known and most provocative of these findings is that, within urban society, schizophrenia occurs most often at the lowest social class level," (Turner, 1972).

The last article in this section not only found information indicating that mental illness was most often found in lower SES but also went a step further in displaying the possibility that it was due to downward mobility after diagnosis. This article was entitled, "Occupational Mobility and Schizophrenia: An Assessment of the Social Causation and Social Selection Hypothesis." The quote from this article is, "Analysis of patients' occupations supported the typical finding of a substantially disproportionate

number of schizophrenics in the lowest occupational category," (Turner and Wagenfeld, 1965).

Educational attainment and hospitalizations/co morbidity

There are a lot of things that can be placed under the heading functionality. It is possible to assume, as in this thesis that higher educational levels increase functionality. It is also plausible to assume that one with high functionality would have few hospitalizations and would be less likely to have co morbidity of diagnoses. Assumptions are however, only guesses and it is up to empirical evidence to show if these guesses are true.

The article, "Residence, Social Class, and Schizophrenia," showed a very strong relationship between educational attainment and the rates of first admission into a psychiatric hospital for those with schizophrenia. The results indicated that the higher the educational status, the lower the rate of first admission. In fact, in all three examined areas (city, urban, and rural) those with a grade-school education were about 10 times more likely to be admitted than those with a college education (Eaton Jr., 1974). In "Variables that Differentiate Between Single and Multiple Admission Psychiatric Patients at a State Hospital Over a 5 Year Period," the idea of a link between educational attainment and multiple admissions was debated. It was found that age, educational level, and the Shipley-Harford Scale had no ability to discriminate between first and multiple admits to the hospital (Jansen and Nickles, 1973). In, "Psychiatric co morbidity in first episode psychosis: the Early Psychosis Intervention Program (EPIP) experience," the idea of educational attainment and GAF scores as indicators of co morbidity as

compared to single disorders. The findings were the opposite of that expected. Findings

indicate that there were no significant differences between those with and without co

morbidity in length of education, or GAF scores (Sim, Swapna, Mythily, Mahendran,

Kua, McGorry, and Chong, 2004).

Educational attainment and functionality through employment

One of the greatest concerns of functionality, especially in the American

community is employment. In order to seek out a job, maintain the job, and feel fulfilled

while at work, a person must have a lot of skills of functionality. There has been a

sufficient amount of evidence to indicate that educational attainment in linked to

employment. This section will look at two ways in which this relationship in relevant.

The first article entitled, "Early-Onset Psychiatric Disorders and Male

Socioeconomic Status" attempted to show that early-onset psychosis (before the age of

16) would impair an individual's ability to proceed with schooling (Jayakody, Danzier,

and Kessler, 1998). The reasoning behind this theory is that the diagnosis itself disrupted

the educational advancement. The diagnosis would bring with it a lot of frustration and

symptom logy that would make educational settings very difficult. One of the quotes

from the article states, "Psychiatric disorders that *first* occur at age 40, for example can

not have affected high school graduation, whereas those that occurred at an early age can

have done so," (Jayakody et.al., 1998). The results indicate that early-onset psychiatric

disorders do in fact predict educational attainment (Jayakody et.al., 1998). The second

article, "Correlates of vocational recovery for persons with schizophrenia," found a link

between increased educational levels and higher occupational status especially in those

who underwent self-help/advocacy programs (Russinova, Wewiorski, Lyass, Rogers, and Massaro, 2005).

Employment affected by mental illness

It was just shown above that educational attainment was linked to positive employment situations. Now, the negative effects of mental illness on employment will be examined. The present study looked at functionality after the diagnosis of a mental illness, and employment was a major indicator of functionality.

The first article in this section is entitled, "The Impact of Psychiatric Disorders on Labor Market Outcomes." This study looked at the data found in the National Co morbidity Survey of 2,225 men and 2,401 women and found that psychiatric disorders significantly reduced employment in both sexes. More specifically, it indicated that recent psychiatric disorders reduced employment rates in both sexes by about 11 percentage points (Ettner, Frank, and Kessler, 1997).

The second article described both mental illness and low educational attainment as predictors of no or low-ranking occupations. This article was entitled, "Employment person with serious mental illness." They defined a serious mental illness as schizophrenia, paranoid states, mood disorders, and other non-organic psychosis. While this article seemed to be consistent with previous research in the beginning, it was quickly realized that the purpose of the article was to indicate that those with mental illness are capable of and often do work. The interesting feature here was that according to their data, most (76%) of persons with mental illness were in fact employed (Mechanic, Bilder, and McAlpine, 2002).

What determines GAF scores?

The Global Assessment of Functioning scale (GAF) was the instrument used to measure functionality in the present study. It was stated as a device to measure psychological functioning, psychiatric symptoms, and social functioning. This section looks at past research and their finding on the uses for GAF.

The majority of evidence found on GAF suggests that the scores are mainly determined by symptoms and diagnosis in particular. The first article entitled, "Global Assessment of Functioning (GAF) Ratings: Determinants and Role as Predictors of One-Year Treatment Outcomes," describes exactly that idea. The results indicated that clinical diagnosis and psychiatric symptoms were greater predictors of GAF ratings than social and occupational functioning, (Moos, McSoy, and Moos, 2000). Another article that displayed similar findings was, "Major Depression in the Transition to Adulthood Risks and Impairments." The findings of this study showed that those with depression had poorer psychosocial functioning and more interpersonal relationship problems that the control population (Reinherz, Giaconia, Carmola Hauf, Wasserman, and Silverman, 1999).

The article, "Global Assessment of Functioning Following Assertive Community Treatment in Edmonton, Alberta: A Longitudinal Study," searched to see if GAF scores would change after diagnosis with continued specific education. The results indicated that while at an Assertive Community Treatment (ACT) program (quite like the program that will be used in the present thesis) the GAF scores improved at the 18 and 36-month follow-up. The amount of change was dependant on the diagnosis (schizophrenics

increase GAF to a greater degree) and the level of functioning at the time of enrollment (Tibbo, Joffe, Chue, Metelitsa, and Wright, 2001).

"Does Insight Affect Long-Term Inpatient Treatment Outcome in Chronic Schizophrenia," was a study that showed evidence that patient's insight into their diagnosis was significantly related to increased GAF. More specifically it accounted for 28% of functioning skills at the start of treatment and 50% of functioning after long-term treatment (Scwartz, Cohen, and Grubaugh, 1997).

The final GAF indicator is violence. There were two articles that showed a correlation between the decrease in GAF scores and the increase in violence. The first of these was an article by Swanson, Swartz, Estroff, Borum, Wagner, and Hiday (1998) entitled, "Psychiatric impairment, social contact, and violent behavior: evidence from a study of outpatient-committed persons with severe mental disorder," and the other was by Schwartz, Reynolds, Austin, and Peterson (2003) entitled, "Homicidality in Schizophrenia A Replication Study." The second of these articles, as indicated by its title not only linked GAF to violence, but took that a step further and found that a decrease in GAF ratings was able to predict current homicidality (Schwarts et.al., 2003).

What determines functionality?

The following studies examined the same topic as the above section but were not GAF exclusive. For example, the article "Self-efficacy and psychosocial functioning in schizophrenia: a mediational analysis," looked into functionality in general, not specific to GAF. This article suggested that negative symptoms, and not self-efficacy, were the most critical in psychosocial functioning for patients with schizophrenia (Pratt, Mueser,

Smith, and Lu, 2005). Another, nonspecific to GAF, measure of functionality was the article entitled, "Clinical profiles, scope, and general findings of the Western Sydney First Episode Psychosis Project," that showed the diagnosis of schizophrenia alone, and the symptoms that surround it, as indicators in the decrease of functionality, (Harris, Brennen, Anderson, Tayloer, Sanbrook, Fizgerald, Lucas, Redoblado-Hodg, Gomes, and Gordan, 2005). The last article in the research review was, "Diagnostic Differences Among Women with Long Term Serious Mental Illness." The results of this article stated that symptomology was dependent on the type of disorder and that this symptomology was directly related to lower community functioning (Mowbray, Oyserman, Callahan, Bybee, and MacFarlane, 2004).

Summary of findings

The present research hoped to find an impact of educational attainment prior to diagnosis on functionality after diagnosis. The past research seems to be pointing in the direction of an influence between these variables. There seems to be a definite connection between educational attainment and functionality in both normal and psychiatric populations. The higher the amount of education achieved in individuals often lead to less loss in cognitive and psychosocial functionality.

Educational attainment was also found to be both the cause and the connection between itself and certain mental illnesses, but was not related to co-morbidity or multiple psychiatric hospitalizations. This was good for the present research since any link in educational attainment and mental illness served as useful. Another connection between these two variables was found with evidence showing mental illness and its

symptoms as devastating factors affecting educational attainment.

The connection between functionality and mental illness was also found in past research. One such example was the finding that mental illness has some bearing on employment (a major indicator of functionality), but does not prevent a large number of those with mental illnesses from working. It was also shown that the type of diagnosis and the symptoms of that diagnosis, as opposed to any other characteristic, mainly determine functionality.

With all variables accounted for in past research, expectations of a successful experiment are mounting. For the most part, the findings were able to lend some credence to what was hypothesized in this thesis. There are always studies, whose findings disagree, and this search showed nothing different, but it seemed like the majority of the data was pointing in the direction of the hypothesis.

Chapter 3: Study Design

Sample

The sample for this particular research was found at a partial day program for adults with mental illnesses. This day program was located in Southern New Jersey and was comprised of individuals who were referred, for the most part, from local psychiatric hospitals after their release from these facilities. The number of individuals who attended the program at the time of the research was 136. The majority of these individual were used in the study with the exception of a few individuals. Those who were excluded from the research were those who did not have an Axis I diagnosis (some having only an Axis II or no known diagnosis) and those that did not have the necessary information in their charts. Some clients were not at the program long enough to have had their first meeting with the program psychiatrist and did not have had a current GAF score. If the client did not have a current GAF score they were not used in the study. Other clients may have been too delusional or defensive at the time of intake to give an accurate educational grade of completion record. If these same clients did not have another form of identification for this piece of information in the records received from other facilities, than they were not used for the study. In the end, there were 122 participants (57 males and 65 females) in the study as illustrated in table 3. 1.

Table 3.1- Gender demographics

Gender	Frequency (Per Individual)
Male	57
Female	65

All of the participants in the study were of the same low SES class. Those who attend the partial day program were receiving Medicaid and SSI as their main source of income and none had more than a part time job. Their SES's would have been different prior to diagnosis but this piece of information was difficult, and at times impossible, to ascertain from the available records. Therefore, SES was not used as a variable in this study.

The majority of those that were a part of the study were Caucasian (N=89), followed by African-Americans (N=26), and Hispanics (N=5). There was only one person each to represent both the Asian/Pacific Islander ethnicity and the "other" category. This can be seen in table 3.2.

Table 3.2-Ethnicity demographics

Ethnicity	Frequency (Per Individual)
Caucasian	89
African American	26
Hispanic	5
Asian/Pacific Islander	1
Other	1

Of those that participated, the majority was in their fifties, which accounted for 36 of the members. The next age group were those in their forties, making up a number of 33, and then those in their sixties, amounting for twenty-six clients. The next most popular age group were those in their thirties (N=18), followed by those in their twenties

(N=5), those in their seventies (N=3), and one member in their eighties. The ages ranged

from 21 to 82. These numbers can be better understood in table 3.3.

Table 3.3- Ages of Sample

Age Group	Frequency (Per Individual)
Before 20	0
20-29	5
30-39	18
40-49	33
50-59	36
60-69	26
70-79	3
80-89	1

The huge majority of the sample had a diagnosis with psychotic features, which

accounted for 93 of the participants. This left only 29 of the participants with a non-

psychotic diagnosis (as shown in table 3.4). A psychotic diagnosis was any diagnosis

that suffered from delusions (belief in things that are not true/realistic) and/or

hallucinations (seeing, hearing, tasting, feeling, or smelling objects/people that are not

there). This type of diagnosis may have had psychosis as its main feature (i.e.

schizophrenia) or it may have had a mood disorder with psychotic features (i.e. major

depression with psychotic features). Those diagnoses that were represented in this study

were schizophrenia (N=58), psychotic disorder not otherwise specified (N=2),

schizoaffective disorder (N=26), bipolar (N=8), bipolar disorder not otherwise specified

(N=8), major depression (N=12), impulse control disorder (N=3), adjustment disorder

(N=1), post traumatic stress disorder (N=1), generalized anxiety disorder (N=1), panic

disorder (N=1), and anxiety disorder not otherwise specified (N=1). This is better

illustrated in table 3.5.

Table 3.4- Diagnostic Features in the Sample

Diagnosis Feature	Frequency (Per Individual)
Psychotic	93
Non-psychotic	29

Table 3.5- Diagnoses in the Sample

Diagnosis	Frequency (Per Individual)
Schizophrenia	58
Schizoaffective Disorder	26
Major Depression	12
Bipolar	8
Bipolar NOS	8
Impulse Control Disorder	3
Adjustment Disorder	1
Post Traumatic Stress Disorder	1
Generalized Anxiety Disorder	1
Panic Disorder	1
Anxiety Disorder NOS	1

Another characteristic of this sample was their GAF scores (a major variable of this study). Upon admission the average GAF score was 45. 8197. The average current GAF score of those clients at HHBH was 51.5738. Since, GAF scores range from 0-100, it can be shown that the average client upon admission had a fairly low GAF score and after some time at HHBH their scores were, on average, slightly above the median GAF level. A better look at the overall GAF scores in the sample can be seen in table 3.6.

Table 3.6- Range of Current GAF Scores

Current Global Assessment of Functioning (GAF) Scores	Frequency (Per Individual)
30-39	5
40-49	31
50-59	48
60-69	38

The final characteristic of this sample was that of educational attainment level (the other major variable of this thesis). The average education level of the participants was 11.8852, which equaled that of a sophomore in high school. While, this was the average, the mode of this group was slightly higher. In fact, most participants (42 people or 30.9% of the sample) completed high school. Educational attainment ranged from zero or no formal education to that equal to a bachelor's degree (four years post-high school). This factor is illustrated in table 3.7.

Table 3.7-The Frequencies of Years of Education Attained

Years of Education Attained	Frequency (Per Individual)	Percent
0	1	.8
3	1	.8
4	1	.8
5	1	.8
7	6	4.9
8	2	1.6
9	8	6.6
10	10	8.2
11	10	8.2
12	17	13.9
13	42	34.4
14	7	5.7
15	9	7.4
16	4	3.3
17	3	2.5

Measures

The only measurements needed for this study were GAF scores (upon admission to HHBH and currently), level of educational attainment achieved, and demographics (age, ethnicity, gender, diagnosis). The GAF scores were obtained through examination of the psychiatric reviews found in each client's chart. The clients met with the

psychiatrist monthly while at HHBH and a review was completed about every three months. It was during these reviews that the current GAF score was recorded. The study used the most recent psychiatric review form located in the charts.

The Global Assessment of Functioning Scale (GAF) was located in the fourth edition of the Diagnostic Statistical Manual (DSM-IV) and was considered the fifth axis in a multi-dimensional diagnosis. The instructions for using the assessment were found in the DSM-IV and could be used to represent wellness/functionality on a scale of 1 to 100 with superior functioning as 100. It was used to gauge psychological (symptoms, etc.), social, and occupational functioning and its score was not affected by physical or environmental limitations. There was no stated age range and it seemed to be applicable for both children and adults (Schorre and Vandvik, 2004).

Past research on the GAF have shown that its inter-rater reliability depended on who was rating the patient. It was shown that psychologists and social workers rated the clients significantly lower than nurses and medical professionals (Schorre and Vandvik, 2004). In one study, 18 non-trained, clinical workers (psychiatrists, psychiatric registrars, house surgeons, trainee interns, nurses, psychologists, and social workers) were asked to give GAF scores to 97 admits to a psychiatric general hospital. The inter-rater reliability in this study was .69 when the interviews were held separately, and .80 when the interviews were held with all raters in attendance simultaneously (Fernando, Mellsop, Nelson, Peace, and Wilson, 1986). In another study, the inter-rater reliability was .62 with joint interviews and .58 for separate interviews (Schrader, Gordon, and Harcourt, 1986).

There was no "gold standard" set as a global assessment of functioning, but the

GAF was used fairly often as a tool to validate other instruments (Schorre and Vandvik, 2004). This showed that it must have had a lot of face validity in determining functionality. Any information regarding other forms of validity as well as the norming of this assessment was not found.

All of the demographic information needed as well and the level of education attained by each client was found on the intake interview form (given within the client's first four days at program by the agencies program director or agency ombudsperson) and was verified in other records obtained from hospitals and through family interviews as found in each person's chart. Most of this information was from self-reports and some was from past records, but all of the information was found in their charts. There were no interviews (for the purpose of the study) and the clients were not spoken to directly regarding this information. As stated previously, if this information was not found in the charts they were excluded from the research project.

Procedure

Before the research was begun, the researcher had to get permission from the facility in order to use the case histories. A letter was written to the program director asking for consent and authorization was granted. After the local IRB granted permission as well, the research was begun.

All of the present clients of the partial day program were selected as possible research participants. As long as the appropriate information was available in their charts they were selected. Most of the participants were Caucasian and had a diagnosis of schizophrenia, but there was a variance in diagnoses and ethnicities. The levels of

education varied as well. The majority of the clients had a high school education, but there were a significant number of participants who had less education and some who had some college experience.

Analysis Design

This design used a univariate analysis of variance. The two examined variables were the level of education achieved and current GAF scores. Each year of education completed equated to one year of education. Therefore the completion of kindergarden equaled one year of education, the conclusion of ninth grade amounted to ten years of education, the completion of the first year of college equaled fourteen years of education, and so on. However, since these numbers were so skewed in a manner favoring those that completed high school, with little representation on extremes of the educational levels, these grades needed to be put into categories. Those that completed grade levels between kindergarten and sixth grade (elementary school) were in the first category, those that completed seventh or eighth grade (middle school) were in the second category, nine to twelfth grade (high school) were in the third category, and those completing any formal education above high school were in the fourth category. The result of this analysis was the most important to the study and can be seen in table 3.8.

Table 3.8- Educational Categories

Years of Education Attained	Category	Frequency (Per Individual)
0-7	Elementary	10
8-9	Middle School	10
10-13	High School	79
14-19	College	23

The other univariate analysis of variance used the variables of the feature of the diagnosis (was it a psychotic disorder or non-psychotic) and the GAF scores (both on admission and current). In order to have a diagnosis that would be considered to be psychotic, it would need to have psychotic features or be inherently psychotic due to the diagnosis itself (i.e. schizophrenia).

The last univariate analysis of variance was used to find any relationship between the demographic variable of ethnicity and the GAF score. Ethnicity was broken into the categories of Caucasian, African-American, Asian/Pacific Islander, Hispanic, and other.

As a follow-up analysis, a paired sample T-tests was performed. These tests looked to find a correlation between the means of the GAF scores from that of admission and currently. There were also a number of frequencies tabulated and some cross-tabulation was performed.

Hypothesis

The hypothesis of this thesis is that there was no effect of the level of education attained on the current GAF scores. This positive relationship should continue in a fairly predictable manner, but was predicted to level off at the college level. It was not suspected that someone with a master's degree would have a higher level of functioning than someone with a bachelor's degree for example. It was also hypothesized that the diagnosis itself may have played a part in the level of functionality. It was believed that those with psychoses would have lower functioning scores despite their level of education. The final part of the hypothesis was that gender and ethnicity would play no significant role in the relationship between educational level and GAF scores.

Summary

This section discussed the sample demographics, sample size, measurements used, procedure, analysis design, and hypothesis of the present study. With a large sample size and a fairly valid and reliable assessment such as the GAF, this thesis should serve as a good source to those interested in the impact of educational attainment on functionality scores. This section provided enough detail to ensure that others who wish to replicate this study have the tools to do so.

Chapter 4: Results

Restated hypotheses

The purpose of this study was to examine four main hypotheses. The first and main objective was to find a significant impact of educational attainment prior to the diagnosis of a mental illness on functionality (as indicated by GAF scores) after diagnosis of a mental illness. The premise was that the more education achieved prior to diagnosis the better levels of functionality one would have after diagnosis. The second hypothesis wanted to look for any possible plateau that may be achieved. In particular, it was believed that a college level education would have no greater effect on functionality than that of a high school education.   The third hypothesis was that the type of diagnosis (psychotic or non-psychotic features) would have a significant impact on the functionality of that client after diagnosis. More specifically, it was believed that the psychotic features of the disorder might make the functionality lower despite the level of education achieved. The final hypothesis was that ethnicity would have no predictive value over the functionality of that client.

Results

In reference to my first hypothesis, results indicating that there was a significant impact of educational attainment prior to the diagnosis of a mental illness on functionality after diagnosis were split. The univariate analysis of variance showed that there was not a significant difference in GAF scores upon admission to HHBH due to the

grade level completed. This indicated that upon entering the program, the functionality

of the client was not affected by the educational attainment. However, this result

changed as time went on at the program. A significant difference (F = 4.026, dF 3,118,

p<_ 0.009) was found in the current GAF scores due to the grade level completed. The

most recent reading of functionality while at program seemed to be linked to the amount

of education the client received prior to diagnosis. Therefore, the results of this test

confirmed statistical significance only when examining the current GAF scores.

Therefore, the first hypothesis was partially upheld and can be seen in graph 4.1.

Graph 4.1- Current GAF Scores due to Grade Level Completed
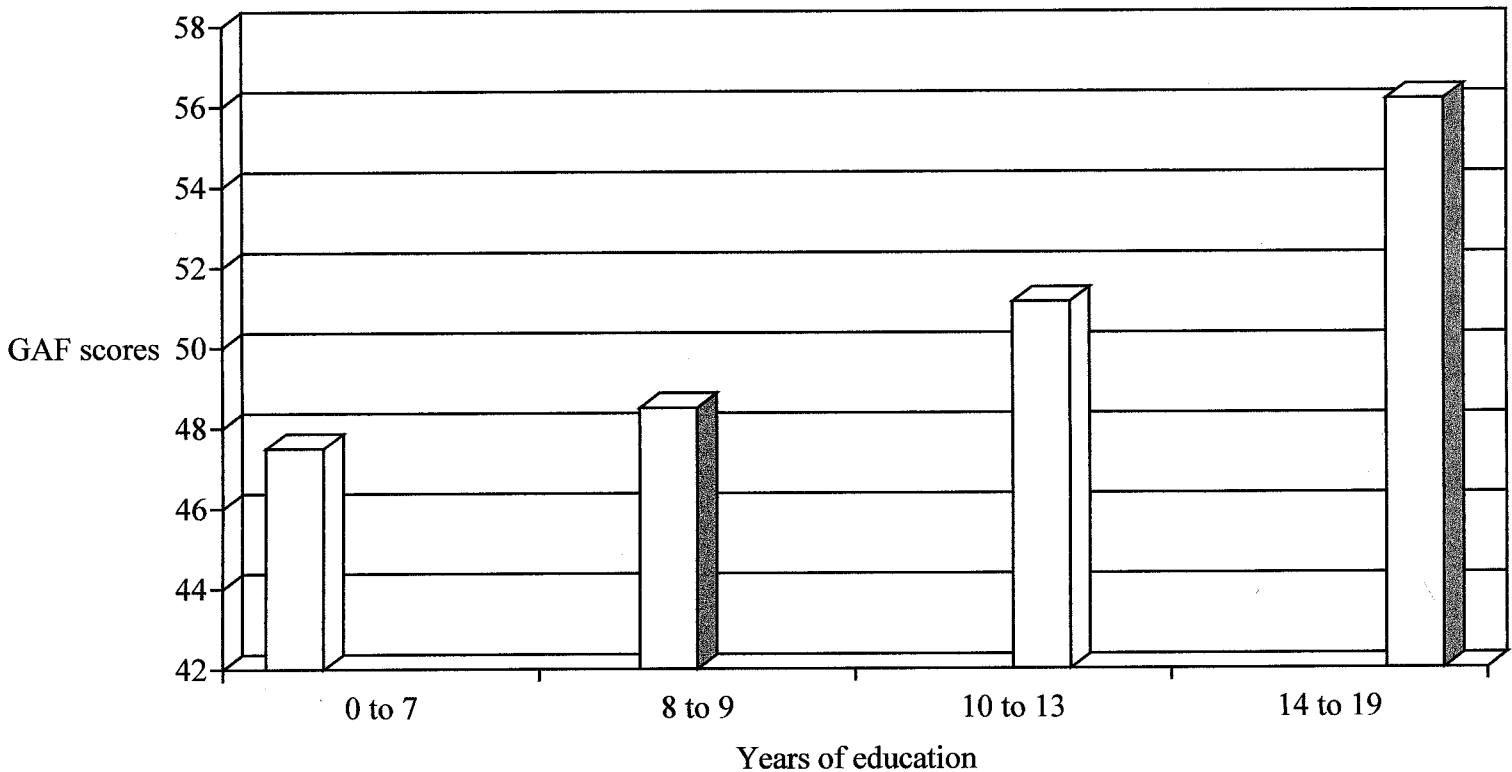
The second hypothesis, which looked to find a plateau in the directionality of the correlation for the above hypothesis, was not upheld. The functionality steadily rose as each educational category increased. In the elementary level, the average functionality score (current GAF) was 47.5. At the middle school level, the average functionality score (current GAF) was 48.5. The high school level showed another increase in the average score with that of 51.14. The larges increase in scores was seen in those that attained a college education. Their average current GAF scores were 56.17. Therefore, it was shown that the impact of educational attainment on functionality scores continued into college level education, which made the second hypothesis unsupported.

In reference to my third hypothesis, regarding the type of diagnosis (psychotic or non-psychotic) and its impact on the functionality of the client, the results were not confirmed. According the univariate analysis of variance, there was not a significant difference in GAF scores upon admission due to psychotic features of the diagnosis just as there was no significant difference in current GAF scores due to psychotic features of the diagnosis. Unlike that of the relationship between functionality and educational attainment, the amount of time spent at the program made no difference in the creation of a stronger relationship between these two variables.

The final hypothesis, indicating that there was not predictive value of ethnicity on GAF scores, was maintained through the data. The univariate analysis of variance specifically indicated a non-significant difference in GAF scores upon admission to the program due to the ethnicity of the client.

Some observational data was found using a paired sample t-test. This test showed a significant difference (t = -7.230, dF = 121, Sig <_ 0.000) in the means of the GAF

scores upon admission to the program and the mean of the current GAF scores found in their charts. Upon admission the mean GAF score was 45.82. As time went on, the clients showed a significant increase in functionality scores. The current GAF score of those clients at the program averaged at 51.57.

Summary

This chapter summarized the results of the data. There was a significant impact found on current GAF scores due to the grade level completed, but there was not a significant impact found when looking solely at the GAF scores upon admission. The significant impact in current GAF scores continued into the college educational category, showing that a plateau was not found after the high school level. It was also established that neither the original GAF scores nor the current GAF scores had a significant impact due to the type of diagnosis, whether it was with or without psychotic features. And finally, ethnicity showed no significant impact on the functionality scores of the participants in this study.

Chapter 5: Discussion

Rationalization of results

      This study resulted in a number of expected results as well as in outcomes that were completely unforeseen. The main hypothesis was that there would be a distinct, significant impact of the levels of education attained before diagnosis of a mental illness on the functionality after the diagnosis. After the results were tallied, it was found that this hypothesis was only substantiated when looking at current functionality scores (using the GAF as its measurement), and that if the GAF scores arrived at upon admission to the program, instead of more recent scores, were used, the same significant results were not found. There could be a number of reasons for such a conclusion.

      It is possible that the additional time spent at the partial day program, allowed for a further adjustment period to the symptoms of each diagnosis. Once the adjustment period was fully experienced the client's original cognitive talents were able to regain power. Therefore, as shown in Beck's (1976) work, what was once known to the patient (because of his or her past educational experiences) could now be reintroduced during unfamiliar situations. Any experience would feel new when complicated by the symptoms of a mental illness, but the past educational attainment allowed for a field of reference for the client, and once the novelty of the symptom impediment wore off the client was able to increase in functionality.

      Also, while the original hypothesis claimed that it was the education prior to diagnosis that would make a difference in functionality scores, it may be that the

continuing of education, in general, was the key. HHBH was an educationally based

program that allowed each client to experience about seven groups a day, for as many as

five days a week. The vast majority of these groups were educationally based. It was

possible that these groups not only assisted the clients in re-gaining previously held skills,

but also that it allowed some to realize these skills for the first time. Each of these

abilities, if attained, would have had an impact on the functionality of the individual.

It should also be noted that there was a significant difference between the GAF

scores upon admission to the program and those scores after time spent at HHBH as

verified through the t-test. This exemplified the fact that something, most likely in

relation to the program itself, was raising the GAF scores of all clients, despite the

amount of education received. However, it must be seen that there was still a significant

increase in current GAF scores with each increase in educational attainment. This result

indicated a definite relationship between the two variables, which may or may not be due

to the program services.

The psychotropic medications prescribed to nearly every individual (by the

psychiatrist at HHBH) in this study also may have been a factor that explained the

phenomenon that educational attainment had a impact only on current GAF scores as

opposed to all functionality scores. Psychotropic medications aided in the stabilization of

moods and in symptom reduction. With moods altered for the better and symptoms as

less of a burden, the abilities once established through previous education now had a

chance through which to shine.

There was also, a major likelihood that there were outside variables having an

impact on these results. It may not have been the curriculum at HHBH that was making

the difference, but it may have been the stability of the environment or the supportiveness of the staff, that was making an impression on impact of educational attainment of functionality. Perhaps it was because the staff members at this facility were expected to have degrees in college and therefore may have better related to those individuals who had been in similar educational settings. The extraneous variables were unending due to the fact that the sample in this study was not randomly selected from the huge population of adults with mental illnesses.

The second hypothesis stated that the increase in functionality in relation to the increase in educational attainment would level off by the college years. This thought was not verified through the data however. The rationalization behind this result may have lied in the limited nature of the sample size. Out of the 122 participants in this study, only 23 had experience in college-based education. Seven individuals had only one-year post-high school education; nine clients had two years of college, four had three years, and only three individuals had four years of education at the college level. Because of these small numbers, it was not statistically significant to look at the relationship on a single year basis. However, if it was possible to look at first year college students in comparison to four-year college students, this plateau may have been more evident. Instead of this scenario, conversely, the college years were made into one category of educational attainment, and even then the representation of this group of people was minimal.

The increase in functionality that was associated with the attainment of college level education may also have been attributed to the fact that college offered instruction in skills essential to functionality that may not have been offered at the high school,

middle school, or elementary levels. In college there were a lot of abstract concepts taught throughout the curriculum and tests examined more than memorization at this level. It was possible that this form of thinking and learning may have been more essential to functionality at a more basic level than once thought.

It was also possible that it was simply the amount of years, literally, spent symptom free that could have accounted for this increase in functionality after diagnosis. It may not have been the education that was making the difference but instead the socialization skills learned and coping skills accomplished through simply living life for approximately 20 years or more (without the symptoms of a mental illness) that accounted for the change in functionality after diagnosis.

The results of tests examining the third hypothesis also proved to be inconsistent with the original thought. It was previously believed that the type of diagnosis, whether it was a diagnosis with psychotic symptoms or one without such symptoms, would show a significant difference on the functionality of the client. The data proved otherwise, and showed that psychosis played no part. The clients showed an increase in functionality that was in harmony with the increase in educational attainment when they had both psychotic and non-psychotic elements of their mental illness. There could have been two possible explanations for this phenomenon.

The first was that the sample used in this study was skewed in favor of participants with psychotic symptomology. Of the 122 clients used in this study 93 of them experienced delusions and/or hallucinations. This indicated that over three quarters of the clients at HHBH had psychotic symptoms. The fact, that the overwhelming majority of the participants were in fact psychotic may have certainly had effect on the

results of the study.

The second possible explanation of this conclusion again pointed to the fact that most of the clients at HHBH were taking psychotropic medications (including anti-psychotic medications) on a fairly regular regimen. Since these medications greatly reduced the severity of and frequency of these symptoms, the impact that hallucinations and delusion had on functionality was masked. Therefore, it cannot be assumed that these results would generalize over to a population of adults with mental illness who were not being treated with anti-psychotic medications.

The final hypothesis of this study was confirmed through the data. It was shown that the ethnicity of the participants had no bearing on the relationship between educational attainment prior to the diagnosis of a mental illness and the functionality after the diagnosis. This seemed to result in such a matter because all ethnicities were capable of learning at all levels of education equally and was able to absorb the skills necessary for functionality in the same way. It was also shown that all ethnicities could be diagnosed with a mental illness and in some cases, such as that of schizophrenia (the number one most prevalent diagnosis among these participants), it affected all ethnicities in similar numbers.

Results in relation to past research

The results of this study seemed to indicate a significant impact of the level of education attained on functionality after being diagnosed with a mental illness. This was in connection with the results found in past research. Ciapparelli et. al. found that education was a significant ($p < 0.05$) predictor of the "functioning outcome" (tested

through GAF scores) of patients with similar diagnoses as those participants in the present study (2004). Schretlen et. al. showed that fewer years of education ($r = .29$, $p < 0.01$) were associated with greater functional impairment in individuals with schizophrenia (the most prevalent diagnosis of those clients in this study). Evans et. al. also found that there was a significant correlation of functional capacity in those individuals with schizophrenia (2000). With four separate studies that indicated a similar relationship between the functionality of persons with mental illness and the level of education that they received, it seems very likely that this affiliation was fairly reliable.

Even when evidence mounted in favor of this hypothesis, research that pointed in the opposite direction could not be forgotten. Job maintenance was a major aspect of functionality, and success in this area was accounted for in GAF scores. However, in the Perivoliotis et. al. (2004) study, it was found that higher education was actually associated with worse job maintenance scores in adults with mental illness. Still, it must be reiterated that job maintenance was only one area of functionality, and the study done by Perivoliotis et. al. was only a single account.

Future research

This research used a large sample of mentally ill adults and was able to use an expansive number of historical charts to verify functionality amongst these individuals. The results showed a significant impact between the two variables (educational attainment and current functionality) and were consistent with the results of previous studies. With that being said, there is always room for improvement and future studies could expand the current body of knowledge in this area as well as move into a similar

but separate direction.

This study focused on a population of medicated adults from one area of New Jersey. The sample consisted largely of Caucasian individuals with diagnoses coupled with psychotic symptoms. This limited geographical and demographic sample could greatly affect how it would be generalized to the mentally ill population as a whole. Therefore, future research could help to inflate global implications of this research by using a more diverse sample.

Patients that are still presently hospitalized could be a very telling population as well. Those who are still in a hospital setting may be viewed at a time that is closer to the original diagnosis. This time frame would make the possibility of education after diagnosis more minimal. Patients in mental hospitals also may not have found medications that are effective for them or may not yet be at a therapeutic level. The change in functionality scores would be much different in these scenarios.

The present sample also used individuals with average GAF scores that were fairly low. A sample of individuals with average GAF scores above 60 may prove to have completely different results.

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