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THE EFFECT OF DISABILITY TYPE--VISIBLE OR NONVISIBLE--ON THE
ACCEPTANCE OF DISABILITY AND SELF-CONCEPT OF PHYSICALLY
DISABLED UNIVERSITY STUDENTS

The University of Arizona

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THE EFFECT OF DISABILITY TYPE--VISIBLE OR NONVISIBLE--ON THE
ACCEPTANCE OF DISABILITY AND SELF-CONCEPT OF
PHYSICALLY DISABLED UNIVERSITY STUDENTS

by

Stephanie Stachowski Thvedt

A Dissertation Submitted to the Faculty of the

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For the Degree of

DOCTOR OF PHILOSOPHY

In the Graduate College

THE UNIVERSITY OF ARIZONA

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THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the Final Examination Committee, we certify that we have read
the dissertation prepared by Stephanie Stachowski Thvedt

entitled THE EFFECT OF DISABILITY TYPE--VISIBLE OR NONVISIBLE--ON
THE ACCEPTANCE OF DISABILITY AND SELF-CONCEPT OF
PHYSICALLY DISABLED UNIVERSITY STUDENTS

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SIGNED: Stephane Stachowski Ihuedt

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ABSTRACT

The purpose of this study was to examine the relationships among disability type, self-concept, acceptance of disability, number of incorrect diagnoses, length of time between onset of symptoms and diagnosis, and length of time between diagnosis and the present.

The subjects of this study were 80 physically disabled students at The University of Arizona and Arizona State University; 42 students had visible disabilities and 38 students had nonvisible disabilities.

Subjects were administered the Acceptance of Disability scale, the Tennessee Self-Concept scale, and a demographic questionnaire. Completion of these measures was through personal interview.

Data were analyzed by several statistical procedures. The Pearson correlation coefficient was used to examine relationships among the variables. T-tests were used to explore differences between disability type, sex, GPA, and the number of incorrect diagnoses. Analyses of variance were conducted to test for significant differences in disability type, self-concept, and acceptance of disability.

Study results indicated that disability type did not have a statistically significant effect on self-concept or acceptance of disability. No significant relationship was found between self-concept and either length of time between onset of symptoms and diagnosis or length of time between diagnosis and the present. While no significant relationship occurred between acceptance of disability and length of

time between diagnosis and the present, the length of time between onset of symptoms and diagnosis did have a statistically significant effect on acceptance of disability. No significant relationship was found between number of incorrect diagnoses and disability type or sex, but a significant relationship did exist between number of incorrect diagnoses and acceptance of disability and some measures of self-concept. Acceptance of disability was found to be predicted by self-concept.

Recommendations included the revision of the Acceptance of Disability Scale, similar research to be conducted with a less homogeneous population, the use of subjects who not only met medical criteria for participation in the study, but also considered themselves disabled, and the use of subjects having a more restricted group of nonvisible disabilities.

CHAPTER 1

INTRODUCTION

Introduction to the Problem

The literature in the fields of rehabilitation and psychology tends to emphasize the psychosocial aspects of visible disability (Stubbins, 1977), while the psychosocial aspects of nonvisible disability have been discussed only on a limited basis (Wu, 1963). A visible disability is a chronic medical condition which is easily apparent by casual observation. Some examples of visible disabilities are paralysis from spinal cord injury, amputation and cerebral palsy. A nonvisible disability is "a condition in which the medical condition is unapparent or not readily apparent by casual acquaintance" (Falvo, Allen and Maki, 1982, p. 2). Epilepsy, diabetes, and asthma are examples of nonvisible disabilities.

There is great need for information and research about non-visible disabilities and the psychosocial impact they have on persons having them. According to the National Institute of Health (1982), the ten leading chronic medical conditions in the United States in 1982 were, in order of greatest occurrence, (a) orthopedic impairments, (b) arthritis, (c) cardiac conditions, (d) hypertension, (e) diabetes, (f) visual impairments, (g) asthma, (h) disc displacements, (i) emphysema, and (j) hearing impairments. Although no statistics are

available to show how many persons have nonvisible disabilities in total, it is worth noting that most of the cited chronic medical conditions are potentially nonvisible disabilities. An understanding of the psychosocial factors of nonvisible disability is vital to ensure that nonvisibly disabled persons can be accurately identified and placed into appropriate rehabilitation services.

Statement of the Problem

The physical appearance of a human being is the most obvious aspect of the total individual that is observed by others. The human figure is regarded as acceptable, in most societies, only when it has a typical appearance. When that appearance is atypical, it is associated with such negative concepts as "useless burdens," "crippled in body means crippled in mind," or "results of God's punishment" (Wu, 1963). These unfavorable attitudes by society towards disabled persons often results in disabled individuals, especially those with visible disabilities, judging themselves the same way.

Do those who have nonvisible physical impairment escape the unfavorable attitudes of others? Or, if they are not subject to negative attitudes on the part of society, are they better adjusted to their disability than those with visible physical disabilities? Thus far, no research has been done to provide answers to these questions.

Any individual with a disability undergoes some disruption of role pattern, some revision of self-concept, and a period of adjustment to disability (Wright, 1980). The extent of the adjustment may not

depend on the severity of the disability as much as on the individual's perception of the resultant limitation imposed by that disability.

Persons with visible disabilities are continuously exposed to environmental feedback which reminds them of their disability. Although possibly unpleasant, this scrutiny forces the incorporation of their disability into their perception of self and life. Persons with nonvisible disabilities, because of their outward appearance of normality, may not be exposed to that same feedback, and may not perceive a reality for themselves which includes their disability. Because of the hidden nature of a nonvisible disability, it is possible for persons with nonvisible disabilities to deny the existence of their disability for long periods of time, and thus to exclude themselves from a support system and necessary medical or psychological treatment. Therefore, it may be proposed that individuals with nonvisible disabilities are more likely to postpone the adaptation process and be less likely and able to accept their condition realistically (Falvo et al., 1982).

Significance of the Problem

Although some of the psychosocial factors influencing the rehabilitation of persons with visible and nonvisible disabilities may be similar, persons with nonvisible disabilities experience unique problems which may hinder the rehabilitation process (Falvo et al., 1982). One such factor is delayed diagnosis or incorrect diagnosis. A nonvisible disability may develop gradually and, in its early stages, be hard to distinguish from other, less serious illnesses. Zimmer (1980) addressed this problem with reference to early multiple

sclerosis; he stated that when no physical cause for his symptoms could be found, his physician dwelt repeatedly on emotional reasons for his illness and decided that his physical problems were caused by some kind of mental conflict.

Another unique characteristic of nonvisible disability is the lack of identification with others having similar conditions. Not all disabled persons actively seek role models who are likewise disabled, yet a visibly disabled individual can easily observe others in similar situations and may learn guidelines for social behavior and problem solving from them. Persons with nonvisible disabilities often have few group supports and may not learn until late in life that their problems are shared by others having the same disability, some of whom have learned ways of managing those disabilities (National Institute for Handicapped Research, 1982).

An uncertain prognosis and changeable disease presentation are two other factors distinguishing visible from nonvisible disability. The reaction to the stress and ambiguity of an uncertain prognosis can cause a person with a nonvisible disability to withdraw socially, possibly limiting interpersonal, vocational, and even intellectual development (Wright, 1980). In describing the disease systemic lupus erythematosus, Aladjem (1983, p. 205) said that it is "a disease with an unpredictable diagnosis and symptoms that are difficult to explain. It is intermittent, recurrent, and it nibbles away at the will to live and the ability to cope." It seems that an uncertain prognosis produces much false hope during times of decreased disease symptoms. In many cases, these periods are followed by exacerbations which produce

discomfort and functional difficulty. This pattern is harder to adjust to than continuous disease activity (Aladjem, 1983).

Another issue differentiating visible from nonvisible disability is the expectation of normality (Wright, 1980). Persons with visible disabilities have obvious impairments and those they interact with base behavioral expectations on this fact. Persons with non-visible disabilities may not be perceived of as having a disability, and consequently may feel social pressure to act as if no disability existed. The behavior of the nonvisibly disabled individual may be misunderstood and people around might become distrustful. The non-visibly disabled person may be labeled as a hypochondriac or worse--a person who always finds an excuse for poor performance (Aladjem, 1983).

Another consideration distinguishing visible from nonvisible disability is the lack of control and finality that may be experienced by those persons with nonvisible disabilities (Falvo et al., 1982). Persons having a visible disability have an obvious loss that can be confirmed, and although complications may occur, their initial loss is well established. They may begin immediately to adjust their life style and acquire new skills to replace the old. This may not be the case for persons with a nonvisible disability. Since their loss is not apparent, uncertainty might exist as to the extent of their loss, methods of adaptation, and prognosis. The individual is required constantly to adjust and adapt to new functional limitations, causing difficulty in resolving the issue of loss, and making the acceptance of nonvisible disability more difficult.

Wright (1980) cited the need for self-management of the disability as the most important characteristic of nonvisible disability. Since others are not aware of the disability, the individual alone must be responsible for maintaining medical protocol and good health. This may be difficult when others do not understand that a disability exists, because the disabled individual may experience social pressure to also act as if the disability did not exist, even at the expense of medical necessity.

Purpose of the Study

This study was designed to increase knowledge about the non-visibly disabled population. It focused on physically disabled university students at The University of Arizona and Arizona State University. Specifically, the purposes of the study were to:

- 1) determine the effect of disability type--visible or non-visible--on self-concept and acceptance of disability, and
- 2) determine the degree of the relationship between disability type, self-concept, acceptance of disability and the other variables of the number of incorrect medical diagnoses, the length of time between first appearance of physical symptoms and medical diagnosis, and the length of time between medical diagnosis and the present.

Research Hypotheses

The following research hypotheses were investigated, and were tested at the .05 level of significance. They are stated in null form.

HO₁: There is no significant relationship between disability type and self-concept as measured by nine subscales of the Tennessee Self-Concept scale (TSCS).

HO₂: There is no significant relationship between disability type and acceptance of disability as measured by the Acceptance of Disability (AD) scale.

HO₃: There is no significant relationship between self-concept as measured by nine subscales of the TSCS and the length of time between the first appearance of physical symptoms and medical diagnosis.

HO₄: There is no significant relationship between self-concept as measured by nine subscales of the TSCS and the length of time between medical diagnosis and the present.

HO₅: There is no significant relationship between acceptance of disability and the length of time between the first appearance of physical symptoms and medical diagnosis.

HO₆: There is no significant relationship between acceptance of disability and the length of time between medical diagnosis and the present.

HO₇: There is no significant relationship between disability type and the number of incorrect medical diagnoses.

Assumptions

- 1) The population of the study is regarded as homogeneous and a representative sample of the disabled population.

- 2) Despite the wide variety of disease entities presented by nonvisibly disabled subjects, enough similarities are present to consider them a homogeneous group.
- 3) The exclusion of learning disabled students from the nonvisibly disabled group will not affect or confound the study results.
- 4) Self-concept can adequately be measured by the Tennessee Self-Concept scale, and acceptance of disability can be adequately measured by the Acceptance of Disability scale.

Limitations

This study was limited to physically disabled students enrolled at The University of Arizona, Tucson; and Arizona State University, Tempe. Since these students are not necessarily representative of physically disabled students attending other postsecondary educational institutions, care should be taken in generalizing study results beyond the population used.

Students with learning disabilities were excluded from this study because the investigator felt that the unique characteristics and problems a learning disability presents could not be adequately addressed in this study. Throughout the literature, however, learning disabilities are referred to as "nonvisible, invisible, or hidden" disabilities (Hullinger, 1981; Morris, 1980; Stone, 1983; and Williams, 1971). Caution should be used in extrapolating the results of this study to the learning disabled population.

Definition of Terms

Disability: "A long term or chronic condition medically defined as a physiological, anatomical, mental or emotional impairment resulting from disease or illness, inherited or congenital defect, trauma, or other insult (including environmental) to mind or body" (Wright, 1980, p. 68).

Visible Disability: Those conditions in which the medical condition is apparent, without difficulty, by casual observation.

Nonvisible Disability: "Those conditions in which the medical condition is unapparent or not readily apparent by casual acquaintance" (Falvo et al., 1982, p.

Disability Type (DT): The condition of a disability being either visible or nonvisible according to the above definitions.

Physically Disabled University Students: Individuals having a disability, according to the above definition, who require specialized services in order to ensure optimum academic and social functioning on campus.

Self-Concept (SC): The perception of one's personal characteristics, attached values, concepts of self in relation to others, and goals and ideas which are either positive or negative.

Acceptance of Disability (AD): The state of mind that occurs when the disabled individual no longer views the disability as devaluing. The disability may be seen as limiting and inconvenient, but the person strives to improve those aspects that can be improved.

Summary

Chapter 1 included a discussion of the problem and its significance, the research hypotheses tested, the assumptions, limitations and purpose of the study, and the definitions of terms used.

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter is a review of the literature pertaining to this study. The first section focuses on the psychosocial aspects of non-visible disability, a comparison of visible and nonvisible disability, and research studies which utilized visibly and nonvisibly disabled subjects. Also included are articles about university students with nonvisible disabilities. The second section discusses acceptance of disability, factors which affect it, and its implications for the rehabilitation process. The third section focuses on self-concept, while the fourth section describes the relationship between acceptance of disability and self-concept.

There have been no empirical research studies concerned solely with nonvisible disability. Neither has there been research done examining the relationship between visible and nonvisible disability per se. Acceptance of disability and self-concept has not been discussed in research studies using visibly and nonvisibly disabled subjects.

A computerized literature search was conducted utilizing seven data bases (Clearinghouse for Mental Health, Dissertation Abstracts, Educational Resources Information Center, Exceptional Child Education Resources, Medline, Psychological Abstracts, and

Sociological Abstracts). This search produced only one reference directly related to the psychosocial aspects of nonvisible disability. Two unpublished doctoral dissertations were located which attempted to research questions related to disability type. A small number of articles were found which described studies utilizing visibly and non-visibly disabled subjects, but research hypotheses were not related directly to disability type. Two references were located which addressed the topic of university students with nonvisible disabilities.

It is important to note that past research about the disabled population routinely utilized subjects with a variety of disabling conditions. Persons with polio, amputations, or spinal cord injury were all considered "disabled," and thus a homogeneous group for research purposes. This is not the case with research in the area of nonvisible disabilities. The very few studies which have been conducted tended to use subjects with a single disease entity, and to focus on a medical rather than a disability perspective. It becomes exceedingly difficult, then, to extrapolate the results of research with extremely small, disease specific samples to the nonvisibly disabled population as a whole. This may account, in part, for the apparent lack of information and research about nonvisible disabilities.

Nonvisible Disability

Falvo et al. (1982) proposed that there are psychosocial factors unique to persons with nonvisible disabilities which may impede the rehabilitation process for them. They defined "nonvisible disability" and discussed the scope of the problem, stating:

Although many factors may contribute to the individual's adaptation or adjustment . . . their perception or misperception of the reactions of others may also be a crucial factor in their level of acceptance . . . individuals with invisible disabilities may be . . . less willing or able to accept their condition realistically (Falvo et al., 1982, p. 3).

The study detailed problems unique to nonvisible disability such as the rate of diagnosis, the degree of social validation, the affiliation with others having similar conditions. Additionally, the lack of control and finality experienced by those with nonvisible disabilities were discussed with reference to their psychosocial effects. The authors also included sections describing the use of denial in non-visible disability, and acceptance of the sick role in the adaptation process. Falvo et al. (1982, p. 6) concluded:

Since a central core of psychological aspects of invisible disability may have to do with the psychodynamics of loss and the extent to which the individual was permitted to mourn a loss, the rehabilitationist must assist the client in mourning any loss outwardly, thus bringing acceptance of the condition and subsequent limitation . . . perhaps the most important goal in the rehabilitation of clients with invisible disability is that of prevention.

George Wright (1980), in Total Rehabilitation, included a section on "invisible limitation" in his chapter on "Functional Limitations." He classified unapparent limitations into five main categories: neurological disorders, malignancies, organ and gland dysfunctions, mental and emotional disorders, and other human problems. Also discussed were what he considered the four characteristics of nonvisible disability: 1) they are unapparent to other members of society; 2) the need for self-management of the disability (he named this as the most important characteristic); 3) a tendency to fail to

accept the disability psychologically; and 4) the expectation of normality. The problem of ambiguity was also discussed.

Visible and Nonvisible Disability

Barron (1952) compared aspects of personality in visibly and nonvisibly disabled subjects. Using the Wechsler-Bellevue Intelligence test, sentence completion, and Rorschach test scores with 30 males (15 with visible disabilities such as polio or amputations, and 15 with nonvisible disabilities such as TB or rheumatic heart disease), he concluded that a separate personality pattern could not be established for individuals with visible physical disabilities and those with non-visible physical impairments. His results did indicate that the nonvisible group was more conforming and the visible group more labile.

Wu (1963) tested 35 recently disabled males with either a visible orthopedic disability or a nonvisible cardiac problem to determine if there were differences between the two groups in 1) understanding the cause of their disability; 2) views on the medical care they received; 3) understanding of the limitations of their disability; and 4) adjustment. Interviews and the Bell Adjustment Inventory (Adult Form) were used. Wu found no significant differences in adjustment between the two groups, but his results indicated that the nonvisibly disabled group blamed themselves for their disability while the visibly disabled group blamed others. The other difference was that the visibly disabled group indicated a much higher desire to learn about their disability than did the nonvisibly disabled group.

During the last 15 years, a small number of studies have been conducted to investigate issues relevant to persons who have visible and nonvisible disabilities.

In a study of housing preferences, subjects were asked to choose between 1) housing designed only for the physically disabled; 2) mainly for the nondisable but accommodating some disabled; 3) mainly for the disabled but accommodating a few nondisabled; and 4) housing for the physically disabled and elderly. It was found that persons with nonvisible types of problems, such as cardiovascular, internal or respiratory difficulties, strongly rejected living in housing designed for disabled persons. In contrast, those with visible disabilities, such as orthopedic or neurological disorders, appeared to favor housing designed for disabled persons. The visibility factor, then, seemed to influence housing choices (Columbus and Fogel, 1971).

Zara (1970) studied the expectation of social reactions towards the self in both visibly and nonvisibly disabled persons. He found that persons with visible disabilities anticipate social rejection more often than persons with nonvisible disabilities. This implies that a nonvisible disability does not change habitual expectations of social approval of self; presumably because of the nonapparent nature of this "culturally disesteemed condition" (Zara, 1970, p. 404).

Potential employers of disabled persons were tested by Cole and Bragman (1982) to see if realistic and appropriate work situations could be identified for both visibly and nonvisibly disabled persons. The study found that employers were able to identify realistic jobs for those with visible disabilities, but were unable to do so for

those having nonvisible disabilities because of the lack of information about the functional limitations of specific nonvisible disabilities.

A study of the social status of nondisabled, nonvisibly disabled, and visibly disabled participants at a boys' camp produced evidence that the visibility of a disability contributed to social disadvantage. Richardson et al. (1974) found that visibly disabled boys were least preferred, nonvisibly disabled boys were in an intermediate position, and nondisabled campers were most preferred. This study stated that the degree of visibility of a disability must be taken into account when evaluating how well a disabled child gets along with his peers.

Steinhausen (1981) studied personality in three groups of adolescents: disabled (visible), chronically ill (nonvisible), and healthy. When compared to healthy subjects, the disabled group was found to be significantly different on several measures. The nonvisible group, however, did not differ from healthy controls. It might be assumed, then, that the degree of visibility of a disability plays a major part in the ability of persons to cope with their disability. The study concluded that psychosocial functioning may be easier for the nonvisibly disabled group than for those with visible disabilities.

Goldberg (1974) studied visibly and nonvisibly disabled children, using ten measures of adjustment. Significant differences were found, with better adjustment indicated for the nonvisibly disabled group. It was found that the visibly disabled were more vague in reference to vocational aspirations, lacked plans for post-high school careers, and had little interest in work at all. The nonvisibly

disabled group, however, had greater vocational aspirations and interest in future employment.

One issue common to the area of nonvisible disability is the assumption that the problem cannot be seen. There is little incentive to deal with something that is not noticeable; in fact, people do not deal with that of which they are unaware. Cromes (1979, p. 2) suggested that the general mission regarding nonvisible disabilities, therefore, is to make them visible or noticeable, because "then important elements in society that present barriers to personal and vocational adjustment will be forced to think about and deal with such problems."

According to Perlman (1979), the overriding commonality of nonvisible disabilities is the fact that although there are persons with nonvisible disabilities who function well in a variety of employment settings and occupations, there are also those functioning at a minimum level who are entitled to the best resources available to enhance their potential for rehabilitation. Perlman made the following recommendations to those serving clients with nonvisible disabilities:

- 1) There is a need for effective interagency cooperation, e.g., between medical professionals and public/private support programs.

- 2) There is a need to deal with attitudes and stigma regarding nonvisible disability, including family, employer, professional and client attitudes. Myths and stereotypes are perpetuated by negative attitudes on the part of any of the above.

- 3) Psychosocial and mental health problems are fairly common to those adapting to a nonvisible disability and may involve fears,

depression, loss of self-esteem, and dependency. In order to enhance the client's potential, professionals and paraprofessionals need to develop a keen understanding of these processes.

4) Self-help/peer groups should be further developed since they may provide a valuable human resource in the rehabilitation process.

5) To optimize client services, the "rehabilitation team" approach should also be applied to those persons with nonvisible disabilities, as it is to other groups.

6) Similar employment and problems of job placement exist. Employers need better information about the applicant and also about non-visible disabilities in general, in order to lessen fears and stereotypes.

Physically Disabled University Students

American institutions of higher learning have had students with some form of disability since their beginning (DeLoach and Greer, 1981), but substantial numbers of disabled students were not evident in postsecondary education until the emergence of Section 504 of the Rehabilitation Act of 1973 (Federal Register, 1977). It was this piece of legislation that mandated program accessibility for all students with disabilities, and the need to initiate programs for those students classified as severely disabled. As the number of disabled students attending postsecondary educational institutions increased, so also did the group of professional service providers and the body of professional literature.

References addressing the issues and concerns of disabled university students are limited in number. Some of the most accurate, comprehensive and current articles about disabled students are found in the annual volumes published by the Association on Handicapped Student Service Programs in Postsecondary Education. The majority of these articles about disabled students appear to emphasize services to the severely disabled population. The only group of students with nonvisible disabilities which gets consistent attention are those with learning disabilities (Best, 1978; Ryan, Davidshofer and Miller, 1980; Wallace, 1978).

The computerized literature search previously detailed, revealed only two references related to students with nonvisible disabilities, excluding those with learning disabilities. Iwinski (1982), writing from the perspective of a service provider at a private university, discussed the characteristics of nonvisibly disabled students. She stated that nonvisible disabled students showed a tendency not to identify themselves as disabled, and not to use available support services until they encountered academic or personal difficulty. Typically, only a few students shared the same medical diagnosis and thus students with nonvisible disabilities lacked a group identity which made provision of services especially difficult.

LeBlanc (1982) discussed the problems of university students who are chronically ill and nonvisibly disabled. She stated that interpersonal relationships can pose problems for students who appear well, yet feel isolated from their peers because of an unseen disability. Having a chronic unstable condition that continually alters

bodily functions can make the acceptance of one's identity particularly difficult. LeBlanc also felt that many nonvisibly disabled students had difficulty separating from their family and developing their own value system. She stated that chronically ill students must prematurely accept the adult responsibility of accepting physical limitations at a time when their able bodied peers are feeling especially carefree and physically able, but there is often a developmental lag in other tasks crucial to establishing one's individual identity and value system-- vocational experiences, or social/sexual relationships.

Acceptance of Disability

In this study, acceptance of disability is defined as the ability to perceive a disability as nondevaluing. The disability may be inconvenient or limiting, but the individual still strives to improve whatever can be improved. This definition is based on the concept of loss developed by Dembo, Leviton and Wright (1956). Wright (1960) described acceptance of loss as a series of interdependent and progressive steps through which the individual experienced a series of value changes. She defined these changes as: 1) the enlargement of the scope of values; 2) the subordination of the physique; 3) the containment of disability effects; and 4) the transformation from comparative values to asset values.

Acceptance of disability is seen as a crucial variable in the rehabilitation process of disabled individuals (Wright, 1960; Safilios-Rothschild, 1971; Dembo et al., 1956). In reviewing a number of research studies, Shontz (1975) determined that it is the personal

meaning of disability to the individual that is of crucial importance in adjusting to that disability. Kir-Stimon (1977) reported that the critical variable in adjustment to disability is the significance to the individual of changes in relationships with others. He stated:

It is not the specific nature of the disease entity itself that is important, but the way in which it has changed or affected the patient's relationship to himself and his world . . . for the disabled, the question is clearly not one of being one's self but of being one's self in a world of animate existence among others who are functioning, developing, and being (Kir-Stimon, 1977, p. 363).

Starr and Heiserman (1977), in their study of acceptance of disability among teenagers with oral-facial clefts, supported the premise that a person's acceptance of disability is likely to be associated with better adjustment. Heinemann (1982) examined the process of adjustment following disability, using measures of acceptance of disability. He reported that persons coped initially with disability as they had with prior life disruption. Long term adjustment required the learning of additional coping strategies, with the most important element in adjustment being the ability to mourn.

A variety of factors have been shown to affect acceptance of disability. Woodrich (1982), with spinal cord injured vocational rehabilitation clients, Morrison (1979), with visually impaired persons, and Lovett (1982), who focused on assertiveness training, found a significant positive correlation between acceptance of disability and level of education. Woodrich (1982) additionally concluded that women tended to achieve higher levels of acceptance of disability than men, and that the duration of disability significantly affected the level of acceptance of disability.

Lovett (1982) and Morgan (1978) found a significant positive relationship between acceptance of disability and the level of assertiveness in disabled university students.

Bicknell (1978), in his study of disabled adolescents, found a positive correlation between the level of their acceptance of disability and their level of manifest anxiety. His results indicated that acceptance of disability is related to anxiety in a curvilinear fashion. It is a moderate level of anxiety, rather than a high or low level, which produces optimum acceptance of disability. Knowledge of disability was found to significantly correlate with acceptance of disability by Blue and Brillhart (1982). Their results also indicated that interpersonal support is not a factor in increasing acceptance of disability.

Self-Concept

The idea of self-concept is one which has led to much research, theory and debate. Few ideas have produced as many different views and as much disagreement as how to identify and define "self-concept."

One of the major contributors to the work done on self-concept has been Carl Rogers. According to Rogers (1951, p. 136), self-concept is defined as the:

Organized configuration of perceptions of the self which is admissible to awareness. It is composed of such elements as the perceptions of one's characteristics and abilities; the percepts and concepts of self in relation to others and to the environment; the value qualities which are perceived and associated with experiences and objects; and goals and ideas which are perceived as having positive or negative valence.

Rogers (1951, p. 497) further states:

As a result of interaction with the environment and particularly as a result of evaluational interaction with others, the structure of the self is formed . . . an organized, fluid, but consistent conceptual pattern of perceptions, or characteristics, and relationships.

This self-perception influences all individuals' perceptions of the world. In a climate conducive to self-exploration, self-concept can change (Rogers, 1961).

Wright (1980) defined self-concept as one's conception of one's various personal characteristics and attached values. Interactions with others are of great importance in developing the self-concept. While a healthy individual can incorporate new experiences (such as becoming disabled) into the existing self-concept, an individual who already has problems with self-concept will deny, distort or ignore experiences that are not consistent with the way the self is viewed.

According to Fitts (1972), the self-concept is a value predictor of many aspects of behavior and can be correlated with attitudes, feelings, and mental health. Further, with nondisabled persons, Fitts has stated that the self-concept is positively correlated with successful performance of some task, such as work or school.

The use of the self-concept as an evaluative measure of development is supported by Fitts (1965, 1972), who stated that knowledge of how individuals perceive themselves is useful in attempting to help those individuals.

A number of research studies have been conducted using the self-concept as an evaluation criterion. In studies of the physically disabled and self-concept, the disability appeared to have a negative effect in some cases.

Shelsky (1957) found that the self-concept of tuberculosis patients was more negatively affected by disability than the self-concept of amputees or the acutely ill, although all three groups showed lowered self-concept.

Safilios-Rothschild (1971) stated that a person's body image, including physical appearance, bodily sensations, beliefs, and emotions about the body, made up part of the self-concept. She theorized that the age at onset of disability was a major factor in self-concept, since the longer a disability is present, the more likely it is to be integrated into the self-concept.

Flatley (1973), using disabled subjects in a residential setting, found that those subjects in a training program had a more positive self-concept than those subjects who were not in training. Further, the longer the period in training, the more positive the self-concept.

Acceptance of Disability and Self-Concept

Research has indicated a relationship between acceptance of disability and self-concept (Linkowski and Dunn, 1974). Linkowski and Dunn examined acceptance of disability and its relationship to two aspects of self-concept: self-esteem and satisfaction with social relationships. Their conclusion was that acceptance of disability was

a central aspect of self-concept, relating to both satisfaction with social relationships and self-esteem.

Safilios-Rothschild (1971) discussed how changes in social relationships due to disability will affect a person's concept of self. She stated:

Whenever a person's appearance is changed as a result of disability, the mode of interpersonal relations will also be greatly influenced. These marked changes in the interaction process will finally affect the individual's self-perception, although the extent and depth of such an effect will depend greatly upon his willingness to perceive these changes and interpret them as significant (Safilios-Rothschild, 1971, p. 96).

A person's body image, including physical appearance, bodily sensations, beliefs and emotions about the body, make up part of self-concept (Safilios-Rothschild, 1971). Both Shibutani (1961) and MacGregor (1951) concluded that the importance of body image within self-concept varies according to the nature and intensity of emotions and values invested in it.

MacGregor and Abel (1953) concluded that persons with facial disfigurements who had adequately incorporated their disability into their self-concept were satisfied with improvement gained through plastic surgery, while those who had never accepted their disability and had not integrated it into their self-concept were dissatisfied.

Wright (1960) indicated that nondisabled persons have both positive and negative attitudes towards disabled persons. Positive attitudes seem to occur more readily when the disabled person has accepted the disability and therefore concludes that others can accept it also. She stated: "Expectations concerning the attitudes

of others towards oneself are crucial in the perception of those attitudes . . . the self-concept is crucial in determining those expectations (Wright, 1960, p. 178).

Wissel (1981) studied acceptance of disability and self-concept with spinal cord injured persons, using as a definition of acceptance of disability the ability of the individual to incorporate within the self-concept an awareness and understanding of the implications of serious injury (Linkowski and Dunn, 1974; Wright, 1960). A significant relationship was found between acceptance of disability and self-concept for quadriplegics but not for paraplegics.

Patrick (1984) compared ten novice and twelve veteran wheelchair athletes on measures of self-concept, using the Tennessee Self-Concept scale (Fitts, 1965), and acceptance of disability, using the Acceptance of Disability scale (Linkowski, 1971). Significant differences were found between the two groups on acceptance of disability, perceived social adequacy, and consistency of self-perception. Novice disabled athletes had lower self-concept scores than veteran athletes, and their acceptance of disability scores were significantly lower as well.

Summary

This chapter contains a review of the available literature in the areas of nonvisible and visible disability, physically disabled university students, acceptance of disability, and self-concept.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter presents the specific methods of the study. It discusses study subjects, variables, procedures and design, research instrumentation, and statistical analysis.

Description of the Subjects

Eighty physically disabled university students were included in the study. All students were enrolled during the spring semester, 1984, at The University of Arizona, Tucson, or at Arizona State University, Tempe. All subjects were volunteers, and were obtained through contact with either the Disabled Students' services program or the Student Health service at each institution.

Forty-two of the students had a visible disability. Criteria for their participation in the study included current enrollment in a university-level academic program, and a physical disability in which the medical condition was apparent, without difficulty, by casual observation. Visibly disabled students were selected personally by the study investigator.

Thirty-eight of the study participants had nonvisible disabilities. Subjects in this group were required to be currently enrolled in a university-level academic program, and have a physical disability which was "unapparent or not readily apparent by casual

acquaintance" (Falvo et al., 1982, p. 2). For purposes of validity, students with nonvisible disabilities were required to have a medical doctor verify their individual diagnosis.

Description of the Procedure

All interviewing and testing of the subjects was performed personally by the study investigator. She also provided assistance with reading and writing if students were unable to complete study instruments alone.

All subjects were required to read an informed consent statement and sign a release form. A copy of this form was provided to each student upon request. The original forms were filed with the Human Subjects Committee (see Appendix A).

Subjects were then interviewed and tested by the study investigator, who provided assistance with reading and writing if students were unable to complete the study instruments alone. The three instruments used were the Subject Information Sheet (Appendix B), to provide basic demographic information, the Acceptance of Disability scale (Appendix C), to assess the level of the student's acceptance of disability, and the Tennessee Self-Concept scale (Appendix D), to measure self-esteem.

The Acceptance of Disability scale was scored by the method described by Linkowski (1971). The Tennessee Self-Concept scale was scored according to instructions provided by Fitts (1965).

All questionnaires and answer sheets were number coded to protect the anonymity of study participants during the scoring

process. Names of subjects were not retained. Items of information on the questionnaires and answer sheets were coded and recorded on data sheets; cards for computer analysis were punched directly from the data sheets.

Variables

The dependent variables used in the study were: 1) acceptance of disability, as measured by the Acceptance of Disability scale (AD); and 2) self-concept, as measured by nine subscales of the Tennessee Self-Concept scale (TSCS).

The independent variables used in the study were: 1) disability type (visible or nonvisible); 2) the number of incorrect medical diagnoses; 3) the length of time between the first appearance of physical symptoms and medical diagnosis; and 4) the length of time between medical diagnosis and the present.

Design

Because the instruments used in the study were surveys, the research design selected for use in this study was a two group correlational study. Correlational procedures are commonly used in connection with surveys. When a survey is used, variables are not manipulated, but measures are taken of several variables, and correlations are computed to determine whether or not they are related (Craig and Metze, 1979). Computing correlations determines if changes in one variable are accompanied by changes in another variable.

Description of Research Instrumentation

The Acceptance of Disability Scale

The Acceptance of Disability scale (AD), developed by Linkowski (1971), is a questionnaire containing 50 statements that reflect values and attitudes within the four areas of acceptance of loss based on the concept of loss developed by Dembo et al. (1956). Using the same six-point response continuum as the Attitudes Towards Disabled Scale (Yuker, Block and Campbell, 1960), the subject indicates the degree of agreement or disagreement with each of the 50 items. The reliability of the AD scale is indicated by a split-half coefficient of 0.93 obtained for 46 clients at a rehabilitation hospital.

The Tennessee Self-Concept Scale

The Tennessee Self-Concept scale, developed by Fitts (1965), consists of 100 descriptive statements which the subjects use to portray their own image of themselves. This study used the counseling form of the test, since the author indicated that this form is appropriate for self-interpretation and feedback to counselees (Fitts, 1965). In interpreting the Tennessee Self-Concept scale, the total positive score was used in addition to eight subscores: physical self, moral-ethical self, personal self, family self, social self, identity, self-acceptance and behavior.

The Tennessee Self-Concept scale has been normed using college students as part of the norming group. Test-retest reliability for the total positive score for that population was 0.92 (Fitts, 1965).

Validity of the Tennessee Self-Concept scale is reported to be good, although there is virtually a complete absence of information regarding the internal consistency of the scale or on any of the scale subscores. Bentler (1972, p.366), however, feels that the "internal consistency coefficients would doubtless be quite high, considering the large correlations obtained between scale scores and other measures such as the Minnesota Multiphasic Personality Inventory." Suinn (1972, p.367) stated that the Tennessee Self-Concept scale "ranks among the better measures combining group discrimination with self-concept information."

Statistical Procedures

The data was analyzed using the CROSS TABS, ANOVA, T-TEST, PEARSON CORR, AND MULTIPLE R subprograms of the Statistical Package for the Social Sciences Program (Nie et al., 1975). Multiple regression analysis, in which predictor equations were established for each of the two dependent variables (acceptance of disability and self-concept) as a function of the four independent variables (disability type-visible or nonvisible, the number of incorrect medical diagnoses, the length of time between the first appearance of physical symptoms and medical diagnosis, and the length of time between medical diagnosis and the present) were used. The specific stepwise multiple regressions derived were:

- 1) The relationship of total self-concept with disability type, the length of time between the first appearance of physical symptoms and

medical diagnosis, and the length of time between medical diagnosis and the present; and

2) The relationship of acceptance of disability with self-concept, disability type, the length of time between the first appearance of physical symptoms and medical diagnosis, and the length of time between medical diagnosis and the present.

A detailed explanation of multiple regression procedures may be found in Pedhazur (1982).

It was hypothesized that relationships existed between specific demographic variables and variables relating to disability type, acceptance of disability, self-concept, the number of incorrect medical diagnoses, the length of time between the first appearance of physical symptoms and medical diagnosis, and the length of time between medical diagnosis and the present. These relationships were examined using Pearson product-moment correlations, analysis of variance, and t-tests.

Summary

Chapter 3 included a description of the study subjects and procedures, a listing of the variables, a discussion of the research design and instrumentation, and a presentation of methods of data analysis.

CHAPTER 4

RESULTS

The results of the study are reported in this chapter. The hypotheses are restated and the analyses of the data are presented.

Testing the Hypotheses

Hypothesis 1

There is no significant relationship between disability type and self-concept as measured by nine subscales of the Tennessee Self-Concept scale (TSCS).

Self-concept scores were divided into nine categories: the eight subgroups of the Tennessee Self-Concept scale (TSCS1-identity, TSCS2-self-satisfaction, TSCS3-behavior, TSCS4-physical self, TSCS5-moral-ethical self, TSCS6-personal self, TSCS7-family self, and TSCS8-social self), and the total positive score of the TSCS (TENNTOT). Nine two-way analyses of variance were conducted using the self-concept scores, disability type (visible and nonvisible), and severity (mild, moderate and severe). The results are presented in Table 1. As the analyses showed no statistically significant differences between groups for the self-concept measures, the null hypothesis was not rejected.

Table 1. Analysis of variance summaries of self-concept measures for disability type and severity (N=80)

Source of Variation		df	SS	MS	F	p
TSCS1:	Visible (A)	1	204.293	204.293	1.312	ns
	Severity (B)	2	123.566	61.783	.397	ns
	A X B	2	292.945	146.472	.941	ns
	Error	74	11521.805	155.700		
TSCS2:	Visible (A)	1	227.484	227.484	.917	ns
	Severity (B)	2	227.187	113.594	.458	ns
	A X B	2	619.820	309.910	1.249	ns
	Error	74	18355.108	248.042		
TSCS3:	Visible (A)	1	15.091	15.091	.091	ns
	Severity (B)	2	96.325	48.163	.289	ns
	A X B	2	373.423	186.712	1.122	ns
	Error	74	12312.498	166.385		
TSCS4:	Visible (A)	1	1.237	1.237	.017	ns
	Severity (B)	2	7.614	3.802	.051	ns
	A X B	2	56.674	28.337	.378	
	Error	74	5542.183	74.894		
TSCS5:	Visible (A)	1	15.300	15.300	.132	ns
	Severity (B)	2	71.892	35.946	.311	ns
	A X B	2	243.224	121.612	1.051	ns
	Error	74	8563.183			
TSCS6:	Visible (A)	1	17.342	17.342	.143	ns
	Severity (B)	2	453.178	226.589	1.872	ns
	A X B	2	569.094	284.547	2.351	ns
	Error	74	8956.449	121.033		
TSCS7:	Visible (A)	1	51.574	51.574	.367	ns
	Severity (B)	2	300.706	150.352	1.071	ns
	A X B	2	234.408	117.204	.835	ns
	Error	74	10388.625	140.387		
TSCS8:	Visible (A)	1	79.710	79.710	.604	ns
	Severity (B)	2	220.656	110.328	.836	ns
	A X B	2	337.815	168.907	1.280	ns
	Error	74	9765.924	131.972		
TENNTOT:	Visible (A)	1	9.581	9.581	.008	ns
	Severity (B)	2	992.173	496.087	.398	ns
	A X B	2	3214.673	1607.337	1.289	ns
	Error	74	92288.992	1247.149		

An examination of the cell means did indicate, however, that there was a substantial difference between visibly and nonvisibly disabled subjects with reference to severity of disability and self-concept. Nonvisibly disabled subjects had increasingly more positive self-concept scores as the severity of their disability increased, while visibly disabled subjects had less positive self-concept scores as their severity rating increased. The greatest difference was between subjects reporting mild levels of disability, regardless of disability type. Figure 1 presents the cell means and interaction graphs of the analyses of variance conducted showing this trend.

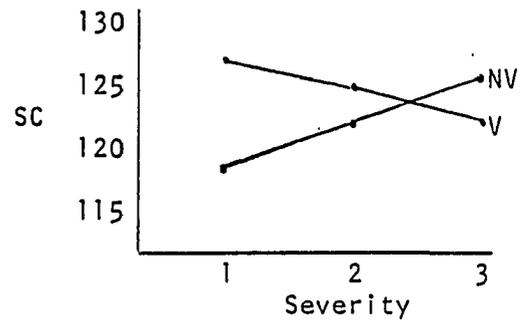
Hypothesis 2

There is no significant relationship between disability type and acceptance of disability as measured by the Acceptance of Disability scale (AD).

A two-way analysis of variance was conducted using the total acceptance of disability score (TOTAD), disability type, and severity rating. The results are presented in Table 2. As the analysis showed no significant difference between groups for the acceptance of disability measure, the null hypothesis was not rejected.

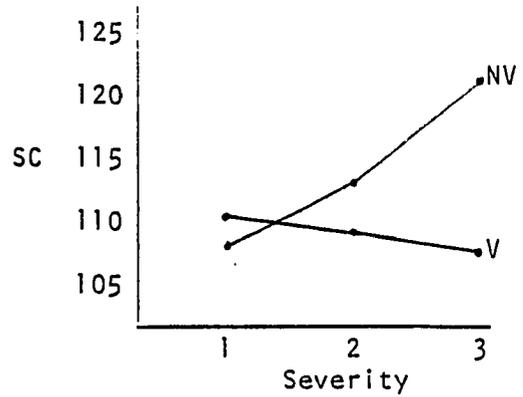
TSCS1

	Severity		
	Mild	Moderate	Severe
NV	118.42 (19)	123.57 (14)	125.80 (5)
V	127.57 (7)	126.00 (22)	123.54 (13)



TSCS2

	Severity		
	Mild	Moderate	Severe
NV	108.05 (19)	113.00 (14)	121.80 (5)
V	111.00 (7)	109.86 (22)	107.69 (13)



TSCS3

	Severity		
	Mild	Moderate	Severe
NV	109.26 (19)	115.36 (14)	112.00 (5)
V	117.29 (7)	112.77 (22)	111.23 (13)

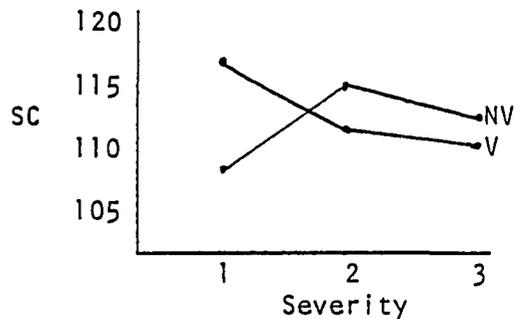
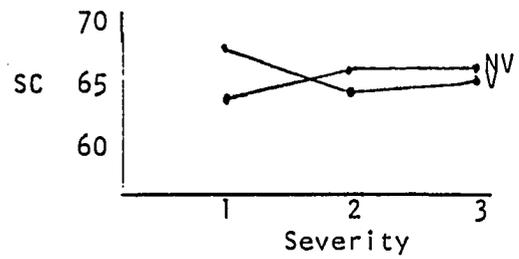


Figure 1. Analyses of variance cell means and interaction graphs of self-concept measures for disability type and severity (N=80)

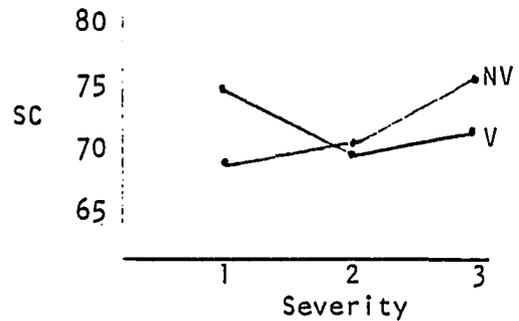
TSCS4

	Severity		
	Mild	Moderate	Severe
NV	64.53 (19)	66.14 (14)	66.40 (5)
V	67.00 (7)	64.45 (22)	65.62 (13)



TSCS5

	Severity		
	Mild	Moderate	Severe
NV	69.16 (19)	71.86 (14)	76.00 (5)
V	75.71 (7)	71.14 (22)	72.92 (13)



TSCS6

	Severity		
	Mild	Moderate	Severe
NV	61.68 (19)	70.50 (14)	74.40 (5)
V	70.86 (7)	69.77 (22)	64.92 (13)

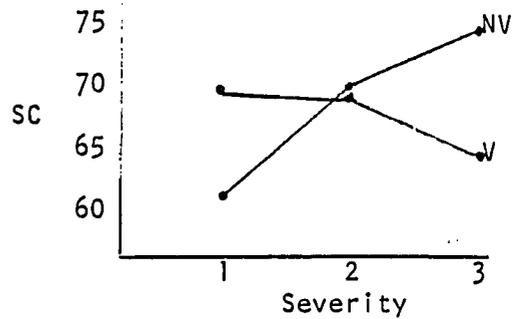
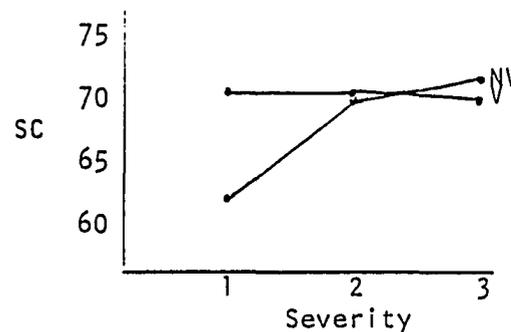


Figure 1. Analyses of variance cell means and interaction graphs of self-concept measures for disability type and severity (N=80)

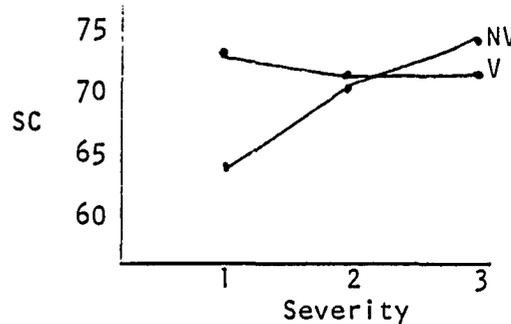
TSCS7

	Severity		
	Mild	Moderate	Severe
NV	63.95 (19)	70.43 (14)	73.40 (5)
V	71.00 (7)	70.91 (22)	70.54 (13)



TSCS8

	Severity		
	Mild	Moderate	Severe
NV	64.47 (19)	70.64 (14)	74.40 (5)
V	73.00 (7)	71.32 (22)	71.00 (13)



TENNTOT

	Severity		
	Mild	Moderate	Severe
NV	335.74 (19)	351.93 (14)	359.60 (5)
V	355.86 (7)	348.64 (22)	342.46 (13)

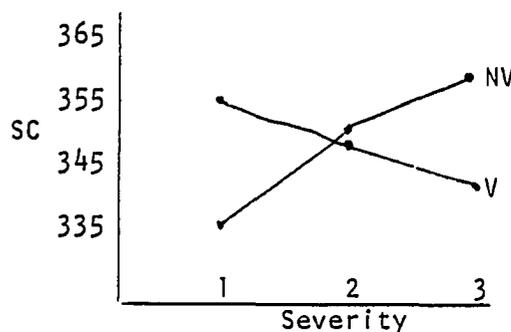


Figure 1. Analyses of variance cell means and interaction graphs of self-concept measures for disability type and severity (N=80)

Table 2. Analysis of variance summary of acceptance of disability measures for disability type and severity rating (N=80)

Source of Variation	df	SS	MS	F	p
TOTAD: Visible (A)	1	6.845	6.845	.007	ns
Severity (B)	2	4066.361	2033.181	2.219	ns
A X B	2	2228.297	1114.149	1.216	ns
Error	74	67799.897	916.215		

Hypothesis 3

There is no significant relationship between self-concept as measured by nine subscales of the TSCS and the length of time between the first appearance of physical symptoms and medical diagnosis (TSD).

The relationships among nine self-concept measures (TSCS1, TSCS2, TSCS3, TSCS4, TSCS5, TSCS6, TSCS7, TSCS8, and TENNTOT) and the time between the first appearance of physical symptoms and medical diagnosis were for the most part not statistically significant. Of the nine correlations reported, two were significant at the .01 and .05 levels using the Pearson product-moment correlation coefficient. The results are shown in Table 3. Both $-.2255$ ($r_{TSCS1, TSD}$) and $-.2674$ ($r_{TSCS7, TSD}$) showed moderate relationships. These relationships were negative indicating that students who had a shorter length of time between the first appearance of physical symptoms and medical diagnosis had a higher self-concept with reference to family self and identity.

The null hypothesis was not rejected in seven of nine cases; it was rejected for the two of nine correlations which were statistically significant.

Table 3. Pearson product-moment correlations between self-concept measures, and the length of time between the first appearance of physical symptoms and medical diagnosis (N=80)

Self-Concept Measures	TSD
TSCS1	-.2255 p = .022**
TSCS2	-.0000 p = .500
TSCS3	-.0782 p = .245
TSCS4	.0125 p = .456
TSCS5	-.1132 p = .159
TSCS6	-.0670 p = .277
TSCS7	-.2674 p = .008*
TSCS8	-.067 p = .281
TENNTOT	-.1089 p = .168

*p <.01
**p <.05

Hypothesis 4

There is no significant relationship between self-concept as measured by nine subscales of the TSCS and the length of time between medical diagnosis and the present.

The relationships among nine self-concept measures (TSCS1, TSCS2, TSCS3, TSCS4, TSCS5, TSCS6, TSCS7, TSCS8, and TENNTOT), and the length of time between medical diagnosis and the present were not statistically significant. The results of the Pearson product-moment correlations conducted with these variables are shown in Table 4. Since none of the nine correlations were significant, the null hypothesis was not rejected.

Hypothesis 5

There is no significant relationship between acceptance of disability and the length of time between the first appearance of physical symptoms and medical diagnosis.

The relationship between acceptance of disability, using the total acceptance of disability score (TOTAD), and the length of time between the first appearance of physical symptoms and medical diagnosis (TSD) was significant at the .05 level using the Pearson product-moment correlation coefficient. The relationship of $-.2195$ ($r_{TOTAD, TSD}$) was negative, indicating that students had greater levels of acceptance of disability when the length of time between the onset of symptoms and diagnosis was short. The results are presented in Table 5. Since statistically significant results were obtained, the null hypothesis was rejected.

Table 4. Pearson product-moment correlations between self-concept measures and the length of time between medical diagnosis and the present (N=80)

Self-Concept Measures	TDP
TSCS1	.0265 p = .408
TSCS2	-.1002 p = .188
TSCS3	-.0362 p = .375
TSCS4	-.0459 p = .343
TSCS5	.0404 p = .361
TSCS6	-.0178 p = .438
TSCS7	.0724 p = .262
TSCS8	-.0335 p = .384
TENNTOT	-.0485 p = .335

Table 5. Pearson product-moment correlation between acceptance of disability (TOTAD) and the length of time between the first appearance of physical symptoms and medical diagnosis (TSD) (N=80)

	TOTAD
TSD	-.2195 p = .025*

*p < .05

Hypothesis 6

There is no significant relationship between acceptance of disability, using the total acceptance of disability score (TOTAD), and the length of time between medical diagnosis and the present (TDP).

The relationship between TOTAD and TDP was not statistically significant using the Pearson product-moment correlation coefficient. Therefore, the null hypothesis was not rejected. The results are reported in Table 6.

Table 6. Pearson product-moment correlation between acceptance of disability and the length of time between medical diagnosis and the present (N=80)

	TOTAD
TDP	.0645 p = .285

Hypothesis 7

There is no significant relationship between disability type and the number of incorrect medical diagnoses.

The null hypothesis was not rejected. A critical value of 1.99 would be needed to reject the null hypothesis at the .05 level of significance. A t-test was conducted in which a t-value of 1.85 was obtained. The statistical analysis is presented in Table 7. Although no statistically significant difference was found, the nonvisible group

received four times as many incorrect medical diagnoses as the visible group.

Table 7. T-test for analysis of disability type and the number of incorrect medical diagnoses (N=80)

Variable	# Cases	Mean	SD	t	p
Number Incorrect Medical Diagnoses					
NV	38	2.6579	6.799	1.85	ns
V	42	.6429	1.792		

Other variables were examined to determine if relationships existed with the number of incorrect medical diagnoses. A t-test was performed to determine if sex and the number of incorrect diagnoses were significantly related. Although women received more incorrect diagnoses than men, the difference was not statistically significant. Results are presented in Table 8.

Table 8. T-test for analysis of sex and the number of incorrect medical diagnoses (N=80)

Variable	# Cases	Mean	SD	t	p
Number Incorrect Medical Diagnoses					
F	33	1.4242	5.443		
M	47	1.7234	4.600	-.270	ns

The relationships among nine self-concept measures (TSCS1, TSCS2, TSCS3, TSCS4, TSCS5, TSCS6, TSCS7, TSCS8, and TENNTOT), and the number of incorrect medical diagnoses were investigated via Pearson product-moment correlations. Of the nine correlations reported, four were significant at the .01, .05 and .10 levels, including TENNTOT. The results are shown in Table 9.

The four correlations $-.4083 (r_{TSCS1 \#ID})$, $-.2632 (r_{TSCS2 \#ID})$, $-.4592 (r_{TSCS6 \#ID})$, and $-.2732 (r_{TENNTOT \#ID})$ were negative, indicating that students with fewer incorrect medical diagnoses had higher self-concept scores in the areas of identity, self-satisfaction, personal self, and total self-concept. Self-concept and the number of incorrect medical diagnoses can be said to have a significant relationship in relation to these four measures.

The relationship between acceptance of disability, using the total acceptance of disability score (TOTAD) and the number of incorrect medical diagnoses was significant at the .05 level using the Pearson product-moment correlation coefficient. $-.3418 (r_{TOTAD, \#ID})$ is a negative relationship indicating that students had a higher level of acceptance of disability if they received fewer incorrect medical diagnoses. The results are presented in Table 10.

Table 9. Pearson product-moment correlations between self-concept and the number of incorrect medical diagnoses (N=80)

Self-Concept Measures	Number of Incorrect Diagnoses
TSCS1	-.4083 p = .019**
TSCS2	-.2632 p = .097***
TSCS3	-.0898 p = .331
TSCS4	-.0193 p = .463
TSCS5	-.1802 p = .189
TSCS6	-.4592 p = .009*
TSCS7	-.1835 p = .185
TSCS8	-.1326 p = .259
TENNTOT	-.2732 p = .088***

*p < .01
 **p < .05
 ***p < .10

Table 10. Pearson product-moment correlation between acceptance of disability and the number of incorrect medical diagnoses (N=80)

	TOTAD
#ID	- .3418 (26) p = .044*

*p < .05 .

The above analyses for hypothesis 7 were conducted using the study total N of 80 subjects. However, it was noted that while all but four of the subjects reported between one and five incorrect medical diagnoses, four subjects indicated either 10 diagnoses (n=2) or 30 diagnoses (n=2). Therefore, it was decided to conduct the analyses a second time, using an N of 76 subjects. For discussion of this problem, see chapter 5.

Hypothesis 7

There is no significant relationship between disability type and the number of incorrect medical diagnoses.

The null hypothesis was not rejected. A critical value of 1.97 would be needed to reject the null hypothesis at the .05 level of significance. A t-test was conducted in which a t-value of 1.82 was obtained. The statistical analysis is presented in Table 11. Although no statistically significant difference was found, it was noted that the nonvisible group received twice as many incorrect medical diagnoses as the visible group.

Table 11. T-test for analysis of disability type and the number of incorrect medical diagnoses (N=76)

Variable	# Cases	Mean	SD	t	p
Number Incorrect Medical Diagnoses					
NV	35	.8857	1.231	1.282	ns
V	41	.4146	1.024		

Other variables were examined to determine if relationships existed with the number of incorrect medical diagnoses. A t-test was performed to determine if sex and the number of incorrect medical diagnoses were significantly related. Women again received more incorrect medical diagnoses than men, but the results were not statistically significant. The analysis is presented in Table 12.

Table 12. T-test for analysis of sex and the number of incorrect medical diagnoses (N=76)

Variable	# Cases	Mean	SD	t	p
Number Incorrect Medical Diagnoses					
M	31	.2258	.669	-2.68	ns
F	45	.9111	1.311		

The relationships among nine self-concept measures (TSCS1, TSCS2, TSCS3, TSCS4, TSCS5, TSCS6, TSCS7, TSCS8, and TENNTOT), and the number of incorrect medical diagnoses were investigated via Pearson product-moment correlations. None of the nine correlations reported were statistically significant any any level, indicating the lack of a significant relationship between self-concept measures and the number of incorrect medical diagnoses. These results are presented in Table 13.

The relationship between acceptance of disability, using the total acceptance of disability score (TOTAD) and the number of incorrect medical diagnoses was investigated using the Pearson product-moment correlation coefficient. The analysis determined that no statistically significant relationship existed between the two variables. Results are shown in Table 14.

Other Findings

Other findings of interest in this investigation involved the predictive ability of the study variables. Stepwise multiple regressions were carried out for the criterion variables, Acceptance of Disability and Self-Concept using Disability Type, the number of incorrect medical diagnoses, the length of time between the first appearance of physical symptoms and medical diagnosis and the length of time between medical diagnosis and the present as predictor variables. The results showed that acceptance of disability was significantly predicted by self-concept, which accounted for 36% of the variance. The other variables failed to account for more than an

Table 13. Pearson product-moment correlations between self-concept and the number of incorrect medical diagnoses (N=76)

Self-Concept Measures	Number of Incorrect Diagnoses
TSCS1	.0205 p = .464
TSCS2	-.1042 p = .322
TSCS3	-.1125 p = .309
TSCS4	.1292 p = .283
TSCS5	-.1239 p = .291
TSCS6	-.1970 p = .190
TSCS7	-.1565 p = .243
TSCS8	-.0048 p = .491
TENNTOT	-.0806 p = .361

Table 14. Pearson product-moment correlations between acceptance of disability and the number of incorrect medical diagnoses (N=76)

	TOTAD
Number Incorrect Diagnoses	.0821 (22) p = .358

additional 16% of the variance. Thus, acceptance of disability was not significantly predicted by disability type, the number of incorrect medical diagnoses, the length of time between the first appearance of physical symptoms and medical diagnosis, and the length of time between medical diagnosis and the present. The results are shown in Table 15.

Table 15. Summary table for multiple regression analysis for acceptance of disability (TOTAD) as a criterion variable

Step	Variable	F	Sig.	Mul. R	R Sq.	Simple R
1	TENNTOT	45.17575	.000	.60561	.36676	.60561
2	TSD	3.01464	.087	.62499	.39062	-.21948
3	DT	2.05400	.156	.63769	.40665	-.05128
4	TDP	.84482	.361	.64285	.41326	.06453
5	#10xs	.22891	.634	.64426	.41507	-.20415

Regression analyses showed that self-concept was not significantly predicted by Acceptance of Disability, or any of the predictor variables used (DT, TSD, TDP, and the number of incorrect medical diagnoses). A summary table of these results is presented in Table 16.

Table 16. Summary table of regression analysis for self-concept as a criterion variable (N=80)

Step	Variable	F	Sig.	Mul. R	R Sq.	Simple R
1	TSD	.93563	.336	.10887	.01185	-.10887
2	TDP	.50001	.482	.13501	.01823	-.04851
3	#IDxs	.08759	.768	.13913	.00113	-.10716
4	DT	.07001	.792	.14238	.00091	.04434

Preliminary data analysis showed that subjects in the non-visible group had higher grade point averages than subjects in the visible group. A t-test of means was conducted to determine if a significant difference between groups existed. The results, which are presented in Table 17, show a difference between groups that is significant at the .05 level.

Table 17. Results of the t-test of means for disability type and grade point average (N=80)

Variable	# Cases	Mean	SD	t	p
GPA					
NV	38	3.1405	.643		
V	42	2.7979	.546	2.58	.012*

*p <.05

Summary

This chapter reported the statistical analyses and findings of each research hypothesis.

It was found that disability type, as defined and measured in this study, did not have a statistically significant effect on the acceptance of disability of physically disabled university students. Neither did self-concept appear to be significantly affected by disability type, although a trend was noted whereby nonvisibly disabled students had increasing self-concept scores as their disability increased in severity, while visibly disabled students had the opposite effect.

The length of time between the first appearance of physical symptoms and diagnosis did not significantly affect self-concept, but did have a significant impact on acceptance of disability. No statistically significant relationship was found between either self-concept or acceptance of disability and the length of time between medical diagnosis and the present.

The relationship between the number of incorrect medical diagnoses and a number of variables was investigated, using an N of both 80 and 76 subjects. Analyses on 80 subjects showed no significant relationship between the number of incorrect medical diagnoses and disability type, sex, and five measures of self-concept. A significant relationship was found, however, between acceptance of disability and the number of incorrect medical diagnoses. Also, the number of incorrect medical diagnoses had a significant impact on the self-concept

measures of identity, self-satisfaction, personal self, and total self-concept scores.

Analyses on 76 subjects determined that there was no significant relationship between the number of incorrect medical diagnoses and disability type, sex, acceptance of disability, and self-concept.

Trends were noted for both 80 and 76 subject groups indicating that nonvisibly disabled students consistently received a greater number of incorrect diagnoses than did visibly disabled students, and that women received more incorrect medical diagnoses than did men.

Finally, regression analysis showed that acceptance of disability could be significantly predicted by self-concept.

CHAPTER 5

SUMMARY, CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

This chapter contains a summary of the study, a discussion of the study findings, conclusions based on the results obtained from the data, and recommendations.

General Summary

This study was concerned with the effect of visible and non-visible disabilities on the self-concept and acceptance of disability of physically disabled university students. The study also attempted to determine the degree of the relationship between disability type and acceptance of disability, self-concept, the number of incorrect medical diagnoses, the length of time between the first appearance of physical symptoms and medical diagnosis, and the length of time between medical diagnosis and the present.

The subjects in the study were 80 physically disabled students enrolled at either The University of Arizona (n=63) or Arizona State University (n=17) during the spring semester, 1984. Volunteers were divided into two groups: students with visible disabilities (n=42) and students with nonvisible disabilities (n=38). There were 33 females and 47 males in the study (see Appendix E).

All subjects read and signed an informed consent and release form. They also completed the Subject Information Sheet, the Acceptance

of Disability scale, and the Tennessee Self-Concept scale. Additionally, students in the nonvisibly disabled group signed a medical diagnosis verification form which was sent to individual physicians for confirmation of medical diagnoses.

The major statistical analyses used were t-tests, analysis of variance, and Pearson product-moment correlations. T-tests of the means were used to examine relationships between disability type and the number of incorrect medical diagnoses, sex and the number of incorrect medical diagnoses, and disability type and grade point average. Pearson product-moment correlations examined the relationships between self-concept and time between onset of symptoms and diagnosis, time between diagnosis and the present, and number of incorrect diagnoses; and between acceptance of disability and time between onset of symptoms and diagnosis, time between diagnosis and the present, and number of incorrect diagnoses. The relationships between disability type, severity, self-concept and acceptance of disability were analyzed by the analysis of variance procedure. Finally, multiple regression analysis was utilized with predictor equations that were established for the dependent variables as a function of the independent variables.

Results of the investigation showed that disability type did not significantly influence either self-concept or acceptance of disability. No significant relationship between self-concept and either the length of time between the first appearance of physical symptoms and diagnosis or the length of time between medical diagnosis and the present was found. While no significant relationship was indicated between acceptance of disability and the length of time between medical

diagnosis and the present, the length of time between the first appearance of physical symptoms and medical diagnosis did show a statistically significant effect on acceptance of disability.

No significant relationship was found between the number of incorrect medical diagnoses and disability type, or between the number of incorrect medical diagnoses and sex.

Using the scores of 80 subjects (the study's total N), a significant relationship was found between the number of incorrect medical diagnoses and acceptance of disability. A significant relationship was found between the number of incorrect medical diagnoses and self-concept on four of nine measures: identity, self-satisfaction, personal self, and total self-concept score. Using the scores of 76 subjects (four were discarded because of their extreme nature), no significant relationship was found between the number of incorrect medical diagnoses and either self-concept or acceptance of disability.

Acceptance of disability was found to be predicted by total self-concept. This finding supports earlier research (Linkowski and Dunn, 1974) which concluded that acceptance of disability may be viewed indirectly as a measure of self-esteem, one aspect of mental health of disabled individuals. Wissel (1981) found a significant relationship between acceptance of disability and self-concept for quadriplegics.

Some limitations should be considered when interpreting these data. The sample consisted of university students at The University of Arizona, Tucson, and Arizona State University, Tempe. Educational status of the subjects may have influenced the results, since physically disabled college students have been found to have higher scores

on the Acceptance of Disability scale as compared with other physically disabled individuals (Linkowski, 1971). Additionally, students with learning disabilities were excluded from this study. Since this group comprises an ever increasing portion of the disabled student population, the results of this study may not be truly representative.

Conclusions

The following conclusions can be drawn from the results of this investigation:

- 1) Disability type, as defined and measured in this study, does not appear to have a statistically significant effect on the self-concept and acceptance of disability of physically disabled university students, as measured by the Tennessee Self-Concept scale (Fitts, 1965) and the Acceptance of Disability scale (Linkowski, 1971).
- 2) The length of time between medical diagnosis and the present, as defined and measured in this study, does not appear to have a statistically significant effect on either measured self-concept or acceptance of disability.
- 3) The length of time between the first appearance of physical symptoms and medical diagnosis, as defined and measured in this study, does not appear to have a statistically significant effect on self-concept, but does have a statistically significant effect on acceptance of disability.
- 4) The number of incorrect medical diagnoses did not correlate significantly with disability type, sex, or self-concept.

Using 80 subjects, however, the number of incorrect medical diagnoses did have a statistically significant effect on acceptance of disability.

- 5) Acceptance of disability can be predicted from overall self-concept.

Discussion

Results of the study indicated that disability type had no statistically significant effect on either self-concept or acceptance of disability. The analysis of disability type, self-concept, and level of severity of disability revealed an interesting trend, however. Nonvisibly disabled subjects reported higher self-concept scores as the severity of disability increased, while visibly disabled subjects reported decreasing self-concept scores as the severity of disability increased. Evidently, severity, as an issue, needs to be considered when discussing disability type and self-concept, even though no statistically significant results were obtained in this particular study.

One possible explanation for this trend might be the characteristics of nonvisible disability of delayed diagnosis and lack of medical validation for symptoms, as detailed by Falvo et al. (1982). Perhaps some nonvisibly disabled individuals felt unsupported and not taken seriously when their disability was classified as "mild"; by the time the disability became severe, these individuals had the benefit of a confirmed medical diagnosis, appropriate treatment, and a support network to help them deal with their condition.

Findings in this study indicated that the length of time between medical diagnosis and the present was not significantly related to either self-concept or acceptance of disability. This result is not consistent with the work of Susman et al. (1982), who concluded from their study with pediatric cancer patients, that acceptance is positively correlated to length of time elapsed since diagnosis. Kellerman et al. (1980) determined that anxiety was correlated negatively with time since diagnosis, indicating increased coping skills and higher levels of acceptance of disability.

The length of time between the first appearance of physical symptoms and medical diagnosis was found to be significantly related to acceptance of disability: the shorter the length of time between the appearance of symptoms and diagnosis, the higher the level of acceptance of disability. This finding might be explained by the fact that few individuals would view themselves as disabled without a medical diagnosis, and the sooner the diagnosis is obtained the sooner it is possible to begin the process of adjusting to new functional abilities and living skills.

The length of time between the first appearance of physical symptoms and medical diagnosis did not relate significantly to overall self-concept. This is somewhat interesting, in view of the fact that earlier research by Linkowski and Dunn (1974) concluded that acceptance of disability was part of self-concept in general. Further, other findings in this study determined that acceptance of disability could be predicted from overall self-concept scores.

The number of incorrect medical diagnoses was not found to relate significantly to disability type or sex, although two distinct trends were noted. Nonvisibly disabled subjects reported more incorrect diagnoses than did visibly disabled subjects, and women reported substantially more incorrect diagnoses than did men. While some might conclude from this evidence that women received prejudicial treatment in their interactions with predominantly male physicians, the explanation may in fact have more to do with the nature of the disease entities reported by nonvisibly disabled subjects. For example, rheumatoid arthritis affects three times more women than men, as does systemic lupus erythematosus. In the early stages, both of these diseases can be very difficult to diagnose absolutely (Lorig and Fries, 1980). Both rheumatoid arthritis and lupus are common examples of medical conditions that might produce nonvisible disabilities, and thus, a woman presenting early symptoms of either problem might receive an incorrect diagnosis not because she is a woman, but because of the nature of the illness.

All data concerning the number of incorrect medical diagnoses were analyzed twice. The first set of analyses utilized the scores of all 80 subjects. It was noted during those analyses that while 76 subjects reported between one and five incorrect diagnoses, four subjects reported more than 10 incorrect diagnoses. It was felt that more accurate statistical results would be obtained if the four sets of extreme scores were discarded; thus the second analyses was conducted using only 76 subjects.

The investigator contacted the four subjects whose scores had been deleted, and three of them provided sufficient documentation to prove that the number of incorrect diagnoses reported were accurate. With great caution, and deference to statistical methods, it might be suggested that there are nonvisibly disabled individuals who receive more than five incorrect medical diagnoses, and that their scores, which had significant impact on the study results, ought not to be necessarily discarded.

Previous research in the area of nonvisible disability has been inconclusive and somewhat contradictory. One study concluded that nonvisibly disabled individuals were better adjusted than visibly disabled persons (Goldberg, 1974), while Wu (1963) found no difference in adjustment between the two groups. Barron (1952) found no difference in personality patterns between visibly and nonvisibly disabled subjects, and concluded that psychosocial functioning was the same for both groups. Steinhausen (1981) also found no difference in personality patterns between those with visible and nonvisible disabilities, but concluded that psychosocial functioning was easier for individuals with nonvisible disabilities. Zara (1970) concurred by stating that nonvisibly disabled persons did not expect social rejection to the same degree that visibly disabled persons did, and Richardson et al. (1974) concluded that those individuals with nonvisible disabilities were socially preferred over persons with visible disabilities. Yet Cole and Bragman (1982) found that nonvisibly disabled persons had greater difficulty in employment situations than those with visible problems. The present research study would appear to support the findings of

Wu (1963), which found no significant differences between visibly and nonvisibly disabled subjects.

Recommendations

The purpose of this study was to provide a preliminary investigation of the effects of disability type--visible or nonvisible--on the acceptance of disability and self-concept of physically disabled university students. Based upon the results of this research and the acknowledged limitations of this study, the following recommendations for future research are made.

- 1) A new scale for the measurement of acceptance of disability should be developed for use with all populations. A number of statements contained more than one issue, but allowed only a single response. Also, the wording of the statements was felt to be negative and somewhat patronizing. If the Acceptance of Disability scale is used for further research with university students, it should be noted that Linkowski originally developed this scale to measure acceptance of disability among patients in rehabilitation hospitals (Linkowski, 1971); several items on the scale are concerned with issues not relevant to disabled persons in a university setting.
- 2) In this study, no significant correlation was found between acceptance of disability and the length of time between diagnosis and the present. Previous research has indicated a positive correlation between acceptance of disability and the length of time between diagnosis and the present (Susman et

al., 1982). Future research should focus on examining this variable in relationship to acceptance of disability.

- 3) Similar research should be conducted with a less homogeneous physically disabled population. University students tend to form a homogeneous group with regards to educational background and vocational aspirations. They have also been found to have higher scores on the Acceptance of Disability scale when compared to other individuals with physical disabilities (Linkowski, 1971). Greater differences among the variables might occur by using a more widely varied physically disabled population. If, however, similar research is conducted again using university students, it is highly recommended that students with learning disabilities be included, since they comprise an increasing and significant portion of the university disabled student population.
- 4) It is probable that one explanation for the study results obtained was the extreme variability of subjects. Past research conducted with nonvisibly disabled subjects in most cases utilized only a single disease entity, limiting the application of research results to the nonvisibly disabled population as a whole. However, in this study, more than 30 distinct medical diagnoses were reported by subjects, and it is probable that the widely varied disease characteristics contributed to the lack of significant results. It is recommended that future research be conducted with a population more representative of nonvisibly disabled individuals as a whole than one disease

entity would produce, yet less varied than the population of this study. Secondly, future research should be conducted with individuals who, upon self-report, consider themselves disabled, not just individuals with particular medical conditions. A number of nonvisibly disabled subjects whose scores were used in this study met the medical criteria for inclusion, but did not feel the study was relevant to them because they did not consider their medical condition disabling.

APPENDIX A

SUBJECT CONSENT AND RELEASE FORM

- Title:** The Effect of Disability Type--Visible or Nonvisible--on the Self-Concept and Acceptance of Disability of Physically Disabled University Students
- Purpose:** To examine relationships between disability type, self-concept, number of incorrect diagnoses, the length of time between first appearance of physical symptoms and medical diagnosis, and the length of time between medical diagnosis and the present.
- Objectives:**
- 1) To demonstrate that disability type is related to self-concept and acceptance of disability.
 - 2) To demonstrate that self-concept and acceptance of disability are related to the length of time between the first appearance of physical symptoms and medical diagnosis, and the length of time between medical diagnosis and the present.
 - 3) To demonstrate that the number of incorrect medical diagnoses is related to self-concept and acceptance of disability.
- Population:** Eighty physically disabled University of Arizona and Arizona State University students.

You are being asked to voluntarily participate in this project. If you agree, you will be required to complete three questionnaires: the Subject Information Sheet, the Acceptance of Disability scale, and the Tennessee Self-Concept scale. If you have a nonvisible disability, your medical diagnosis will need to be verified by a physician.

If you decide to participate, please answer as many questions as you are able to with confidence. About 30 minutes of your time will be required. There will be no cost or reimbursement for participation in this study.

All data received will be treated confidentially. You are free to withdraw from the study at any time without incurring ill will or in any way affecting your university standing.

The information collected will be confidential and used for doctoral research. If the study is later published, the results will be discussed in terms of group responses and will be anonymous.

I have read the above "Subject Consent and Release Form." The nature and demands of the project have been explained to me. I understand that I may ask questions and that I may withdraw from the study without ill feelings or in any way affecting my university standing. I also understand that this consent form will be filed in an area designated by the Human Subjects Committee with access restricted to the principle investigator or authorized representatives of the particular department. I understand that a copy of this consent form is available to me upon request.

Subject's signature _____ Date _____

Principle investigator _____ Date _____

APPENDIX B

SUBJECT INFORMATION SHEET

Sex: M ___ F ___

Birthdate: ___/___/___
 M D Y

Year in school: Fresh ___ Soph ___ Jr ___ Sr ___ Grad ___

GPA: ___

Medical diagnosis: _____

Date of onset of first physical symptoms: ___/___
 M Y

Date of medical diagnosis: ___/___
 M Y

Your disability is obvious to other people: none of the time ___
 once in a while ___ some of the time ___ most of the time ___

Rate the severity of your disability: mild ___ moderate ___ severe ___

Was your disability ever diagnosed incorrectly? yes ___ no ___

If you answered "yes," how many incorrect diagnosis did you
receive? _____

APPENDIX C

ACCEPTANCE OF DISABILITY SCALE*

Subject No. _____

READ EACH STATEMENT AND PUT AN "X" IN THE SPACE INDICATING HOW MUCH YOU AGREE OR DISAGREE WITH EACH STATEMENT.

1. A physical disability may limit a person in some ways, but this does not mean he should give up and do nothing with his life.

<input type="checkbox"/> disagree very much	<input type="checkbox"/> agree a little
<input type="checkbox"/> disagree pretty much	<input type="checkbox"/> agree pretty much
<input type="checkbox"/> disagree a little	<input type="checkbox"/> agree very much

2. Because of my disability, I feel miserable much of the time.

<input type="checkbox"/> disagree very much	<input type="checkbox"/> agree a little
<input type="checkbox"/> disagree pretty much	<input type="checkbox"/> agree pretty much
<input type="checkbox"/> disagree a little	<input type="checkbox"/> agree very much

3. More than anything else, I wish I didn't have this disability.

<input type="checkbox"/> disagree very much	<input type="checkbox"/> agree a little
<input type="checkbox"/> disagree pretty much	<input type="checkbox"/> agree pretty much
<input type="checkbox"/> disagree a little	<input type="checkbox"/> agree very much

4. Disability or not, I'm going to make good in life.

<input type="checkbox"/> disagree very much	<input type="checkbox"/> agree a little
<input type="checkbox"/> disagree pretty much	<input type="checkbox"/> agree pretty much
<input type="checkbox"/> disagree a little	<input type="checkbox"/> agree very much

5. Good physical appearance and physical ability are the most important things in life.

<input type="checkbox"/> disagree very much	<input type="checkbox"/> agree a little
<input type="checkbox"/> disagree pretty much	<input type="checkbox"/> agree pretty much
<input type="checkbox"/> disagree a little	<input type="checkbox"/> agree very much

*Linkowski, D. 1971. A scale to measure acceptance of disability. Rehabilitation Counseling Bulletin, 1971, 14(1), 236-244.

6. My disability prevents me from doing just about everything I really want to do and from becoming the kind of person I want to be.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

7. I can see the progress I am making in rehabilitation, and it makes me feel like an adequate person in spite of the limitations of my disability.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

8. It makes me feel very bad to see all the things nondisabled people can do which I cannot.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

9. My disability affects those aspects of life which I care most about.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

10. Though I am disabled, my life is full.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

11. If a person is not entirely physically able, he is that much less a person.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

12. A person with a disability is restricted in certain ways, but there is still much he is able to do.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

13. There are many more important things in life than physical ability and appearance.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

14. There are times I completely forget that I am physically disabled.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

15. You need a good and whole body to have a good mind.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

16. There are many things a person with my disability is able to do.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

17. Since my disability interferes with just about everything I try to do, it is foremost in my mind practically all the time.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

18. If I didn't have my disability, I think I would be a much better person.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

19. My disability, in itself, affects me more than any other characteristic about me.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

20. The kind of person I am and my accomplishments in life are less important than those of nondisabled persons.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

21. I know what I can't do because of my disability, and feel that I can live a full and normal life.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

22. Though I can see the progress I am making in rehabilitation, this is not very important since I can never be normal.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

23. In just about everything, my disability is annoying to me so that I can't enjoy anything.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

24. How a person conducts himself in life is much more important than physical appearance and ability.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

25. A person with my disability is unable to enjoy very much in life.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

26. The most important thing in this world is to be physically normal.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

27. A person with a disability finds it especially difficult to expand his interests and range of abilities.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

28. I believe that physical wholeness and appearance make a person what he is.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

29. A physical disability affects a person's mental ability.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

30. With my condition, I know just what I can and cannot do.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

31. Almost every area of life is closed to me because of my disability.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

32. Because of my disability, I have little to offer other people.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

33. Besides the many physical things I am unable to do, there are many other things I am unable to do.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

34. Personal characteristics such as honesty and a willingness to work hard are much more important than physical appearance and ability.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

35. I get very annoyed with the way some people offer to help me.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

36. With my disability, there isn't a single area of life that is not affected in some major way.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

37. Though I can see that disabled people are able to do well in many ways, still they can never lead normal lives.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

38. A disability, such as mine, is the worst possible thing that can happen to a person.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

39. No matter how hard I try or what I accomplish, I could never be as good a person as one without my disability.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

40. There is practically nothing a person in my condition is able to do and really enjoy it.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

41. Because of my disability, I am unable to enjoy social relationships as much as I could if I were not disabled.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

42. There are more important things in life than those my physical disability prevents me from doing.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

43. I want very much to do things that my disability prevents me from doing.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

44. Because of my disability, other people's lives have more meaning than my own.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

45. Oftentimes, when I think of my disability, it makes me feel so sad and upset that I am unable to think of or do anything else.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

46. A disability changes one's life completely. It causes one to think differently about everything.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

47. I feel that I should be as able as the next guy, even in areas where my disability limits me.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

48. Life is full of so many things that I sometimes forget for brief periods of time that I am disabled.

<input type="checkbox"/> I disagree very much	<input type="checkbox"/> I agree a little
<input type="checkbox"/> I disagree pretty much	<input type="checkbox"/> I agree pretty much
<input type="checkbox"/> I disagree a little	<input type="checkbox"/> I agree very much

49. Because of my disability, I can never do most things that normal people can do.

I disagree very much
 I disagree pretty much
 I disagree a little

I agree a little
 I agree pretty much
 I agree very much

50. I feel satisfied with my abilities and my disability doesn't bother me too much.

I disagree very much
 I disagree pretty much
 I disagree a little

I agree a little
 I agree pretty much
 I agree very much

APPENDIX D

THE TENNESSEE SELF-CONCEPT SCALE*

	Item Number			
1. I have a healthy body	1			
3. I am an attractive person	3			
5. I consider myself a sloppy person	5			
19. I am a decent sort of person.	19			
21. I am an honest person	21			
23. I am a bad person.	23			
37. I am a cheerful person.	37			
39. I am a calm and easy going person.	39			
41. I am a nobody	41			
55. I have a family that would always help me in any kind of trouble.	55			
57. I am a member of a happy family.	57			
59. My friends have no confidence in me.	59			
73. I am a friendly person.	73			
75. I am popular with men.	75			
77. I am not interested in what other people do.	77			
91. I do not always tell the truth.	91			
Responses:				
Completely false	Mostly false	Partly false & partly true	Mostly true	Completely true
1	2	3	4	5

*Fitts, W. 1965. Manual Tennessee Self-Concept Scale. Nashville:
Counselor Recordings and Test, 1965.

	Item Number
93. I get angry sometimes.	93
2. I like to look nice and neat all the time.	2
4. I am full of aches and pains.	4
6. I am a sick person.	6
20. I am a religious person.	20
22. I am a moral failure.	22
24. I am a morally weak person.	24
38. I have a lot of self-control.	38
40. I am a hateful person.	40
42. I am losing my mind.	42
56. I am an important person to my friends and family.	56
58. I am not loved by my family.	58
60. I feel that my family doesn't trust me.	60
74. I am popular with women.	74
76. I am mad at the whole world.	76
78. I am hard to be friendly with.	78
92. Once in a while I think of things too bad to talk about.	92
94. Sometimes, when I am not feeling well, I am cross.	94
7. I am neither too fat nor too thin.	7
9. I like my looks just the way they are.	9
11. I would like to change some parts of my body.	11
25. I am satisfied with my moral behavior.	25
27. I am satisfied with my relationship to God.	27
29. I ought to go to church more.	29

	Item Number
43. I am satisfied to be just what I am.	43
45. I am just as nice as I should be.	45
47. I despise myself.	47
61. I am satisfied with my family relationships.	61
63. I understand my family as well as I should.	63
65. I should trust my family more.	65
79. I am as sociable as I want to be.	79
81. I try to please others, but I don't overdo it.	81
83. I am no good at all from a social standpoint.	83
95. I do not like everyone I know.	95
97. Once in a while, I laugh at a dirty joke.	97
8. I am neither too tall nor too short.	8
10. I don't feel as well as I should.	10
12. I should have more sex appeal.	12
26. I am as religious as I want to be.	26
28. I wish I could be more trustworthy.	28
30. I shouldn't tell so many lies.	30
44. I am as smart as I want to be.	44
46. I am not the person I would like to be.	46
48. I wish I didn't give up as easily as I do.	48
62. I treat my parents as well as I should (Use past tense if parents are not living).	62
64. I am too sensitive to things my family say.	64
66. I should love my family more.	66
80. I am satisfied with the way I treat other people.	80

	Item Number
82. I should be more polite to others.	82
84. I ought to get along better with other people.	84
96. I gossip a little at times.	96
98. At times I feel like swearing.	98
13. I take good care of myself physically.	13
15. I try to be careful about my appearance.	15
17. I often act like I am "all thumbs."	17
31. I am true to my religion in my everyday life.	31
33. I try to change when I know I'm doing things that are wrong.	33
35. I sometimes do very bad things.	35
49. I can always take care of myself in any situation.	49
51. I take the blame for things without getting mad.	51
53. I do things without thinking about them first.	53
67. I try to play fair with my friends and family.	67
69. I take a real interest in my family.	69
71. I give in to my parents. (Use past tense if parents are not living)	71
85. I try to understand the other fellow's point of view.	85
87. I get along well with other people.	87
89. I do not forgive others easily.	89
99. I would rather win than lose in a game.	99
14. I feel good most of the time.	14
16. I do poorly in sports and games.	16
18. I am a poor sleeper.	18
32. I do what is right most of the time.	32

	Item Number
34. I sometimes use unfair means to get ahead.	34
36. I have trouble doing the things that are right.	36
50. I solve my problems quite easily.	50
52. I change my mind a lot.	52
54. I try to run away from my problems.	54
68. I do my share of work at home.	68
70. I quarrel with my family.	70
72. I do not act like my family thinks I should.	72
86. I see good points in all the people I meet.	86
88. I do not feel at ease with other people.	88
90. I find it hard to talk with strangers.	90
100. Once in a while I put off until tomorrow what I ought to do today.	100

APPENDIX E

DEMOGRAPHIC DATA

	Visible N=42	Nonvisible N=38	Total N=80
Sex:			
M	22	11	33
F	20	27	47
Age:			
20	3	0	3
20-24	14	10	24
25-29	10	4	14
30-34	8	10	18
35-39	3	7	10
40-44	2	3	5
45	2	4	6
Classification:			
Freshman	5	3	8
Sophomore	8	2	10
Junior	10	4	14
Senior	12	10	22
Graduate	7	19	26
Grade Point Average:			
0.00-1.99	0	4	4
2.00-2.99	25	4	29
3.00-4.00	17	30	47
Diagnosis:			
Juvenile Rheumatoid Arthritis	3	1	4
Asthma	0	8	8
Spina Bifida	1	0	1
Stroke	1	0	1
Cerebral Palsy	8	0	8
Spinal Cord Injury	13	0	13
Post Polio	1	0	1
Deg. Disk Disease	0	2	2
Chondromalacia	0	2	2
Rheumatoid Arthritis	0	4	4
Epilepsy	0	2	2
Multiple Sclerosis	1	0	0

	Visible N=42	Nonvisible N=38	Total N=80
Diagnosis (cont.):			
Kidney Dysfunction	0	1	1
Osteogenesis Imperfectus	1	0	1
Fibrositis	0	1	1
Hearing Impairment	2	5	7
Visual Impairment	4	2	6
Chronic Obstructive Lung Disease	0	1	0
Hypertension	0	3	3
Muscular Dystrophy	0	1	1
Cardiac Dysfunction	0	1	1
Minimal Cerebral Dysfunction	0	1	1
Reiter's Syndrome	0	1	1
Bilateral AKA	1	0	1
Diabetes	0	1	1
Bilat. Poplat. Syndrome	0	1	1
Head Injury	1	0	1
Spinal Anomaly	1	0	1
Arthrogryposis	2	0	2
Cancer	1	0	1
Dystonia	1	0	1
School:			
UA	29	34	63
ASU	13	4	17
Congenital Disability:			
	16	4	20
Acquired Disability:			
	26	34	60
Severity:			
Mild	7	19	25
Moderate	22	14	36
Severe	13	5	18
Incorrect Diagnosis:			
Yes	9	17	25
No	33	21	54
Number of Incorrect Diagnoses:			
1	5	3	8
2	3	7	10
3	1	4	5
4	0	1	1
5	1	0	1
10	1	1	2
30	0	2	2

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