The Effects Of Disability Simulations On Attitudes Toward Persons With Disabilities

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THE EFFECTS OF DISABILITY SIMULATIONS ON ATTITUDES TOWARD PERSONS WITH DISABILITIES

BY

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Seton Hall University

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Chapter I

INTRODUCTION

The Meaning of Disability

The term "disability" has been conceptualized in different ways over the course of time. Historically, disability has been defined in strictly biological terms, with a primary focus on the impairment (Meyerson, 1990). People with disabilities have traditionally been identified by diagnostic labels alone, many of which carried pejorative meanings (e.g., crippled, retarded). The underlying assumption of this medically-oriented biological model was that people with disabilities were physiologically inferior to the nondisabled (Hahn, 1985). Disability has also historically been conceptualized in strictly economic terms (Hahn; Safilios-Rothschild, 1970). This approach viewed people with disabilities as limited in their ability to work and maintain economic self-sufficiency. Government agencies, through social welfare programs, indirectly popularized the economic model of disability by providing benefits to individuals who appeared to be incapable of working (Hahn, 1995). These programs were created to help people with disabilities live more independently. Some have argued, however, that these programs have also encouraged dependence upon the government as a financial provider (Havranek, 1991). The biological and economic models of disability share many aspects in common, most notably an overriding emphasis on personal and functional limitations.

Beginning in the 1980's, a major re-conceptualization of disability in terms of a social model has taken place (Meyerson, 1990). The social view of disability illuminates the negative interpersonal processes that maintain the status of people with disabilities as
second-class citizens (Meyerson). Prominent among these negative interpersonal processes are prejudice and discrimination. Secondly, the social view of disability seeks to reduce the emphasis on dysfunction and impairment, which historically has been used to characterize people with disabilities. The social model challenges the traditional view of persons with disabilities as being inferior or unable to function in society. Instead of looking only at the individual's disability, the social model considers how the environment in which the person lives can also be disabling and oppressive. Hahn (1988) has argued that a social model of disability carries political implications that are quite different from the traditional policies of the past. For example, the physical characteristics of the environment in our society are largely shaped by legislative decisions which become public policy. However, embedded in public policy are assumptions about the public themselves. Persons with disabilities historically have been overlooked or ignored due to their failure to conform to these assumptions. The lack of visibility of persons with disabilities, many of whom were formally shuttered in institutions, allowed the general public to more easily exclude this population and contributed to their status as second class citizens. Also, since public policy acts to create the physical environment, the attitudes of the general public are influential in determining the shape the environment takes.

A new awareness of the large numbers of individuals in the United States who could be described as having a disability emerged during the 1980's. Fine and Asch (1988) estimated that persons with disabilities comprised as much as 15% of the nation's population. More recent estimates place this number closer to 20%, or 49 million Americans (U.S. Census, 1998). Disability rates range from a low of 5.8% for children under 18 to a high of 53.9% for persons 65 and older.

Recent legislative efforts such as the Americans with Disabilities Act (ADA) of 1990 have sought to change public policy and end years of discrimination and exclusion of people with disabilities in many areas of society. The ADA was signed into law based on findings that people with disabilities were disadvantaged socially, vocationally,
economically, and educationally, resulting in chronic dependency and nonproduction (Pardeck, 1998). The purpose of the ADA was to not only end discrimination against persons with disabilities, but to also empower these individuals to become active, contributing members of society. One of the major successes of the ADA thus far has been the integration of persons with disabilities into a variety of employment settings (Butterworth & Kiernan, 1996). While the ADA is focused on protecting the rights of persons with disabilities in public environments such as schools and the workplace, negative attitudes and beliefs held by nondisabled individuals can manifest themselves in very subtle ways that can be resistant to change. For example, persons with disabilities are often devalued by the belief that these individuals have a poor quality of life, and are frequently blamed as being the cause of their own problems (Sobsey, 1994). Although evidence exists that the general public's attitudes are becoming more positive in the 1990's, the long history of negative attitudes held toward persons with disabilities supports the use of attitude modification strategies as a means of reducing discrimination and abuse against this population.

Investigating Attitudes Toward Persons with Disabilities

Although both positive and negative attitudes toward persons with disabilities have been found to be widespread in our society, negative attitudes may be more powerful because of their subtle pervasiveness (Wright, 1983). The presence of negative attitudes may not always be obvious or easily detected, since these attitudes are ingrained in our culture and traditions. Nondisabled individuals sometimes may not be aware that certain attitudes and behaviors are offensive to people with disabilities. For example, research suggests that attitudes perceived as being positive and helpful by nondisabled individuals (i.e., the attitude that people with disabilities should be given the privilege of special treatment) may actually be interpreted as negative and demeaning by people with disabilities (Makas, 1990). One recent study found significant differences in the verbal
behavior of nondisabled college students when addressing a student seated in a wheelchair as opposed to addressing the same student presenting without a disability (Gouvier, Coon, Todd, & Fuller, 1994). While the participants in Gouvier et al.'s study appeared to behave more helpfully to the student presenting with a disability, they also spoke more concretely and redundantly, actions which could be perceived as negative and demeaning. The Harris Poll (1991) found that the general public held ambivalent feelings toward persons with disabilities, most notably pity, admiration, embarrassment, apathy, and fear. While the results of the Harris Poll suggest that the majority of the general public support the Americans with Disabilities Act (1990), the public's rationale may also be interpreted as more of a "good will" gesture toward a minority group rather than an affirmation of people with disabilities as having equal rights and status in society (Fowler & Wadsworth, 1991). These examples suggest that the biological and economic models of disability, with their accompanying emphasis on personal and functional limitations and impairment, remain a powerful force in shaping the attitudes of nondisabled individuals toward people with disabilities.

**Attitude Modification Strategies**

The social view of disability argues that social forces, particularly prejudice and discrimination, maintain the inferior status of people with disabilities (Hahn, 1985; Meyerson, 1990). Based upon this model, one method which should facilitate greater acceptance of people with disabilities into the larger society is the creation and enhancement of positive attitudes toward people with disabilities. A full description of positive attitudes, as well as a discussion of the general characteristics of attitudes will be presented in Chapter 2. The literature reports literally hundreds of studies incorporating various strategies designed to modify attitudes toward persons with disabilities. Shaver, Curtis, Jesunathadas, and Strong (1989) analyzed 273 studies in which some type of intervention was used in an effort to modify attitudes toward persons with disabilities. Shaver et al.'s meta-analysis identified the four most successful methods of attitude
modification as persuasive messages, information plus contact, contact alone, and vicarious experience, which includes disability simulations. Interventions using persuasive messages generally present arguments designed to convince participants that they should have positive attitudes toward people with disabilities. Interventions using information present facts about people with disabilities, while contact interventions place participants in situations where they can observe or interact with people with disabilities. Finally, interventions using vicarious experience generally place participants in situations that potentially help them to experience what it is like to have disabilities. The most common type of vicarious experience is disability simulation, where participants live with a disabling condition for a period of time.

All four of these attitude modification strategies have shown some degree of success, based upon the results of Shaver et al.'s (1989) meta-analysis. However, while few researchers have debated the merits of encouraging contact between people with and without disabilities, or the benefits of providing accurate information about specific types of disabilities, the use of disability simulations as a legitimate means of attitude change has been controversial. Disability simulations place participants in situations that potentially allow them to experience the physical and/or social environments typically encountered by people with disabilities. Well-designed simulation experiences have been found to positively modify attitudes toward persons with disabilities (Donaldson, 1980; Fulton, 1976). Disability simulations have been praised for helping nondisabled people develop an awareness of how persons with disabilities learn to adapt and cope (Wesson & Mandell, 1989), and as a method for allowing the nondisabled to view persons with disabilities as similar to themselves and actively involved in their world, not simply passive participants (Wright, 1983). Lipsky (1981) has suggested that simulations can be effective in reducing the anxiety and discomfort that nondisabled people sometimes experience toward persons with disabilities. Sawyer and Clark (1980) recommended that professionals who work with persons with disabilities be exposed to simulations as part of their training so that
they may personally experience the perceptions and attitudes their clients encounter when interacting with the general public.

While some researchers have successfully modified attitudes toward people with disabilities through the use of simulations, others have argued that poorly designed and executed simulations can result in even more negative attitudes (Kiger, 1992; Wright, 1978). Because simulations attempt to reproduce the limitations imposed by a particular disability without also providing training or socialization experiences that may increase coping skills, these tasks run the risk of confirming negative attitudes toward disability and people with disabilities (Pfeiffer, 1989). Kiger has suggested that, in general, the results of simulation studies are poorly measured and evaluated, and a lack of correspondence often exists between quantitative and qualitative attitude measures. Critics of simulation studies have pointed out that few researchers have investigated the behavioral changes that presumably accompany attitude changes. By relying strictly on quantitative attitude scales, which may or may not correlate with subjects' actual behaviors toward people with disabilities, researchers may be overestimating the positive results reported in some simulation studies. Beyond research design shortcomings, simulations have been criticized for focusing only on impairment (i.e., adhering to the biological model of disability), and creating a false impression of disability (French, 1992; Kappan, 1994).

Wright (1978) has suggested that disability simulations can be improved by incorporating a coping rather than a succumbing framework into the design. Many simulation studies reported in the literature seem to emphasize the participant's imposed limitations, such as their temporary loss of vision, and the fact that the participant is dependent, relatively helpless, and very different from nondisabled people when playing the role of a person with disabilities. These studies, which appear to follow the succumbing framework, present the lifestyle of people with disabilities in negative terms, and can sometimes reinforce negative attitudes. On the other hand, the coping framework presents people with disabilities as individuals who have unique abilities, including the
ability to seek solutions, make changes, and improve the quality of their lives. Wright has advocated structuring simulations by orienting participants to be problem solvers and to become more aware of both the positive and negative social and personal events that occur during their simulation experience. This study incorporated the coping framework suggested by Wright into a disability simulation experiment.

The literature is unclear regarding the specific variables that create a meaningful simulation experience. While some researchers have obtained positive results when the participants were observed by others (Clore & Jeffery, 1972; Ibrahim & Herr, 1982), in other studies participants were not monitored at all. Although some studies have compared the effectiveness of different methods of attitude change toward persons with disabilities (e.g., simulations vs. information about disability), few studies have evaluated the effects of one type of simulation as compared to another. Many studies reported in the literature appear to make the assumption that simulations are interchangeable, and combine various types of simulations together in one intervention. These studies ignore the possibility that different types of simulations can influence attitudes in different ways. The present study attempted to measure the effects of two qualitatively different physical disability simulations by using a procedure common to both that controlled for confounding variables. The two simulations were an experience in a wheelchair and an experience on crutches. The entire study incorporated the philosophy of the coping framework (Wright, 1978) into the design and methodology.

This study compared a disability simulation using a wheelchair with one using crutches for several reasons. Crutches and wheelchairs differ in the cues each provides regarding the overall severity of disability, with the wheelchair implying more severe disability. Wheelchairs themselves carry numerous negative connotations, for example, the concept of being "wheelchair-bound" or "confined to a wheelchair." Occupants of wheelchairs can be perceived as sick, dependent, and afflicted with some type of catastrophic disability. Crutches, on the other hand, may be viewed as more commonplace among people without
disabilities, and therefore less threatening. Crutches are often utilized on a temporary basis, with the assumption that the individual will soon be healed and no longer in need of them. Rarely is this same assumption made for the user of a wheelchair. This distinction between users of crutches and wheelchairs is supported by Yuker's (1988a) construction of a disability hierarchy. Yuker notes that people with disabilities are initially perceived and evaluated strictly in terms of their disability, and that attitudes are formed based upon this evaluation. The user of a wheelchair may be more negatively evaluated than the user of crutches, based upon the unpleasant images that wheelchairs themselves can convey. A second reason for comparing wheelchairs and crutches in a disability simulation experiment is that these mobility aids differ in the amount of physical effort each requires for ambulation. Traveling distances in a manually self-propelled wheelchair is a more challenging task than traveling the same distance using crutches. Therefore, individuals who perform a disability simulation using a wheelchair should have a qualitatively different experience than those who perform a disability simulation using crutches. Finally, this study attempted to address the criticisms of simulations described above (e.g., French, 1992; Kappan, 1994), and made conclusions regarding the usefulness and efficacy of disability simulations as a means of enhancing attitudes toward people with disabilities.

Theories of Attitude Change

The use of disability simulations to modify nondisabled individuals' attitudes toward people with disabilities can be better understood through the application of consistency theories of attitudes and attitude change. Consistency theories assume that individuals have a basic need to maintain agreement between various attitudes and/or behaviors (Keisler, Collins, & Miller, 1969). One type of consistency theory, balance theory (Heider, 1958), considers two types of relationships: sentiment relations (i.e., attitudes toward another person), and unit relations (i.e., attitudes toward separate entities that are perceived as belonging together). When an individuals' attitudes toward another person or
a perceived unit are all positive or all negative, a balanced state exists. In a balanced state, there is no stress or pressure to change one's attitude. However, when both positive and negative attitudes exist, an imbalanced situation is created. The imbalanced state is assumed to be unstable and to produce psychological tension within the individual which is relieved only by changing the situation in such a way that achieves balance (Heider, 1958). Balance theory implies that persons who perceive each other as being similar should be attracted to one another, and that interaction and proximity should result in positive relationships (Insko, 1967).

Balance theory can be helpful in explaining attitude change toward people with disabilities as a result of participation in a simulation experience. Simulations can potentially highlight similarities between people with and without disabilities, and illustrate the coping and problem-solving skills possessed by persons with disabilities. These new insights, which may be gained through a simulation experience, can challenge previously held negative attitudes toward disability, thereby creating a psychologically imbalanced state. The individual would then be motivated to reduce the tension of the imbalanced state by somehow changing the situation. As Keisler et al. (1969) note, however, balance theory does not specify what actions the individual must take in order to remedy the imbalanced state.

Another type of consistency theory is cognitive dissonance (Festinger, 1957). According to the principles of cognitive dissonance, individuals hold cognitions, which may be beliefs, opinions, or attitudes, about themselves and their surroundings. Dissonance occurs when a person simultaneously holds two cognitions that are psychologically inconsistent. This inconsistency between cognitions produces a state of psychological tension or discomfort which motivates the individual to decrease their experience of tension by changing cognitions about themselves or their environment, adding new cognitions, or changing their behavior. Changes in cognitions or behavior lead to a reduction in dissonance. Aronson (1968) has stated that dissonance theory rests
upon the assumption that individuals will use rationalization in order to appear consistent to others and to themselves.

Allport (1935/1990) articulated the popularly held belief that attitudes function to predispose individuals to behave in certain ways. Dissonance theory, on the other hand, argues that attitudes can follow from behavior, and that changing people's behavior can in turn modify their attitudes (Oskamp, 1977). This radical shift in emphasis describing the relationship between attitudes and behavior precipitated an avalanche of research and emotionally charged debate over the merits of dissonance theory (Aronson, 1968). In general, research has found that attitudes are often quite poor predictors of behavior (Meyers, 1990), a finding which supports dissonance theory. Rather than behaving in accordance with an established thought, feeling, or attitude, individuals may often act themselves into a new way of thinking (Meyers, 1990). Dissonance theory succinctly explains how attitudes are often the result of behavior.

Cognitive dissonance proposes that behaving in new and different ways can result in the formation of new and different attitudes (Oskamp, 1977). Some studies have utilized the technique of role playing, or acting out the feelings and behaviors another person might display in a given situation, to further investigate the link between behavior and attitudes. One classic study investigating role playing found that a group of smokers who played the part of a lung cancer patient who was to undergo surgery significantly decreased their level of smoking for up to 18 months following the experiment (Mann & Janis, 1968). In this experiment, cognitive dissonance was created by pairing the personal experience and presumably positive attitudes toward smoking among the smokers with the psychologically inconsistent role play experience of having lung cancer. Participants could have reduced this dissonance by denying the link between smoking and cancer, by positively associating themselves with other smokers, by switching to a brand lower in tar and nicotine, or by slowing down or quitting smoking completely (Aronson, 1968). The fact that the study participants chose the most difficult task, actually quitting or decreasing
the amount of cigarettes smoked, suggests that their involvement in the role play had a powerful impact. The smokers' attitudes toward smoking were challenged by the dissonance between their smoking behavior and their role play experience, and their behavior was altered as a result.

Another important variable to consider in cognitive dissonance and role playing experiments is the amount of effort put forth by the participants. Zimbardo and Ebbeson (1970) found that subjects who were required to expend a relatively high amount of effort to accomplish a given task were more likely to report a positive attitude change than those who expended a moderate or low amount of effort to accomplish the same task, a result consistent with dissonance theory. Clore and Jeffery (1972) designed a disability simulation study incorporating the use of emotional role playing. Participants in one experimental group were presented with a brief scenario asking them to play the role of a college student who had been paralyzed in an automobile accident and now required a wheelchair for mobility. This scenario was included in the study to help subjects identify with and have empathy for the hypothetical paralyzed student. A second experimental group, the vicarious role players, were informed of the role being played by subjects in the wheelchair group, and observed the wheelchair role players as they performed the simulation. The authors indicate that the wheelchair role players traveled a fairly difficult geographical route which required a great deal of physical effort. The researchers found that the wheelchair role playing group scored highest on affective rating scales, with the vicarious role players scoring somewhat lower but not significantly different from the wheelchair group. Clore and Jeffery suggest the positive results of their study were due to the dissonance experienced by the wheelchair simulation group, as well as the empathy created through the emotional role play experience. The amount of effort required of the role players who actually performed the challenging disability simulation may have also contributed to their higher scores. Ibrahim and Herr (1982) asked their participants to role play an individual with a speech or hearing impairment. The role players were
required to actively prepare by developing, describing, and acting out their roles for a period of five hours. A second experimental group were passively exposed to films, a slide show, and reading about problems encountered by persons with disabilities, also for a period of five hours. The role play group displayed a greater positive attitude change than the second experimental group and a no-treatment control group. The active involvement and greater effort expended by the role players in this experiment can help to explain their more pronounced attitude change. The results of Clore and Jeffery (1972) and Ibrahim and Herr (1982) suggest that role play can help to promote attitude change when used in a disability simulation study.

A final variable which merits consideration is whether or not individuals performing a disability simulation are observed by others. The wheelchair role playing participants in Clore and Jeffery's (1972) study were observed by the vicarious role players. Unfortunately, the authors fail to indicate if the wheelchair participants were informed about the observers. The role play group in Ibrahim and Herr's (1982) study were observed by the experimenter and the other role players. However, in many simulation studies reported in the literature, subjects were not formally observed carrying out their assignment, which raises serious questions about the validity of these experiments. Observation is critical from a researcher's perspective to ensure that all participants perform the tasks required by the experiment, thereby avoiding potential confounds. From the subject's perspective, observation may enhance the emotions experienced through performing the simulation. Participants who are aware that they are being observed may feel pressure to take their experience very seriously, and may put forth greater effort to accomplish the experimental tasks. Informed observation may play a role in creating a higher level of cognitive dissonance in the subjects, which can lead to greater attitude change.

This study investigated the effects of a disability simulation experience on the attitudes of nondisabled college students toward people with disabilities. This study is unique in
that it combined aspects of emotional role play (Clore & Jeffery, 1972; Ibrahim & Herr, 1982; Mann & Janis, 1968) with the coping framework of disability (Wright, 1978). This study also investigated the differences between two qualitatively different physical disability simulations (i.e., wheelchair vs. crutches) and the presence or absence of informed observation of the simulation experience on participants' attitudes toward persons with disabilities.

Statement of the Problem

This study examined the attitudes of nondisabled college students toward persons with disabilities. This investigation sought to determine if disability simulations are effective in positively modifying nondisabled college students' attitudes toward persons with disabilities. This study explored the effects of two qualitatively different simulation experiences (i.e., wheelchair simulation and crutches simulation) on students' attitudes. This study also explored the effects of informed observation and the lack of informed observation of the simulation experience on students' attitudes. Additionally, this study sought to determine if, following the simulation experience, a significant correlation existed between a measure of students' global attitudes toward persons with disabilities and a measure of the students' commitment to personally participating in activities that would bring them in contact with persons with disabilities on their college campus.

The instrument used to measure students' global attitudes was the Attitudes Toward Disabled Persons Scale - Form A (ATDP; Yufer & Block, 1986). The ATDP - Form A is a 30 item inventory consisting of statements about persons with disabilities. Respondents indicate their level of agreement or disagreement with each statement using a six-point Likert-type scale. Yufer and Block indicate that higher scores on the ATDP imply positive, accepting attitudes while lower scores reflect negative, rejecting attitudes. A second instrument which has been designed specifically for this research project, the disability interest questionnaire (DIQ), was used as the behavioral dependent variable.
Participants were asked to respond to two questions that assessed their willingness to participate in future activities and become personally involved with persons with disabilities on their college campus.

Hypotheses

1. Nondisabled college students participating in a disability simulation experience will demonstrate significantly greater positive attitudes, as measured by the ATDP - Form A, than nondisabled college students participating in a no-treatment control group.

   Based upon cognitive dissonance theory, it was hypothesized that individuals who participated in either physical disability simulation (i.e., wheelchair or crutches) would demonstrate significantly greater positive attitude change, as measured by the ATDP - Form A, than individuals who participated in a no treatment control group. Participants who took part in the simulations were also part of a role play exercise, and had the opportunity to act out the behaviors and experience the emotions felt by those people with disabilities who regularly use wheelchairs or crutches. The new behaviors and experiences of the subjects participating in the simulations could create new cognitions that challenged pre-existing attitudes, particularly those attitudes which view people with disabilities as different or inferior. Previous research has suggested that role play, particularly role plays with emotional components, can be effective in positively modifying attitudes (Clore & Jeffery, 1972; Ibrahim & Herr, 1982; Mann & Janis, 1968).

2. Nondisabled college students participating in a disability simulation experience using a wheelchair will demonstrate significantly greater positive attitudes, as measured by the ATDP- Form A, than a second experimental group using crutches.

   The second hypothesis stated that individuals who participated in a disability simulation using a wheelchair would demonstrate significantly greater positive attitude change than individuals who used crutches. Based on dissonance theory, the greater hypothesized attitude change among the wheelchair group can be attributed to this group's greater effort
to accomplish the tasks of the experiment. The wheelchair group encountered more physical and environmental obstacles than the crutches group, and may also have experienced a greater amount of stress and anxiety due to the negative connotations associated with the use of a wheelchair. The aversive nature of the wheelchair simulation task, as compared to the crutches simulation task, created a higher level of dissonance which could be alleviated through a positive change in attitude toward the task itself and toward persons with disabilities. The literature on cognitive dissonance has supported the concept that greater effort produces greater dissonance (Aronson, 1968; Zimbardo & Ebbeson, 1970).

3. Nondisabled college students participating in a disability simulation experience who have been informed that they will be observed will demonstrate significantly greater positive attitudes as measured by the ATDP - Form A, than a second experimental group who have not been informed that they will be observed.

The third hypothesis stated that individuals who were informed that they were being observed during their simulation experience would demonstrate greater positive attitude change than individuals who were not informed of observation. Those participants who were aware of observation may have felt more pressure to perform the tasks of the experiment to the best of their abilities. This subjective pressure to perform may have led to a greater effort put forth by these participants, which could create more dissonance and result in greater attitude change. Previous studies have found that subjects who are observed while performing simulation exercises tend to exhibit positive attitude changes (Clore & Jeffery, 1972; Ibrahim & Herr, 1982; Pfeiffer, 1989).

4. A significant correlation will exist between the two measures of attitudes used in this study, the ATDP - Form A (posttest) and the DIQ, among a group of nondisabled college students participating in a disability simulation experience.

The fourth hypothesis, which stated that the ATDP - Form A and DIQ would correlate among the individuals who participated in the simulations, is a test of the behavioral
validity of the experiment. The DIQ was specifically constructed for this study as a behavioral dependent variable which measured subjects' commitment to personally becoming involved in activities related to persons with disabilities. It was hypothesized that individuals who reported positive attitudes on the ATDP - Form A would also indicate a greater willingness to actively participate in situations meaningful to persons with disabilities on their college campus, as measured by the DIQ.

Significance of the Study

The rise of the social model of disability (Hahn, 1985; Meyerson, 1990) has placed a new emphasis on the role that societal attitudes play in maintaining the prejudice and discrimination that is experienced by many people with disabilities. Negative attitudes contribute to a hostile environment which can be more formidable to persons with disabilities than their disability itself (Hahn). Positively modifying nondisabled individuals' attitudes toward persons with disabilities appears to be an important way of establishing a more accepting environment where persons with disabilities can be viewed as individuals having equal rights and opportunities.

The major purpose of this study was to investigate the potential of disability simulations to change attitudes in a positive way. Implicit in attempting to positively modify attitudes is the assumption that existing attitudes are negative, or at least that existing attitudes are not yet as positive as they can potentially be. This assumption regarding pre-existing attitudes was tested using a sample of 35 undergraduate students enrolled in introductory education courses at a private university in the northeast. Among this sample, 51% were secondary education majors, 10% were health and physical education majors, and 2% were elementary education majors. The remaining 37% of the sample were majoring in areas other than education (e.g., history, English). These 35 students were administered the Attitudes Toward Disabled Persons Scale - Form A (ATDP - Form A; Yuker & Block, 1986) during the Spring 1996 semester. This sample
of students demonstrated an average score of 125 on the ATDP - Form A with a standard deviation of 22.7. By comparison to data reported in Yuker and Block, the mean score of this sample is not markedly different from the mean scores of other groups of undergraduates who have taken the ATDP. For example, a 1978 sample of 52 undergraduates demonstrated a mean score of 130.8 on the ATDP - Form A, while a 1982 sample of 432 undergraduates yielded an average score of 123.5 (standard deviation scores were not reported for these samples) (Yuker & Block). The standard deviation of the scores in the present sample (22.7) indicates a relatively wide range of scores. In fact, the range of scores for this sample was 169 to 39. Additionally, since the highest possible score on the ATDP is 180, the average score of the present sample is far below what could be considered the "most positive" attitude as measured by this instrument.

This baseline data does not support the existence of wide-spread negative attitudes toward people with disabilities at this particular university. Rather, this data does suggest that a fairly broad range of attitudes toward people with disabilities does exist, ranging from extremely negative to extremely positive, with most students scoring in the moderately positive range. Given that most of the students in the sample did not score near the ATDP - Form A maximum of 180, this data also suggests that positively modifying attitudes as measured by the ATDP is a possibility. In this study, the disability simulations can be considered successful if the results reflect the positive modification of negative attitudes, in addition to the further enhancement of pre-existing positive attitudes, as measured by the ATDP - Form A.

Limitations of the Study

The limitations of this study can be considered in terms of internal and external validity. If an experimental design adequately controls for extraneous, confounding variables, it can be described as having good internal validity (Borg & Gall, 1989). Perhaps the most serious threat to internal validity in this experiment comes from the pretest-posttest
design. As Borg and Gall note, when individuals are retested on a particular instrument, their scores tend to fluctuate toward the mean. This phenomenon, known as statistical regression, can account for changes in scores from pretest to posttest, rather than the experimental intervention. In this study, the confounding effects of regression toward the mean were addressed through the use of a control group. The control group (control group A) was pretested and posttested on the dependent measures, but did not participate in a disability simulation. If regression toward the mean was a confound, then the scores of the experimental group as well as the control group should fluctuate in similar ways from pretest to posttest. The results of the study, which are presented in Chapter 4, show that the scores did not change in a systematic way, which suggests that the effects of regression toward the mean were not present.

External validity refers to the generalizeability of the results of one experiment to other settings (Borg & Gall, 1989). Since the subject population in this experiment included only undergraduate students from psychology courses, the results are limited in their generalizeability to other undergraduate students with similar characteristics. Participation in the experiment was strictly voluntary, and all individuals who completed the study were awarded extra credit in their courses. However, the sample may be biased in certain ways because only volunteers were used. For example, the sample may be biased toward students who had poor grades and therefore needed extra credit, or toward more inquisitive students who chose to participate in a psychology experiment, or toward those students who had an interest in people with disabilities. This problem of subject self-selection in the research was addressed through random assignment of each participant to the various treatment conditions.

Another threat to external validity is pretest sensitization, which occurs when the pretest interacts with the experimental intervention and influences the results (Borg & Gall, 1989). The issue of pretest sensitization was addressed in several ways. First, pretesting was performed in classrooms and administered to the entire class, while
posttesting took place in the psychology lab on an individual, subject-by-subject basis. The environmental conditions were very different from pretest to posttest. Secondly, a period of time between three to ten weeks elapsed between the pretesting and the posttesting. This time span helped to minimize any immediate carry-over effects influenced by the pretest. Additionally, the second instrument used as a dependent variable in this study, the DIQ, was administered only once. Data collected by the DIQ was not affected at all by pretest sensitization. Finally, the experimental design, which will be more fully described in Chapter 3, included a posttest-only control group who were never administered the pretest. The data analysis outlined in Chapter 4 found that this group's posttest scores on the ATDP were not significantly different from the posttest scores of the other control group who received both a pretest and a posttest. This finding suggests that pretest sensitization effects in this experiment were not present.

A final limitation of the study involves the lasting effects of any potential change in attitudes toward persons with disabilities. If individuals did demonstrate more positive attitudes following their participation in the experiment, how long would these changes be expected to last? Two simulation studies, which are more fully described in Chapter 3, investigated the permanence of attitude changes. Ibrahim and Herr (1982) found that positive changes in attitudes among simulation subjects based on ATDP scores were still evident at a 6 week follow up. Clore and Jeffery (1972) found that their simulation participants were more likely than control subjects to support increased facilities for people with disabilities at their college four months following their participation in the experiment. These studies both support the notion that attitude changes following participation in a disability simulation experience can be expected to last for a period of time ranging from weeks to months. However, more research is needed before definite conclusions regarding the permanence of attitude changes can be made.
Chapter II

LITERATURE REVIEW

This chapter is divided into four major sections which, collectively, provide the conceptual and research background for this study. The first section presents literature on the concepts of attitudes, prejudice, stereotypes, and discrimination. The second section discusses attitudes as they apply specifically to people with disabilities. The third section focuses on strategies for modifying attitudes toward persons with disabilities, including simulations, and presents a theoretical framework for attitude change. The final portion of the chapter examines limitations and criticisms of the simulation research, and discusses how this study addressed these issues.

Attitudes and Prejudice

The Nature of Attitudes

The topic of attitude formation and attitude change has remained one of the most researched areas in the social sciences for over 60 years (Petty, 1995). Allport (1935/1990) summarized the early work in this area by stating that attitudes function to predispose individuals to respond to a given situation in a certain way. Allport outlined four conditions determining attitude formation: (a) attitudes form through the integration of various experiences, (b) through the differentiation of basic positive/negative (i.e., approach-avoidance) evaluations which occurs as part of the developmental process, (c) through one single traumatic event or experience, and (d) through the imitation of others. Over the years, the literature on attitudes has become more complex. Although early
research supported the idea that attitudes often predict behavior, many social psychologists today argue that attitudes follow from behavior (Meyers, 1990). Olson and Zanna (1993) have suggested that attitudes have a strong evaluative component, are represented or stored in memory, and contain affective, behavioral, and cognitive components. Olson and Zanna list three conditions for attitude formation, all of which occur within a social context: (a) expectations regarding an interaction with an attitude object, (b) being asked about one's attitude, and (c) having a good amount of knowledge concerning a particular issue. Attitudes can serve a knowledge function, such as helping an individual interpret and evaluate experiences, and a utilitarian function, such as helping an individual gain rewards and avoid punishments. Attitudes can also serve a value-expressive function by allowing an individual to internalize and express values, and an ego-defensive function by helping to protect people from threatening truths and enhance their self-image (Petty, 1995). Negative attitudes toward minority groups such as persons with disabilities may serve an ego-defensive function, allowing the majority group to feel superior by disparaging the minority group (Petty).

Prejudice, Stereotypes, and Discrimination

Allport (1954) defined prejudice as a strong dislike of an individual or group. Prejudice may often arise from visible cues, such as skin color, that set an individual or a group apart from the majority. Observed differences are typically described in terms of emotionally toned labels which devalue the individuals displaying the visible cues. Allport suggested that prejudice has a strong cognitive component in which negatively evaluated attributes observed in the individual are elaborated and generalized to the entire group (and vice-versa), thereby forming categories. Once formed, these categories are extremely resistant to change.

More recently, Devine (1995) offered definitions of prejudice, stereotypes, and discrimination. Prejudice refers to negative feelings toward individuals based solely on their group membership. Based on Devine's definition, the cognitive component of
prejudice discussed by Allport (1954) (i.e., overgeneralizations) can be interpreted as a stereotype, while any form of negative behavior directed against individuals because of their group membership can be labeled discrimination. Olson and Zanna (1993) described the interrelationship between the affective, cognitive, and behavioral elements of prejudice by suggesting that prejudice often arises from negative group stereotypes and can sometimes predict discriminatory behavior toward minority group members. Prejudiced attitudes develop with age and are associated with certain personality characteristics, including authoritarianism and religiosity.

Devine (1995) has noted several limitations in defining prejudice in terms of negative feelings, thoughts, and behaviors. For instance, a person may be aware of stereotypes about a particular group without holding strong feelings of prejudice toward that group. Also, discrimination does not always follow from prejudiced attitudes. Nevertheless, prejudice is a multidimensional phenomenon that does appear to encompass negative attitudes, evaluations, or affect, a behavioral component (i.e., avoidance or aggression), and a cognitive component (i.e., overgeneralization). Prejudice also tends to occur between groups of differing social status, which highlights the influence of intergroup bias between members of the perceived in-group and members of the perceived out-group.

Attitudes Toward persons with Disabilities

Altman (1981) has argued that persons with disabilities are strongly affected by the attitudes of their peers and significant others, the attitudes of professionals who control services, jobs, and opportunities, such as doctors, social workers, and employers, as well as the attitudes of the general public. While positive and accepting attitudes toward disability can enhance the individual’s adjustment, self-esteem, and self-confidence, negative and rejecting attitudes can foster an environment of prejudice and discrimination that in and of itself is disabling (Hahn, 1995). For many years it has been recognized that people with disabilities are frequently perceived as being different from the nondisabled,
and in some instances they have been labeled depressed, dependent, isolated, and emotionally unstable (Altman, 1981; Furnham & Pendred, 1983; Yuker et al., 1966). These labels tend to categorize people with disabilities and encourage negative group stereotypes (Allport, 1954). Over the years, negative attitudes toward people with disabilities have largely been maintained through various cultural forces and through the influence of the media (Vargo, 1989).

Cultural Influences

In the United States, the cultural status of persons with disabilities has been compared to that of minority groups (Safilios-Rothschild, 1970; Wright, 1983). The Americans with Disabilities Act (ADA) of 1990 formally recognized persons with disabilities as a minority group, which suggests that many of the problems faced by this population are related to their inferior status in society (Pardeck, 1998). People with disabilities, for various reasons, have historically been excluded from activities nondisabled persons take for granted, and so take on the status of an underprivileged group. Individuals with disabilities, particularly those with disabilities that are visible, tend to be stigmatized for differing from what society considers normal (Goffman, 1963). Pulton (1976) suggests that the stigmatization of people with disabilities carries with it a general devaluation of the entire person, including those aspects of the individual not affected by the disability. Stereotypes implying that people with disabilities are dependent and depressed illustrate how demeaning personality characteristics can be inferred about individuals based solely upon their disability. Eisenberg (1982) has argued that stigmatizing others serves as a defense against anxiety when confronted by unfamiliar people and situations. A person with disabilities is stigmatized by being labeled as different from the norm, which allows for all reactions to that person to be framed in terms of their perceived deviant characteristic. Thus, the label defines the person.

Fine and Asch (1988) summarize the influence of cultural attitudes by listing several common assumptions about the meaning of disability: people with disabilities are victims,
people with disabilities need help and social support, and most of the problems faced by people with disabilities are due to their impairment. As Fine and Asch point out, these cultural assumptions, which view people with disabilities as passive recipients rather than active members of their community, are based upon the traditional medical and economic models of disability. These assumptions, along with the traditional models of disability they represent, cast the person with disabilities in the "sick role" and imply helplessness and dependence.

Sobsey (1994) has proposed that certain cultural attitudes toward persons with disabilities have contributed to the abuse of these individuals over the years. Language has been used to dehumanize persons with disabilities and conceptually separate them from the nondisabled. For example, labeling a person as "retarded" does little to explain that individual's disability, but simply identifies him or her as being different from the norm. The term "developmentally disabled" is more descriptive and carries less negative connotations than "retarded." In the past, terms such as idiot, imbecile, and moron were used to describe various levels of mental retardation. The demeaning nature of these words is reflected by their common use today as insults and put-downs. Sobsey suggests that the current practice of using the phrase "individuals with disabilities," as opposed to "disabled individuals," though well-intentioned, may actually over-emphasize and draw more attention to the disability. Special rules and political correctness can sometimes highlight, rather than minimize, differences. However, others have argued convincingly that the person should be identified prior to any mention of the person's disability.

The stigmatization of people with disabilities may have contributed to their historical segregation and exclusion from the larger society. Foucault (1965) described the origins of asylums in Europe as places where those persons thought to be mentally ill could be separated and restrained, thereby protecting the general public from deviants. In the United States, huge institutions were ostensibly created to better serve the needs of particular stigmatized populations (e.g., persons with mental retardation), although this
policy also effectively isolated these groups from the community (Ferleger & Boyd, 1980). Institutional populations swelled until the discovery of widespread abuse prompted major changes regarding the provision of quality care for special populations. Segregation finally gave way to the re-integration of these populations back to the community. Although the issue of abuse has been addressed, other problems remain for formerly institutionalized individuals, including a lack of adequate medical and mental health care, homelessness, drug abuse and alcoholism, and limited job opportunities.

Some attempts to stigmatize and segregate individuals seem to have racial overtones. Lipsky and Gartner (1995) argue that minority school children, particularly African-American males, are much more likely to be labeled retarded, learning disabled, and emotionally disturbed than their white counterparts. Some of this disproportionate labeling may be the result of subtle ethnic stereotypes held by teachers and other school professionals. Townsend (1990) has suggested that ethnic stereotypes and stereotypes of disability serve the same purpose: to define a boundary between the in-group and the out-group, and to ensure that the out-group (i.e., ethnic minorities, people with disabilities) remain in a subordinate role. However, unlike ethnic minority groups, who share a common identity and culture, people with disabilities have the additional disadvantage of living largely isolated from one another. Although people with disabilities face many challenges in fostering a greater awareness of the issues they encounter together as a minority group (Fine & Asch, 1988), in recent years many have taken steps to develop a stronger sense of community (Meyerson, 1990). The ADA of 1990 has helped to increase the visibility of persons with disabilities in schools, workplaces, and many other areas of society. While cultural attitudes toward persons with disabilities in the U.S. still show room for improvement, the situation is even worse in developing nations (Tate & Weston, 1982). In Third World countries, where malnutrition plays a key role in the etiology of disabilities, women are an especially high risk group. Women with disabilities are often
seen as having little value to the society, and are relegated to a life of poverty (Tate & Weston).

**Media Influences**

The mass media, through movies, television, radio, newspapers, and magazines, is influential in the development of attitudes and opinions about people with disabilities (Elliot & Byrd, 1982; Ruffner, 1990; Vargo, 1989). Historically, many media portrayals of persons with disabilities have reinforced negative attitudes and stereotypes held by the general public. As Bogden, Biklen, Shapiro, and Spelkoman (1990) point out, people with disabilities have long been cast as "monsters" in horror and science fiction films. Disability as a metaphor for evil is evident in comic book characters, where villains are typically disfigured, ugly creatures. Bogden (1988) proposed that circus sideshows, or freakshows, a staple of American entertainment for 100 years, helped to foster the negative media image of the disabled. When people with disabilities are not portrayed as monsters, they are typically seen as sick and dependent, or they are not seen at all (Ruffner). The influence of the media in the formation of attitudes is also expressed through advertising strategies. Fund-raising telethons, although well intentioned, frequently humiliate persons with disabilities who are showcased for their emotional appeal (Elliot & Byrd). These campaigns have reinforced the image of people with disabilities as dependent, needy persons who require special attention (Brolley & Anderson, 1990).

Fortunately, as the influence of the media on attitudes has become more understood and appreciated, advocates for people with disabilities have been successful in creating more positive images of disability in the media (Brolley & Anderson, 1990). Persons with disabilities have more recently been portrayed as capable and independent (e.g., ABC television's "Life Goes On"), and the visibility of people with disabilities in the media is increasing (e.g., Christopher Reeve). However, Sobsey (1994) notes several important limitations regarding the influence of the media on attitudes toward persons with
disabilities. Media agencies have their own agendas, and can be swayed by advertisers. The mass media tend to provide only superficial coverage of any one particular issue, and are limited by time, space, and the knowledge of their audience. Also, while the media are often effective at building upon preexisting public sentiments, changing these points of view is much more difficult to achieve. Even though media images have become more enlightened in recent years, many traditional negative stereotypes remain to be challenged.

**Attitudes Toward Specific Disabilities**

An individual's perception of a person with disabilities is a complex process moderated by factors such as the attitudes of the perceiver, the attributes of the person being perceived, and the physical and social environment or context (Yuker, 1988a). Although the physical appearance of the person with disabilities plays a major role in how they are perceived, his or her interpersonal behavior is equally important. Elliot, MacNair, Yoder, and Byrne (1991) examined participants' reactions to a videotape in which an actor was portrayed as nondisabled or as having a disability (i.e., sitting in a wheelchair), and as displaying either socially appropriate or depressed behavior (i.e., expressing sadness and pessimism). Participants who were exposed to the depressed actor reported the highest level of negative thoughts and affect, regardless of whether the actor was sitting in the wheelchair or not. Participants who viewed the socially appropriate physically disabled actor demonstrated significantly more positive thoughts about the actor than subjects in any of the other conditions. In a similar experiment by Gething (1992), the presence or absence of a physical disability was co-varied with gender and manner of behavior (i.e., shy, neutral, or brash) as portrayed by an actor in a video. Although subjects in this study devalued the actor in the wheelchair, the strongest predictor of negative attitudes was the behavior exhibited by the actor, with shy behavior eliciting stronger negative responses. The results of Elliot et al. and Gething suggest that negative attitudes toward a person with disabilities become more salient when the person behaves in a stereotypical manner (i.e., seems depressed, shy, nonassertive, and unable to cope). The findings of Elliot et al.
also imply that perceived mental illness is less desirable than perceived physical impairment.

Furnham and Pendred (1983) modified the Attitudes Toward Disabled Persons Scale (ATDP; Yuker, Block, & Younng, 1966) to reflect four distinct types of disabilities: blindness, deafness, Down's Syndrome, and educational subnormality (i.e., mental retardation). Participants' attitudes toward persons with physical disabilities (blindness and deafness) were significantly more positive than attitudes toward persons with mental disabilities (Down's Syndrome and educational subnormality). Anderson and Antonak (1992) required their study participants to view a videotape portraying an actor with either a physical disability (seated in a wheelchair) or a speech disability (stuttering). Surprisingly, participants' ratings of social acceptance were significantly lower regarding the actor with the speech disability as compared to the actor with the physical disability.

Other researchers have investigated behaviors toward individuals with physical disabilities. Gouvier, Coon, Todd, and Fuller (1994) found that college students responded differently to a person with and without a disability when asked for directions. The students used more words and spoke more concretely and redundantly to an individual seated in a wheelchair than to a person who did not appear to have a disability. Even though participants spoke "down" to the person seated in the wheelchair, much like a parent speaking to a very young child, the apparently disabled individual did not report feeling that they were being discriminated against. Rather, subjects tended to behave more helpfully to the person seated in the wheelchair than to a nondisabled person. Gouvier et al.'s study provides behavioral evidence that people with disabilities are treated differently than people without disabilities. Stephens and Clark (1987) required their study participants to complete a survey while sitting at a table next to a confederate who was either seated in a regular chair or seated in a wheelchair. Subjects sat significantly closer to the confederate when he was seated in the regular chair as opposed to the wheelchair. While the authors suggest that these results imply approach or avoidant behavior based
upon observed disability, another interpretation is that the participants sat farther away from the confederate in a wheelchair simply to provide that individual with more room to maneuver. However, more than half of the participants chose to sit in a chair that was over nine feet away from the confederate, as opposed to another chair that was only three feet away. The confederate appeared to have enough space available for maneuvering, leading Stephens and Clark to conclude that their observed difference was based upon the confederate's disability.

While the results of Gouvier et al. (1994) and Stephens and Clark (1987) indicate that people behave differently toward individuals who appear physically disabled, the results of Anderson and Antonak (1992), Furnham and Pendred (1983), and Elliot et al. (1991) all suggest that some types of disabilities are evaluated more negatively than others. Yuker (1988a) analyzed the results of 53 studies investigating attitudes toward persons with disabilities to create a disability hierarchy. The types of disabilities ranked as being most acceptable included diabetes, ulcers, arthritis, asthma, and heart conditions. The types of disabilities ranked as being least acceptable included tuberculosis, cerebral palsy, mental retardation, mental illness, and multiple disabilities. Yuker noted the influence of the label on the corresponding attitude toward a specific disability. For example, emotional disturbance received much more favorable ratings than mental illness, although these two terms are frequently used interchangeably. The disability hierarchy constructed by Yuker supports the notion that attitudes toward persons with disabilities differ according to the nature of the disability and the label it carries. Furthermore, the results of other studies cited above suggest that even though people who appear disabled tend to be treated differently, nondisabled individuals' attitudes can be moderated by the behavior the person with disabilities exhibits, with socially appropriate behavior influencing the most positive attitudes (Elliot et al; Gething, 1992).
Identifying Positive Attitudes Toward Persons with Disabilities

There has been debate over exactly what constitutes positive attitudes toward people with disabilities. Westwood, Vargo, and Vargo (1981) have suggested that two types of common misconceptions about people with disabilities have contributed to negative attitudes. These misconceptions portray people with disabilities as having either inferior status (i.e., they have little value to society and should be treated accordingly), or salutary status (i.e., they possess more positive qualities than nondisabled people and are in some ways superior). While the former of these misconceptions obviously contains negative stereotypes and prejudices toward people with disabilities, the latter initially appears to convey a positive attitude. However, salutary status is typically only granted to a select few individuals who, in society's view, have overcome tremendous odds to succeed (e.g., Franklin Delano Roosevelt) (Wright, 1983). This view implies that one must first view persons with disabilities as overcoming more obstacles in order to grant the privilege of superiority to a select few.

Both misconceptions identified by Westwood et al. (1981) convey the impression that nondisabled individuals see people with disabilities as being somehow different from them. Yuker and Block (1986) used this concept of perceived difference as the basis for their Attitudes Toward Disabled Persons Scale (ATDP). Positive attitudes, as reflected by the ATDP, imply a perceived similarity between persons with and without disabilities. Conversely, negative attitudes correspond with perceived dissimilarity. Yuker (1965) has defined "correct" attitudes as a willingness to accept the person with disabilities for whom he or she is, as well as the ability to appreciate his or her unique qualities as an individual. "Incorrect" or negative attitudes involve the perception of people with disabilities in a stereotypical or stigmatized manner, with the emphasis falling on the disability rather than the person.

Thus, positive attitudes include aspects of perceived similarity between people with and without disabilities, as well the ability of the nondisabled to relate to persons with
disabilities as individuals. Furnham and Thompson (1994) investigated the concept of perceived similarity between people with and without disabilities using the ATDP. These researchers administered the ATDP to a group of 26 wheelchair users and 29 nondisabled individuals under two conditions. First, individuals in both groups were instructed to complete the scale as an honest, self-report measure. Following this initial administration of the ATDP, the study participants were then asked to complete the scale again as they thought a member of the other group might complete it. The researchers then examined the actual versus the predicted attitudes of each group. Both groups agreed that wheelchair users face difficulties gaining work and promotions and would benefit from increased facilities for persons with disabilities. Additionally, the overall mean scores for the actual attitudes of both groups were nearly identical, suggesting that each group's global attitudes toward people with disabilities were very similar. However, the wheelchair group predicted the attitudes of the nondisabled group as being significantly more negative than they actually were. Specifically, the wheelchair group incorrectly believed the nondisabled group saw them as different and abnormal, more needful of special concessions, and preferring to remain segregated from the larger society. On the other hand, the nondisabled subjects predicted the attitudes of the wheelchair group to be largely positive. Although this study's sample size was small, the results of Furnham and Thompson support the notion that the perception of similarity or dissimilarity between groups has a powerful effect on attitudes. The results also suggest that both majority and minority group members are capable of holding negative and potentially prejudiced attitudes toward one another.

While Furnham and Thompson (1994) found that people with and without disabilities run the risk of misperceiving each other's attitudes, Makas (1990) discovered that these two groups also have different conceptions of what exactly constitutes a positive attitude. Makas compared disabled respondents' scores on an attitudinal measure with that of college students. The students were first required to answer all questions honestly, and
then complete the scale again under instructions to "fake well" (i.e., try to convey a more positive attitude). Makas found two distinct categories of responses that, instead of becoming more positive under the "fake well" condition, actually conveyed stronger negative attitudes when compared to the scores of the respondents' with disabilities. These two categories suggested that people with disabilities should be afforded special treatment due to their disability, and that people with disabilities had only positive qualities and were without faults (i.e., they had salutary status). The respondents with disabilities, on the other hand, saw positive attitudes as either promoting the social and civil rights of people with disabilities, or viewing them as having the same strengths and weaknesses as people who were nondisabled. Makas' study points out the difficulties in defining what is meant by "positive" attitudes. However, the respondents with disabilities in Makas' study appeared to agree with Yuker and Block (1986) that positive attitudes reflect a perceived similarity between people with and without disabilities. While other aspects of positive attitudes may be debated, the perception of similarity between the disabled and nondisabled appears to be a core component which can promote acceptance and equality between these two groups. Thus, the ATDP (Yuker & Block) may be the most valid measure of attitudes toward people with disabilities.

Strategies for Modifying Attitudes Toward Persons with Disabilities

Numerous studies reported in the literature have attempted to modify nondisabled individuals' attitudes toward persons with disabilities using a wide variety of techniques. Shaver et al. (1989) identified 273 studies in which some type of intervention was used. The results of Shaver et al.'s meta-analysis suggest the most effective attitude modification strategies are, in order, persuasive messages, information plus contact, contact alone (without any accompanying information), and vicarious experience, which includes disability simulations. However, a closer examination of the data used by Shaver et al. reveals that the categories describing the various attitude modification strategies can be
misleading. For example, the category of vicarious experience includes 58 studies which used the techniques of simulation, role play, observing role plays or simulations, watching videos or films, or a combination of these techniques. Only 26 of the 58 studies in this category used simulations exclusively. If these 26 simulation studies were separated from the other vicarious experience studies and considered a unique group, simulations would be the second most effective attitude modification strategy, behind only persuasive messages. While the category of persuasive messages was found to be the most effective strategy, the number of studies representing this category ($n = 23$) was also the smallest among the top four strategies. If there were a larger sample size for this category, persuasive messages may not have remained ranked at number one. In any event, the breakdown of the attitude modification categories used by Shaver et al. is open to debate. The following discussion highlights the characteristics of each of the four most effective attitude modification strategies, as determined by the results of Shaver et al.

Interventions using persuasive messages generally present arguments designed to convince participants that they should have positive attitudes toward people with disabilities (Shaver et al., 1989). Persuasion techniques move beyond simply providing accurate information about people with disabilities. Rather, these interventions use strategies such as media, readings, and lectures as evidence that positive attitudes need to be held toward persons with disabilities. Discussing the achievements of historical or popular figures who have some type of disability, for example, Helen Keller and Stevie Wonder (Simpson, 1980), or presenting films and television programs portraying people with disabilities in a favorable light, such as The Elephant Man, Children of a Lesser God, and Life Goes On (Eichinger, Rizzo, and Sirotnik, 1992), are two common persuasion interventions.

Interventions using information present facts about people with disabilities, such as the etiology of the disability, its characteristics, and similarities with nondisabled, while contact interventions place participants in situations where they can observe or interact
with people with disabilities (Shaver et al., 1989). Although these two types of interventions have been used separately, they are more effective when used together (Shaver et al.). Information about persons with disabilities is generally provided in an educational format, with the assumption that accurate information about disability will lead to more positive attitudes toward people with disabilities (Westwood et al., 1981). In reviewing the literature, Pfeiffer (1989) has noted that information seems to be most successful when used to modify the attitudes of children and adolescents. Sandler and Robinson (1981) agree that accurate information can be a useful tool for dispelling misconceptions and stereotypes commonly held about persons with disabilities. However, these authors warn against using information to create sympathetic feelings, as this may serve to reinforce negative stereotypes. Rather, information should highlight the capabilities and strengths of people with disabilities.

Information is often used in conjunction with direct contact with people with disabilities. Here, the assumption is that exposure to persons with disabilities will decrease the tension and discomfort experienced by many nondisabled persons in their presence (Westwood et al., 1981). Some researchers, investigating the effects of racial desegregation, have found that, in general, increased contact between different races leads to diminished prejudice (Amir, 1969). However, other evidence has suggested that increased racial contact can also reinforce prejudice, especially when members of an ethnic group choose to remain among their own kind rather than to integrate (Aronson, Blaney, Sikes, Stephan, & Snapp, 1975). Aronson et al. attempted to overcome this tendency to remain segregated by creating a "jigsaw classroom." The jigsaw method required a high level of cooperation among a group of students, so that only a strong team effort would accomplish a given task successfully. Although students in jigsaw classrooms came to like their peers more and generally improved their attitudes toward school, the method did not significantly reduce students' levels of prejudice (Aronson et al.).
Research investigating contact between different groups has suggested that more favorable results will be produced if the individuals in contact have equal status (Meyers, 1990). Donaldson (1980) has advocated equal status contact between the nondisabled and people with disabilities. The individuals in contact should be approximately the same age and have similar social, educational, and vocational status. In addition, it is important that the people with disabilities engaging in the contact do not exhibit stereotypical behaviors (i.e., demonstrate helplessness and hopelessness). Sandler and Robinson (1981), echoing the results of Aronson et al. (1975), suggest that contact is more effective when the various groups participate in rewarding activities with mutual goals. Additionally, the contact experience should be carefully controlled and structured (Donaldson, 1980), and should occur in an environment of equality and tolerance for individual differences (Sandler & Robinson, 1981).

Empirical studies have supported the concept that equal status contact improves attitudes toward persons with disabilities. Weinberg (1978) surveyed college students living in dormitories which were segregated (i.e., had no persons with disabilities as residents), integrated (i.e., had at least three resident individuals with physical disabilities per floor), or placed nondisabled students and students with disabilities together as roommates. Students living in the segregated dormitories, who had the least contact, viewed people with disabilities as less attractive, less happy, more self-controlled, and more dependent. Although students living in integrated dormitories had moderately more positive attitudes, those students actually sharing a room with a person with disabilities viewed the disabled as being most similar to them. Weinberg (1978) notes that as contact increases, perceived similarity increases, although a very intense contact situation was required to achieve a major change in attitudes in this study. More recently, Eichinger, Rizzo, and Sirotnik (1991) devised an intervention among college students in a special education class consisting of lectures, discussions, media presentations, and guest speakers with disabilities. The students also observed classes serving children with disabilities. The
results of this study suggest that the structured contact experiences had the most significant impact in promoting positive attitudes toward persons with disabilities (Eichinger et al.).

Yuker (1988b), in discussing the limitations of contact experiences, has argued that if nondisabled participants believe that an individual's disability is their most important characteristic, then exposure to persons with disabilities will most likely not result in a positive attitude change. Yuker's observation may explain why direct contact and information are more successful when used together (Shaver et al., 1989). Through the provision of accurate information about disabilities, including how many people with disabilities live full, productive lives, nondisabled people will have greater opportunities to move beyond the individual's limitations to see and appreciate the person as a whole.

Attitude change interventions using vicarious experience generally place participants in situations that potentially help them to experience what it is like to have disabilities (Shaver et al., 1989). The most common type of vicarious experience is disability simulation, where individuals live with a disabling condition for a period of time. The most successful simulation activities allow the participant to observe the reactions of nondisabled people, thereby gaining firsthand experience of the frustrations typically encountered by persons with disabilities (Donaldson, 1980). Additionally, disability simulations are more likely to be successful if the simulations are carried out realistically, and the role-player copes successfully with the task (Clunies-Ross & O'Meara, 1989). Although simulations run the risk of emphasizing the impairment as the most crucial element in the experience (French, 1992), they have the potential to showcase the unique abilities of persons with disabilities, including their ability to seek solutions, make changes, and improve the quality of their lives (Wright, 1978).

Simulations as Attitude Change Interventions

Attitude change interventions incorporating disability simulations have been used with a variety of populations and with differing degrees of success. These interventions
generally have taken one of three forms. In some cases, the simulation has been one component of a comprehensive attitude change intervention program, and is presented along with other strategies described above (e.g., information, contact with people with disabilities). In other cases, simulations have been the primary intervention, or directly compared against alternative approaches. The following review of the disability simulation literature will explore in detail each of the three forms these interventions have generally taken. Although the present study utilized college students as subjects exclusively, previous studies involving children will be reported to illustrate the breadth of the research and highlight some problems and limitations commonly found in the simulation literature.

The simulation research reviewed here presents with three major weaknesses which limit the conclusions that can be drawn from this body of work. First, many of these studies assume that disability simulations are interchangeable. Distinctions between different types of simulations are not always clearly defined, and qualitatively different simulations are often presented together. Different types of simulations, for example, an experience in a wheelchair or an experience walking while blindfolded, may provoke different responses and have varying effects on attitudes. It is naive to suggest that one simulation is as good as the next, or that two qualitatively different simulations will produce similar results. A second major weakness involves the methods used to measure attitude change. While many studies use an established instrument such as the ATDP, an equal number of studies use poorly researched, experimenter-derived attitude scales, which may or may not function as reliable and valid instruments. Some studies do not use objective scales at all, but rely on subjective self-reports or qualitative data exclusively. A third major weakness in the simulation literature is the lack of behavioral measures used to assess attitude change. Even though many studies report positive attitude change, there is little data to support the notion that improved attitudes correspond with improved behaviors toward people with disabilities. By not including behavioral measures, these
studies fail to prove that simulations actually enhance the treatment of persons with disabilities by the nondisabled.

In addition to these three major weaknesses, other problems include frequent lack of specific information describing the simulations used, poor control over the simulation experience by many researchers, and the tendency to allow participants to choose their preferred simulation. These criticisms of simulation studies strongly suggest that this type of research has been poorly and carelessly conducted, and point to the need for a well-designed study which addresses these critical flaws. The present experiment was designed to rectify the weaknesses which characterize much of the previous work in this field, weaknesses that are highlighted in the following review.

*Simulations as part of a comprehensive attitude change intervention program.* Many of the studies found in the literature have incorporated simulations as one part of a comprehensive attitude change intervention. Leyser, Cumblad, and Strickman (1986) designed the Learning About Handicaps Program, which focused on providing nondisabled elementary school children with information about a broad range of handicapping conditions, as well as attempting to promote positive attitudes. Disability simulation was one component along with direct contact, information, persuasive messages, and group discussions. Typical of much of the research in this area, the authors fail to describe the exact nature of the simulations. Attitude change was measured by a pretest - posttest administration of the ATDP. However, the authors scored the ATDP differently than is indicated by Yuker and Block (1986), and combined items from different versions of the scale rather than using one of the standard versions of the ATDP. It is unclear whether these changes to the instrument affected the results of this study. Leyser et al. found significant positive attitude change among the experimental group based on ATDP scores. Noting the limitations of this study, Leyser et al. recommend behaviorally validating the improved attitudes expressed through the ATDP in future studies.
Two other studies have used a combination of interventions including simulations to successfully improve the attitudes of elementary school children toward people with disabilities. Jones, Sowell, Jones, and Butler (1981) incorporated direct contact and simulation activities such as experience with wheelchairs, prostheses, and other orthopedic appliances, as well as the performance of routine activities and games while blindfolded. Jones et al. used an unstandardized children's attitude scale as the dependent measure. Clunies-Ross and O'Meara (1989) also used wheelchairs as part of simulation exercises, in addition to persuasive messages, group discussion, and direct contact with a peer group with disabilities. These authors used a standardized children's attitude scale as their dependent measure. Both of these studies demonstrated positive attitude change among the experimental groups.

Attitude change interventions using simulations along with other strategies have also been used successfully with high school students. Jacobson, Knox, Abramson, and Spilfogel (1983) designed an educational program on developmental disabilities which included information, persuasive messages, and simulations. The authors do not describe the specific simulations used in the study. Jacobson et al. found a significant positive attitude change in three of four experimental groups based on a pretest - posttest administration of the ATDP. Handlers and Austin (1982), also working with high school students, combined simulations along with information, student research on disabilities, persuasive messages, and direct contact with a blind peer. These authors did not use a standardized attitude scale to measure attitude change, but instead asked the students to respond to questions created by the teachers at their high school. Although 82% of the small sample in this study (n = 18) self-reported improved attitudes, it is unclear whether the students were being graded on their responses or had other ulterior motives for claiming improved attitudes.

Several studies have incorporated simulations into various college courses on disability. Rizzo and Vispoel (1992), working with undergraduate physical education majors, found
significant positive attitude change using a variety of interventions including simulations. The authors measured attitude change by administering their self-developed scale, The Physical Educator's Attitude Toward Teaching the Handicapped Questionnaire (PEATH-II). The specific aspects of the simulation activities are not described. Barrett and Pullo (1993) included a computer simulation of wheelchair usage and a three day continuous simulation of a severe physical disability (which was not monitored by the researchers) as part of a college course titled "The Handicapping Experience." The authors gathered data on 199 students with and without disabilities over a five year period using the ATDP as the dependent measure. Interestingly, significant positive attitude changes were demonstrated by the students without disabilities (n = 174), but not by the students with disabilities (n = 25). The effect that the three day simulation experience had on students' attitudes is difficult to determine. Since the experience was not monitored, it is unlikely that all participants performed the simulation as it was intended to be carried out by the authors. Another example of simulations used as part of a college course is reported by Pfeiffer (1989). Over a five year period, students enrolled in a disability studies class were asked to participate in a wheelchair simulation exercise which took place during class time. The wheelchair simulation activities included maneuvering in and out of an awkwardly accessible room, using a wheelchair lift, and riding in an elevator. Based upon a content analysis of journals written by 78 students, Pfeiffer reports that the simulation experience produced more than three times as many positive responses as opposed to negative responses. Although Pfeiffer's students were observed by the rest of the class while performing their wheelchair simulation, which confirms the active participation of all subjects, an obvious problem with this study is the method used for measuring attitude change. No standardized attitude scale or control group were used. Students' journals were included as part of their course grade, which may have influenced how the students described their reactions to the simulation. Finally, the author himself is a person with disabilities, which may also have biased the responses of his students.
Two studies reported in the literature using a variety of attitude change interventions with elementary school children failed to find significant results. Leyser and Price (1985), who used group simulations of disabilities as one component of their intervention, attributed their lack of significant findings to elevated pretest scores on the ATDP, as well as limited time devoted to the intervention. Miller, Armstrong, and Hagan (1981) also cite relatively brief interventions as a probable cause for lack of significance. Additionally, Miller et al.'s study may have been hampered by the limited sensitivity of the authors' self-developed attitude scale.

Simulations vs. alternative approaches. A second group of studies have compared simulations or vicarious experience of a disability against other attitude change interventions in an effort to determine which approach works best. Lipsky (1981) compared simulation of blindness against persuasive messages among two groups of elementary school children. The simulation group wore black eye coverings and performed manual tasks such as making a peanut butter and jelly sandwich. The persuasive message group watched a video intended to help children become sensitized to individual differences. Lipsky found the simulation group to have significant positive attitude change based on a pretest - posttest administration of the ATDP, while the persuasive message group actually demonstrated a negative attitude change. Salend and Moe (1983), also working with elementary school children, compared persuasive messages in the form of children's literature to persuasive messages combined with simulations, information, and group discussion. This study included simulations of hearing loss by watching TV without sound and simulations of blindness by attempting to identify sounds and smells while blindfolded. The dependent measure was a children's attitude checklist. The results obtained by Salend and Moe indicate a significant positive change among the simulation group only.

Fiedler and Simpson (1987) compared an intervention focusing on specific categories of exceptionalities or disabilities, such as mental retardation and sensory impairments,
against an intervention focusing on the broad, generic concepts of values, conformity, individual differences, and the effects of labeling. The categories of exceptionalities group received information about a specific disability, followed by discussion and simulation activities that illustrated the limitations of each exceptionality or disability. Specific descriptions of the simulations are not provided. Dependent measures were two attitude scales administered before and after the intervention. Fiedler and Simpson report that although both groups demonstrated significant positive attitude changes, the strongest attitude improvement occurred among the categories of exceptionalities group.

Ibrahim and Herr (1982) compared simulations to information plus persuasive messages among two groups of undergraduate college students. The simulation group role-played in pairs aspects of a specific disability from the area of speech pathology and audiology (e.g., stuttering, articulation problems). The information group was exposed to movies, a slide show, and written personal accounts of people with disabilities, followed by group discussion. Using the ATDP, Ibrahim and Herr found significant positive attitude change among both groups, with the simulation group showing the strongest positive change. Positive attitude change was still evident at a six week follow up.

A study by Wilson (1971) resulted in negative attitude change on the part of the simulation group. This group spent 2 1/2 hours participating in directed activities under conditions of simulated deafness. Wilson used wax, fiber ear plugs, and sound masking to simulate deafness. Subjects were required to interact with confederates who had full use of their hearing. A second experimental group observed communication in sign language between an undergraduate college woman with a hearing impairment and a graduate student. Posttesting on the ATDP revealed no significant differences between the two experimental groups and a no-treatment control group. However, on the Semantic Differential Scale (SDS) (Osgood, Suci, and Tannenbaum, 1957, as cited in Wilson, 1971), the simulation group rated the concept "persons who are deaf" significantly lower than the observation group, indicating a negative attitude change. It is unclear why a
negative attitude change was reflected on the SDS but not also on the ATDP. It could be that the participants' change in attitude was very subtle, so that a global measure such as the ATDP failed to record it while only one narrowly focused item on the SDS was sensitive to it. One interpretation of the negative attitude change indicated by the SDS is that the group simulating deafness became very frustrated by their experience, possibly because they were required to engage in cooperative tasks and discussion with individuals who had full use of their hearing. Since the tasks were structured in such a way that subjects had little chance of coping successfully with them, subjects may have reacted to their own perceived inability to perform adequately. The results of Wilson (1971) lend support to the conclusion of Chunies-Ross and O'Meara (1989) that effective simulations allow the role-player to cope successfully with the task.

**Simulations as the primary intervention.** A third group of studies have highlighted different forms of simulations as the primary strategy for attitude change toward persons with disabilities. Clore and Jeffery (1972) designed a disability simulation where one group of participants, known as the role players, were confined to a wheelchair. These individuals were required to travel in their wheelchair from the fourth floor of one building on a college campus to the basement of the student union, where they were to make a purchase at the cafeteria before returning to the starting point of the experiment. A second group of participants, known as the vicarious role players, were required to follow the role players on their journey at a distance of 20 feet, but were not allowed to interact with the role players. Both experimental groups demonstrated significant positive attitudes on an experimenter-derived attitude scale as compared to a no-treatment control group. Clore and Jeffery introduced a behavioral assessment component by asking participants to volunteer to provide a campus tour for a student with disabilities. However, the groups did not differ significantly regarding their tendencies to volunteer. The results of a disguised attitudinal follow-up conducted four months after the experiment indicated that both the role players and the observers were significantly more
positive than the controls in supporting increased facilities for persons with disabilities at their college. Clore and Jeffery's work represents one of the few attempts at conducting behavioral research on the effects of attitude change interventions toward people with disabilities.

More recently, Wurst and Wolford (1994) investigated the effects of simulating an auditory disability (using earplugs) and a visual disability (using light filtered glasses) among a group of undergraduate college students. Subjects were allowed to choose the simulation, and were not monitored by the authors during the experience. The results of the experimenter-derived assessment measures indicate that the subjects demonstrated limited positive attitude change. Although some subjects reported increased awareness and empathy toward persons with disabilities, they also indicated a largely negative reaction to the simulation exercises.

Dahl, Horsman, and Arkell (1978) designed a disability simulation program for 5th grade students. The students participated in the simulation of hearing, vision, coordination, and physical impairments. No differences were found based on a pretest posttest administration of the ATDP, and only one item on a social distance checklist dealing with attitudes toward people with physical disabilities was found to be significant. This study may be flawed because of the brief intervention period (only ten minutes were devoted to each simulation activity). A much longer intervention period was used by Sawyer and Clark (1980). Participants were graduate students majoring in rehabilitation who were assigned a specific disability simulation: impaired hearing using earplugs, blindness using flesh-tone pads worn under sunglasses, immobilization of the dominant arm, or paraplegia using a wheelchair. The study participants were required to live with their assigned disability for a 24 hour period, but were not monitored by the experimenters. Three of the ten items on the Semantic Differential Scale (Osgood et al., 1957, as cited in Sawyer and Clark) were found to be significant ("my thoughts about handicapped persons," "my body image as a handicapped person," and "people who are
blind."). Sawyer and Clark suggest that the subjects received the greatest impact from environmental factors, including both physical barriers and the reactions of others.

Wilson and Alcorn (1969), working with college students, allowed their subjects to choose which disability they were to simulate. Participants chose either blindness (opaque bandages placed over the eyes), deafness (using earplugs), or the loss of their dominant hand (which was secured to their body, or placed inside a box or can and taped over). Although participants were required to simulate their chosen disability for eight hours, they were not observed during this time. No significant differences were found based on a pretest-posttest administration of the ATDP. Wilson and Alcorn cite probable reasons for the lack of significant results, including a lack of sensitivity of the ATDP, and the fact that the study participants were allowed to choose a disability simulation that placed the least restrictions on them. Additionally, the participants were not monitored to ensure their compliance with the experimental tasks. This study is indicative of the types of methodological problems pervasive in attitude change research using vicarious experience.

**Articles suggesting simulation activities.** Glazzard (1979) outlined three simulation activities used with graduate students in special education to increase their awareness of disabilities. Simulation of hearing impairments was accomplished through earplugs. Students were required to wear the earplugs for 3 hours while eating in a restaurant, shopping, or talking to friends. Simulation of orthopedic handicaps required students to maneuver a wheelchair from their classroom to the elevator. The students were then to use a pay telephone, a drinking fountain, and a restroom while confined to the wheelchair. Simulation of visual impairments required students to wear a blindfold at home while eating, getting dressed, and locating items around their home. Excerpts from students' reports indicate feelings of frustration, helplessness, and anxiety concerning others' reactions to them. Israelson (1980) outlined suggestions for simulations of some of the same disabilities described by Glazzard (1979). Israelson's subjects were seven and eight year old hearing impaired children. The children were provided with cardboard glasses
that simulated a variety of visual impairments, including tunnel vision, one sided blindness, and peripheral vision. Later, the children were blindfolded and required to walk an obstacle course set up in their classroom. The children navigated the obstacle course with and without a cane, and with and without a sighted friend guiding them. Finally, the children played an object identification game while blindfolded with food and toys.

Orthopedic disabilities were simulated by incapacitating each child's dominant hand. The children then participated in their normal routine, including eating lunch, writing in class, and putting on coats at the end of the day. Each child also spent time sitting in a wheelchair. Israelson noted that even though her students were hearing impaired, they still held negative attitudes toward peers who presented with multiple disabilities. These activities helped to increase the children's awareness of what their more severely disabled peers experienced.

Dewar (1982) outlined the Child Awareness Program, an intervention designed to ease the transition of elementary school students with disabilities into regular classrooms. Dewar suggests that the simulations used as part of the program had the greatest impact on the students. Examples of the simulations included navigating an obstacle course while seated in a wheelchair, walking while blindfolded with the aid of a cane, using crutches, and wearing mittens while attempting to write. According to Dewar, this program was successful at increasing both students and teachers acceptance of persons with disabilities.

Wesson and Mandell (1989) have suggested that simulations can help nondisabled people to develop an awareness of how persons with disabilities learn to adapt and cope, thereby creating an environment for better relations between the two groups. Based upon a review of several studies which successfully used simulations to improve attitudes, Wesson and Mandell outlined general guidelines for simulations. The simulation must be as realistic an experience as possible and designed to be repeated a minimum of four times. Clear and practical written directions need to be provided. In addition, an observer should watch the person experiencing the simulation, participants should write about and discuss
their experience, and the observer should document their experience as well. Wesson & Mandell suggest specific simulation activities to be used with grade school and high school children, including toothbrushing while blindfolded and dressing with hands covered (e.g., tube socks covering the hands).

**Theoretical Bases for Attitude Change**

Consistency theories of attitudes provide a useful framework for interpreting attitude changes resulting from participation in disability simulations. Consistency theories assume that individuals have a basic need to maintain agreement between various attitudes and/or behaviors (Keisler, Collins, & Miller, 1969). Heider's (1958) balance theory proposes that people have a tendency to prefer balanced states in which their attitudes toward other persons or things are all positive or all negative. When attitudes toward a specific object take on both positive and negative qualities an imbalanced state is produced, which is presumed to be unstable and to create psychological tension which motivates the individual to change the situation in some way. Simulations have the potential to create an imbalanced state by exposing participants to new experiences and situations which may challenge their attitudes toward disability and persons with disabilities. For example, simulations may help nondisabled individuals to develop an awareness of how people with disabilities learn to adopt and cope (Wesson & Mandell, 1989), and may demonstrate similarities between people with and without disabilities (Wright, 1983). These new insights gained through simulation experiences can potentially create an imbalanced state if they contradict previously held negative attitudes, and may lead to a positive attitude change.

Festinger's (1957) theory of cognitive dissonance is another type of consistency theory that is applicable to disability simulations. Cognitive dissonance proposes that individuals hold cognitions, which may be beliefs, opinions, or attitudes, about themselves and their surroundings. Dissonance occurs when a person simultaneously holds two cognitions that are psychologically inconsistent. Since dissonance is presumed to be unpleasant, the
individual is motivated to reduce dissonance by changing cognitions, adding new cognitions, or changing behavior. Dissonance theory was revolutionary in proposing that changing one's behavior can in turn modify one's attitude (Oskamp, 1977). Cognitive dissonance is particularly relevant to simulations because it describes the influence of behavior on attitudes. Simulations change an individual's behavior by placing him or her into a novel situation. The individual, perhaps for the first time, is exposed to the experience of life with a disability, becomes familiar with the equipment used by some persons with disabilities (i.e., wheelchairs and crutches), and may begin to understand and appreciate the positive and negative social, emotional, and environmental aspects of disability (Wright, 1978). The new behaviors exhibited by simulation participants may expose them to experiences that contradict negatively held attitudes toward disability, thereby creating dissonance. The individual would then be motivated to reduce the dissonance, which could be accomplished through a change of attitude.

Active participation through the use of role playing has been shown to modify individuals' attitudes (Oskamp, 1977). Role play involves acting out the behaviors and feelings another person might display in a given situation (Oskamp). Several disability simulation studies which emphasized the emotional aspects of role play have reported significant attitude changes among the participants (Clore & Jeffery, 1972; Ibrahim & Herr, 1982). Well designed simulation experiments using a role play approach have the potential to influence the participants to experience the cognitive, affective, and moral conflicts of disability by taking the perspective of persons with disabilities (Kiger, 1992). The effects of role play can be interpreted in terms of cognitive dissonance, in which changing a person's behavior and exposing them to new cognitive and affective perspectives can help to create dissonance between these new experiences and previously held negative attitudes. The dissonance occurring as a result of the simulation may lead to attitude change.
Limitations and Criticisms of the Existing Research

Attitude change interventions using disability simulations have been criticized on ethical, methodological, and theoretical grounds (Kiger, 1992). Kappan (1994), from an ethical standpoint, has argued that some simulations, particularly those that simulate blindness, run the risk of causing physical harm to the participants. Kiger has noted the additional possibility of psychological harm, including stress and anxiety, stemming from frustrations encountered in difficult simulation exercises. When simulations occur in a group setting such as a classroom, individuals may be pressured and coerced to take part in the experience. Group simulations also involve risks to the participants' confidentiality (Kiger).

In the present study, the rights of subjects were protected through strict adherence to the guidelines found in the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct (APA, 1992). The procedures used in this study were approved by the university's Institutional Review Board (IRB). All individuals participated on a voluntary basis with informed consent. Potential problems arising from large group simulations were avoided by running participants individually. All persons who took part in the simulations received an orientation where they were instructed regarding the safe use of the wheelchair or the crutches, and were allowed time to practice using these devices prior to performing the simulation. Finally, the simulation task itself did not pose any significant safety threats to the study participants.

An additional ethical problem raised by critics of simulations is that these studies create a false impression of disability (French, 1992; Kappan, 1994). Simulations may encourage pity and the devaluation of persons with disabilities while ignoring their coping strategies, efforts to change the environment, and life satisfactions (Wright, 1978). Activities that are challenging for nondisabled people simulating a disability are typically not difficult for persons with disabilities, which can create the impression that individuals with disabilities are both superhuman and helpless (French). Also, simulations tend to individualize
disability by focusing only on the impairment (French). Simulations which adhere to the medical model teach about dependency and may reinforce harmful attitudes about disability (Pfeiffer, 1989). Participants who become frustrated with the simulation tasks may project their negative feelings from the simulation onto persons with disabilities (Wright). Feelings of empathy may be minimized because participants realize their condition is only temporary (French).

The present study addressed the above criticism that simulations tend to focus strictly on the imposed impairment by incorporating a coping framework, proposed by Wright (1978), into the design. Before beginning the simulation exercise, participants were instructed to pay attention to possible changes in the physical environment, as well as personal changes that could better help them to adapt to and cope with life as a person with disabilities. By orienting the participants to be problem solvers, the abilities of persons with disabilities to act assertively and make positive changes was highlighted. The coping framework and the role play component, where subjects were asked to play the role of a recently disabled college student, helped the participants to view persons with disabilities as real people with strengths and weaknesses similar to their own.

Many of the studies reported in the literature investigating disability simulations contain serious methodological flaws. Three major weaknesses commonly found in the simulation literature were described earlier in this chapter. These weaknesses include an assumption that simulations are interchangeable, problems associated with the dependent variables measuring attitudes, and the lack of behavioral assessment of attitude change. Additional problems with many of the studies include a lack of specific information regarding the simulations used and the types of activities that took place under conditions of simulated disability. This lack of information makes it difficult to evaluate the effectiveness of the research (Kiger, 1992). An obvious problem with several studies is the lack of control over the simulation experience. When participants are not monitored while engaging in the simulation, there is little evidence to support the quality of the experience or the
amount of time actually devoted to it (Donaldson, 1980). Some researchers have allowed
subjects to choose their preferred simulation activity rather than assigning it, thereby
providing participants the luxury of experiencing the disability which is least threatening to
them. Many attitude change intervention studies have used a combination of approaches,
making it difficult to determine what impact the simulation experience had on the overall
results. Kiger has commented on the problems associated with using attitude scales as
dependent measures. In some cases, attitude scales do not change following a simulation
even when subjects qualitatively report that the experience was meaningful to them. A
behavioral measure of attitudes would be most valuable because subjects' actions toward
people with disabilities are a more powerful reflection of their attitudes as compared to
their responses on a paper-and-pencil scale. Unfortunately, only one study in the
simulation literature attempted to use a behavioral dependent variable (Clore & Jeffery,
1972), with non-significant results.

These methodological criticisms of simulation studies were addressed by the present
study in several ways. Information regarding the specific aspects of the wheelchair and
crutches simulations has been reported in detail in this study. Participants were not
allowed to choose their preferred activity, but were instead randomly assigned to the
treatments. All subjects participating in a simulation were monitored by the researcher to
ensure their compliance. The simulations in this study were not used interchangeably.
Rather, one distinct simulation, an experience in a wheelchair, was compared against a
second distinct simulation, an experience on crutches. While this experiment did use an
attitude scale (ATDP - Form A), additional information was obtained through the use of
the disability interest questionnaire (DIQ). The DIQ, which was based on the work of
Clore and Jeffery (1972), was used as the behavioral dependent measure in this study.
Participants were presented with a realistic scenario and asked to volunteer their time in
activities related to persons with disabilities on their college campus. Finally, qualitative
data, gathered through interviews following the completion of the simulation experience, was also obtained.

Another major criticism is that disability simulation studies often lack a solid theoretical model (Donaldson, 1980). A high percentage of studies make no mention whatsoever regarding theories of attitudes or attitude change. While several studies have used the technique of role play to presumably increase emotional involvement and create dissonance leading to positive attitude change among the participants, Kiger (1992) argues that simulations can just as easily reinforce negative attitudes. Even if simulations can successfully lead participants to identify with people with disabilities, they do not address other factors such as common goals and intergroup contact between persons with and without disabilities. Due to the narrow scope of simulations, their ability to significantly change attitudes may be limited (Kiger).

In the present study, cognitive dissonance (Festinger, 1957) has been used as the theoretical model of attitude change stemming from participation in a disability simulation exercise. While Kiger's (1992) contention that simulations are limited in scope may be valid, this study expanded the narrow boundaries of simulation exercises commonly found in the literature. Certainly, no one method of attitude change has been found to be effective for all people in all situations. However, simulation experiences, if properly planned and carried out, have the potential to be an important means of sensitizing nondisabled individuals to the lifestyles of persons with disabilities.
Chapter III

METHODOLOGY

This chapter presents the procedures that were employed in conducting this study. Under the heading "Participants," the general characteristics of study participants are reported along with ethical and design considerations that were used in subject selection. In the section entitled "Instruments," descriptions of each study instrument, as well as reliability and validity information where appropriate, are provided under the separate subheadings "Attitudes Toward Disabled Persons Scale" and "Disability Interest Questionnaire." The next section, entitled "Materials and Equipment," provides descriptions of the hardware that was used in the disability simulations under the separate subheadings "Wheelchair" and "Crutches." Under the heading "Procedures," information is reported pertaining to the recruitment of subjects and group assignments. Also reported in this section is a description of the tasks each group had to carry out, along with the methods that were utilized to collect data. This section is followed by the "Hypotheses and Statistical Analyses" section which first discusses problems inherent in attempting to determine changes in subjects over time under the separate subheading "The Measurement of Change," then lists the four major study hypotheses and provides a description of the statistical procedures employed in testing each hypothesis.

Participants

The individuals who participated in this study were undergraduate college students at a private university in the northeast. The investigator followed guidelines put forward by
the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct (APA, 1992) with regard to treatment of the study participants. Individuals retained the right to decline study participation or to withdraw from the research at any time. Therefore, those who chose to participate in the study did so on a voluntary basis with informed consent. This experiment was approved by the university's IRB.

The researcher recruited a total of 60 participants. Due to the nature of the research, undergraduate students in psychology classes were considered appropriate for participation. These students were selected because many of them may eventually work in areas where they will come in contact with people with disabilities and their families. The attitudes of these future professionals toward persons with disabilities may have a profound impact on the individuals whom they will serve. Altman (1981) agrees that persons with disabilities can be strongly affected by the attitudes of professionals who control services, jobs, and opportunities. After securing the cooperation of the instructors, the investigator made presentations in various undergraduate introductory psychology classes at the university to recruit subjects. Individuals who participated in this study received extra credit in their courses.

Instruments

**Attitudes Toward Disabled Persons Scale - Form A (ATDP - Form A; Yuker & Block, 1986)**

The ATDP (see Appendix A) was originally created in the late 1950's by Harold E. Yuker and his associates. The ATDP was unique in that it was the first scale designed to measure global attitudes toward people with disabilities, rather than toward individuals with a specific type of disability. The scale was constructed to measure the attitudes of nondisabled individuals toward people with disabilities, as well as attitudes of individuals with disabilities toward themselves and others like them. Yuker and Block (1986) state the major assumption underlying the ATDP is that people with disabilities are sometimes
perceived as being different from or inferior to nondisabled persons. The scale attempts to
measure the degree to which people with disabilities are viewed as "stereotypic members
of an outgroup" (Yuker & Block, 1986, page 18).

The ATDP is a paper and pencil inventory consisting of statements about persons with
disabilities (e.g., "disabled people are often unfriendly," "disabled people are usually more
sensitive than other people"). Respondents indicate their level of agreement or
disagreement with each statement using a six-point Likert-type scale. Response
alternatives range from "I agree very much" (scored as +3) to "I disagree very much"
(scored as -3). There are three alternate forms of the scale; Form O contains 20 items,
while Form A and Form B each contain 30 items. Scores on the ATDP can range from 0
to 120 (Form O), and from 0 to 180 (Forms A and B). Scoring the ATDP involves first
reversing the sign from positive to negative, or from negative to positive, on some of the
items. On the ATDP - Form A, the signs must be changed on items 5, 9, 12, 14, 17, 19,
21, 22, 23, 24, 25, and 29 prior to scoring. Following this, items with positive values are
added together. Items with negative values are then summed and subtracted from the
total score of the positive values. The sign of this resulting number is then reversed, and a
constant of +90 is added to eliminate negative values (Yuker & Block, 1986).

Yuker and Block (1986) state that the three versions of the ATDP are equivalent and
can be used interchangeably. Reliability and validity data discussed below support their
claim. In this study, the ATDP - Form A was selected to be used as a pretest and a
posttest instrument simply to maintain the consistency of the experiment. Regarding
interpretations of scores, Yuker and Block (1986) suggest that higher scores indicate
positive, accepting attitudes, while lower scores imply negative, rejecting attitudes. The
scores also reflect the degree of perceived similarity between the respondent and
individuals with disabilities, with higher scores suggesting greater similarity. Lower scores
can be interpreted as implying negative attitudes. Since 90 is the midpoint of the scale, an
individual who scores 90 can be described as having ambivalent attitudes toward people
with disabilities. Scores above or below 90 point to more positive or more negative attitudes, respectively.

Yufer and Block (1986) report a large number of studies assessing the ATDP's reliability. For Form A, test-retest reliability (3 weeks or less) has ranged from .74 to .91, split half reliability has ranged from .73 to .89, and alpha reliability (a measure of the internal consistency of a test) has fallen between .83 to .85. For Form B, test-retest reliability (6 weeks or less) has ranged from .83 to .85, split half reliability has ranged from .72 to .91, and alpha reliability has fallen between .79 to .89. The construct validity of the ATDP was assessed by determining the strength of the relationship between the scale and other relevant variables. For example, the ATDP was found to correlate with the Acceptance of Disability Scale (Linkowski, 1969, as reported in Yufer & Block, 1986) within the range .55 to .78. Scores on the ATDP have been found to correlate with scores on other instruments assessing related attitudes. The strongest positive correlations have been found with attitudes toward mainstreaming (.47) and prejudice/ethnocentrism (.43). Yufer and Block suggest that the relatively high correlations between the ATDP and measures of prejudice/ethnocentrism and attitudes toward mainstreaming provides evidence that this instrument reflects prejudiced attitudes, and is a valid measure for assessing attitudes toward people with disabilities.

Information provided in Yufer and Block (1986) lists scores obtained on the ATDP - Form A among a variety of groups. A 1981 study assessed the attitudes of quadriplegics (n = 25), who scored a mean of 109, and paraplegics (n = 25), who scored a mean of 118. A 1977 study which measured the attitudes of 235 rehabilitation personnel reported an average score of 123.2. Eighth graders (n = 101) displayed a score of 92.7 in 1983, while 6th, 9th, and 12th graders (n = 195) displayed a score of 118.8 in 1980. Undergraduate college students scored an average of 122.9 in 1974 (n = 179), and an average of 130 in 1978 (n = 52). Finally, graduate students in psychology displayed a mean score of 127 in 1986 (n = 55).
Although the ATDP remains the most widely used instrument for assessing attitudes toward persons with disabilities, its continuing relevance has been questioned by a number of researchers (Makas, Finnerty-Fried, Sigafos, & Reiss, 1988). Antonak (1980) found a pronounced tendency to select the most extreme responses (i.e. +3 or -3) to six ATDP Form O items among a sample of 326 college students, which may reflect social desirability or the influence of "political correctness" on attitudes (Makas et al.). Although some studies have reported that the ATDP is not susceptible to faking (Speakman & Hoffman, 1979; Yuker, Block, & Young, 1966), other studies suggest that scores on the ATDP can be artificially distorted under certain conditions (Vargo & Semple, 1984). Yuker (1986) cautioned against using the ATDP as a screening device, but instead recommended its continued use in research situations where there is little incentive for subjects to fake their responses. However, in a study using the Issues in Disability Scale (IDS; Makas et al.), which contains several items borrowed from the ATDP, Makas (1990) demonstrated that instructing respondents to "fake good" did not automatically result in higher scores. The results found by Makas suggest that some attitudes perceived as positive by the nondisabled may actually come across as negative and demeaning to persons with disabilities.

Another source of controversy regarding the ATDP has been the ongoing debate over exactly what the scale measures. Yuker and Block (1986) have indicated that the ATDP is composed of two types of items. One type implies that persons with disabilities differ from nondisabled people on certain behavioral and emotional characteristics, while the second type implies that persons with disabilities should be treated differently than persons who are not disabled. However, Yuker and Block conclude that these two types of items are not independent factors, but instead are highly correlated and together contribute to the total score. The authors of the scale, therefore, view the ATDP as a unidimensional measure reflecting perceived differences between people with disabilities and nondisabled individuals. In contrast to this view, Antonak's (1980) factor analysis of the ATDP Form
O suggests the scale is composed of two distinct factors, which he labeled social-compassion and personal-insecurity. The results of Antonak's (1980) multidimensional model are similar to an earlier study by Siller and Chipman (1964), where the two derived factors were labeled hypersensitive-depressed and benevolent-inferiority. Other factor analyses of the ATDP have found as many as nine factors comprising the scale. On the other hand, Makas et. al. (1988) criticized the ATDP for being too narrowly focused and insensitive to certain dimensions of attitudes toward people with disabilities, including affective components, social distancing, and attitudes toward the civil rights of persons with disabilities. Yuker and Block point out that the results of the various factor analysis studies seem to be dependent upon the sample and the statistical procedure used, and suggest that the overall score provided by the ATDP should best be interpreted as a global attitude measure.

The ATDP has also been criticized for lacking behavioral validation (Makas et al., 1988). Yuker and Block (1986) do not provide any evidence that positive attitudes toward people with disabilities, as measured by the ATDP, are related to positive behaviors or actions toward persons with disabilities. Although few researchers have attempted to use the ATDP to predict behavior, Wesolowski and Deichmann (1980) found that high scoring and low scoring groups of subjects on the ATDP displayed significantly different galvanic skin responses (GSR's) when viewing videotapes of persons with disabilities. While this study suggests that the ATDP has the ability to differentiate the behaviors of high and low scorers, additional evidence is needed to support this claim.

While it is clear that the ATDP possesses significant limitations, it continues to be appropriately used as a generic, unidimensional attitude scale (Patrick, 1987). The fact that the ATDP is a standardized instrument, with acceptable levels of reliability and validity, makes this scale a useful tool, particularly in research situations, for measuring attitudes toward persons with disabilities (Furnham & Pendred, 1983; Yuker, 1986).
Disability Interest Questionnaire

The disability interest questionnaire (DIQ; see Appendix B) was customized specifically for this study and used as the behavioral dependent variable. The DIQ was inspired by Clore and Jeffery's (1972) disability simulation experiment in which subjects were asked to volunteer their time by providing a campus tour to a student who was disabled. In the present study, subjects were asked to respond to two questions that assessed their willingness to participate in future activities related to persons with disabilities. Each participant was asked to respond either yes or no to two questions:

1. I would be interested in attending a focus group at the university involving ways to improve facilities for people with disabilities on campus.

2. I would be interested in volunteering to provide prospective students with disabilities with an hour tour of the campus.

Students who answered "yes" to either question were invited to write down their name and telephone number. Participants compiled a score of between 0 and 3 based upon their responses to the DIQ. One point was awarded for each "yes" response, while an additional point was given for indicating their name and telephone number.

The rationale behind the use of the DIQ was to gather data that was more reflective of subjects' actual behavior toward people with disabilities. Participants were presented with two realistic scenarios that provided opportunities to hear and discuss issues related to people with disabilities, or to come in contact with a person with disabilities on their college campus. Asking participants who replied "yes" to either of these choices to indicate their name and telephone number was an additional way of assessing their commitment to become involved in these activities. Because this instrument was designed to assess the behavioral component of subjects' attitudes, it was hypothesized that those participants who scored relatively high on the ATDP would also score high on the DIQ.
Materials and Equipment

Wheelchair

The wheelchair used in this study was a standard manually propelled model manufactured by Everest and Jennings. The wheelchair was capable of being propelled by its occupant by gripping and turning the wheels. Before beginning the actual simulation experience, subjects received an orientation where they were instructed regarding wheelchair safety and appropriate techniques for mobility and maneuvering while seated in the wheelchair. Participants then practiced maneuvering the wheelchair in the psychology lab. Participants were allowed to begin the disability simulation only after they indicated to the investigator that they felt comfortable moving about in the wheelchair.

Crutches

The crutches used in this study were a standard wooden type typically found in a hospital setting. Each crutch had rubber padding at the base to prevent sliding or slipping, on the hand grips, and on the upper surface of the crutch which fits under the arm. Each crutch was capable of being adjusted at the handgrips and at the base. The investigator adjusted the crutches to comfortably conform to each subject. Participants received an orientation where they were instructed on appropriate techniques for mobility and maneuvering while using the crutches. Information regarding the proper fitting of the crutch and crutch gaits was taken from Maker, Salmond, and Pellino (1994). Participants then practiced maneuvering on crutches in the psychology lab. Participants were allowed to begin the disability simulation only after they indicated to the researcher that they felt comfortable moving about using the crutches.
Procedures

Recruitment of Participants

The researcher made presentations in various undergraduate introductory psychology classes at the university during the Fall 1996 and Spring 1997 semesters. Course instructors were consulted beforehand to determine the suitability of the class for participation in this research. During the presentations, the researcher first obtained informed consents and then administered the ATDP - Form A to the entire class, which constituted the pretest data for those students who chose to participate in the actual experiment. Although most of the class completed the ATDP, some of the students were administered a dummy attitude scale which was randomly mixed in among the ATDP's. The dummy attitude scale was constructed specifically for this experiment and designed to resemble the ATDP in appearance. However, rather than assessing attitudes toward people with disabilities, the dummy attitude scale asked questions related to attitudes toward psychology (e.g., "I am considering majoring in psychology," "studying psychology is boring"). Students' responses on the dummy scale were not scored or used in the data analysis. The purpose of having some students complete a non-ATDP dummy scale was to create a control group who did not receive the ATDP as a pretest.

During the pretesting sessions, students were asked to generate a unique code based on personal information which they wrote on their data sheets. Specifically, students were asked to write on their test protocols the following five pieces of information: the last letter of their first name, the first letter of their mother's maiden name, the month of their birth, the second letter of their first name, and the day of the month of their birthday. This unique code was used at a later time to match subjects to their previously completed ATDP or dummy attitude scale.

The researcher circulated sign-up sheets during the pretesting sessions inviting students to participate in the second part of the experiment. The researcher gave a brief description of the experiment and informed students that they would receive extra credit in their class
for taking part. Students who signed-up were called by the researcher at a later time and scheduled an appointment. Students were asked to report to the psychology lab, and told that the total time required for the experiment would be approximately 60 minutes.

**Experimental Design**

The design used for this experiment was a split-plot factorial 22.2 design with repeated measures (Kirk, 1982). There were two between-subjects factors (wheelchair simulation vs. crutches simulation; observation vs. no observation), and one within-subjects factor (subjects' attitudes as measured by the ATDP at pretest and posttest).

Forty participants were randomly assigned to one of four experimental groups, each group containing 10 members:

Group 1. These individuals participated in a disability simulation using a wheelchair. They were informed that the researcher would be observing them during their simulation experience.

Group 2. These individuals participated in a disability simulation using a wheelchair. They were not informed that the researcher would be observing them during their simulation experience. Despite the lack of informed observation for this group, these individuals were inconspicuously observed to ensure that they complied with the tasks of the experiment.

Group 3. These individuals participated in a disability simulation using crutches. They were informed that the researcher would be observing them during their simulation experience.

Group 4. These individuals participated in a disability simulation using crutches. They were not informed that the researcher would be observing them during their simulation experience. Again, this group was inconspicuously observed to ensure their compliance with the tasks of the experiment.

In addition to the four experimental groups, two control groups, each containing 10 members were used:
1. Control Group A: These individuals were pretested and posttested on the ATDP - Form A. However, they did not participate in a disability simulation experience.

2. Control Group B: These individuals were posttested only on the ATDP - Form A. The purpose of this second control group was to determine the pretest sensitization effects of the ATDP.

**Description of Tasks**

Each participant was first asked to read and sign an informed consent form. While subjects were reading the consent form, the researcher asked that they again generate the unique code that they had previously written on their pretest. The researcher read the instructions for the code and collected the information on a small slip of paper. The researcher then compared the participant's code to a list of codes taken from those students who were administered the dummy test as a pretest. If the participant's code matched one of the codes on this list, the individual was considered a member of Control Group B (posttest only group), and immediately administered the ATDP - Form A and the DIQ. If the participant's code was not a match, they were randomly assigned to one of the other five groups. Participants who were randomly assigned to one of these experimental groups were then read printed instructions describing the tasks of the study and the role the subject was being asked to play. The researcher read the instructions aloud, and subjects were encouraged to ask questions at any point. Participants were provided with additional opportunities to ask for clarifications before the disability simulation experience began.

The printed instructions for Group 1 (wheelchair simulation with informed observation) were as follows:

In this experiment, you are being asked to use your imagination and play the role of a student who has sustained serious injuries resulting from an automobile accident. Your injuries have resulted in you becoming totally paralyzed from the waist down, and you must now use a wheelchair to move about. Imagine that
today is your first day back on campus. Before heading to class, you decide to take a brief tour of the campus. The route you will follow will begin right outside McQuaid Hall. Proceed straight ahead toward the green, staying on the sidewalk. As you pass the entrance to the chapel, you will notice a brown and white bench on your left. Make a left past the bench and cross the road on to the green. Proceed across the green to the stone at its' center. From here, bear to the right and follow the middle path across the green leading to the traffic gate. Cross the road once again to Mooney Hall near the traffic gate. Bear to the right and follow the sidewalk past Mooney and Presidents Hall, and come back to where you started outside McQuaid Hall. I will provide you with a map of this route.

As you experience traveling the campus in a wheelchair for the first time, keep these questions in mind:

1. What changes in the physical environment would benefit me the most?
2. What changes do I personally need to make to better adapt to my situation?
3. What social and personal events during my brief campus tour have I found helpful or not helpful? How do others respond to me? How do I feel about myself right now?

While you tour the campus in the wheelchair, I will be observing you, although I won't talk or interact with you in any way. Should you happen to meet friends along the way, please tell them that you are participating in an experiment and will explain later.

Before we get started, I want you to take a few minutes and become familiar with using this wheelchair. Do you have any questions?

The printed instructions for Group 2 (wheelchair simulation without informed observation) were identical to those above, except that no mention was made about the participants being observed. The instructions for Groups 3 and 4 (crutches simulation with and without informed observation) were also similar to those above, except that these
groups were asked to imagine having to use crutches to ambulate. Groups 3 and 4 were asked to follow the same route as the subjects in Groups 1 and 2. Group 3 was informed that they would be observed by the researcher during their simulation experience, while Group 4 was not. Individuals randomly assigned to Control Group A (pretest-posttest with no disability simulation) and Control Group B (posttest-only with no disability simulation) were not exposed to these instructions and did not engage in any form of disability simulation.

Upon completing the disability simulation experience, participants in Groups 1-4 were given two instruments to fill out, the ATDP - Form A (as a posttest) and the disability interest questionnaire (DIQ). After completing these measures, participants were interviewed by the researcher. During this interview, special attention was paid to the three questions posed to the participants in the instructions (i.e., environmental and personal changes, positive and negative social and personal events). The researcher helped the participants to articulate their emotional reactions to the simulation experience. Control Groups A and B were not interviewed, but simply asked to complete the two instruments.

Some study participants expressed strong reactions to the simulation experience, ranging from mild annoyance to more intense anger and frustration. The researcher addressed subjects' negative responses during the post-simulation interview, and fully explained the study's rationale during the debriefing process. The researcher acted as a counselor for those individuals who voiced negative responses, helping them to explore and express their feelings and using empathy to validate their reactions. During the debriefing, subjects' negative responses were interpreted in terms of their imposed disability, such as feeling stigmatized and helpless while seated in the wheelchair. The rationale of disability simulations as a method for improving attitudes was explained. The researcher attempted to ensure that all participants gained insight into their reactions, and understood what the study was about. No participant left the psychology lab in a
distressed state. Subjects were given written receipts confirming their participation in the research study to assure that they received extra credit in their courses. Finally, subjects were thanked for their involvement in the experiment.

Several individuals who initially agreed to participate in this study declined to complete the disability simulation. These individuals were excused, and the data collected from them was discarded. These individuals were replaced with additional volunteers, so that a total of 60 subjects participated in the study. The researcher's observation confirmed that all participants adequately completed their assigned disability simulation.

Data Collection

All participants in Group 1-4 and Control Group A were pretested on the ATDP - Form A prior to the actual experiment. Individuals in Control Group B were not pretested on the ATDP, but instead administered a dummy attitude scale which was not used in the analysis. Those individuals in Groups 1-4 who completed the simulation were posttested on the ATDP and also filled out the disability interest questionnaire (DIQ). Subjects in Control Groups A and B were also posttested on the ATDP - Form A and the DIQ, but did not participate in a disability simulation.

The Measurement of Change

This research project, like many others in the social sciences, has attempted to measure changes in individuals who have been exposed to the experimental treatments. Specifically, this study considered changes in attitudes toward persons with disabilities as the result of participating in a disability simulation experience.

The measurement of change has long been a controversial topic in psychological research. Cronbach and Furby (1970) warn against the use of "raw gain" scores in pretest-posttest experiments, since these scores are strongly affected by random errors of measurement. Use of the raw gain score (posttest minus pretest) as the unit of change presents with several serious threats to experimental validity, including the effects of
regression toward the mean and the concept of the ceiling effect (i.e., those subjects who score high on the pretest have a limited range to improve their score at posttest) (Borg & Gall, 1989). In addition, gain scores imply that there is equal distance between scores throughout the entire score range of a particular instrument (Borg & Gall). In the present study, no such assumption regarding equal intervals between scores on the ATDP - Form A can be made. Repeated measures analysis of variance is one statistical procedure designed to overcome some of the limitations inherent in the measurement of change. In repeated measures designs, subjects act as their own controls, which reduces the amount of error in data analysis (Pedhazur, 1982). Limitations of repeated measures designs include the effects of the pretest on the experimental treatments and the posttest (i.e. carry-over effects, pretest sensitization), and the strict statistical conditions which must be met if the analysis of variance is to be considered valid (Pedhazur). Several researchers have addressed potential statistical problems and have suggested specific procedures to be followed when analyzing data from repeated measures designs (Barcikowski & Robey, 1984; Looney & Stanley, 1989).

In this study, a repeated measures analysis of variance, included in the 2 x 2 x 2 mixed-design factorial ANOVA (fully described in Chapter 4), was used to determine if an overall significant difference existed between pretest and posttest ATDP scores. The effects of pretest sensitization were assessed through the use of two control groups, one of which received both pretest and posttest while the other received posttest only. In addition, the effects of pretest sensitization were minimized by allowing a period of time from three to ten weeks to elapse between the administration of the pretest and participation in the experimental treatment. Finally, a second instrument, the D1Q was administered at posttest only, providing information that was not at all affected by pretest sensitization.
Hypotheses and Statistical Analyses

1. Nondisabled college students participating in a disability simulation experience will demonstrate significantly greater positive attitudes, as measured by the ATDP - Form A, than nondisabled college students participating in a no-treatment control group.

The independent variable, disability simulation, has two levels: (a) subjects who participated in a simulation, and (b) subjects who did not participate in a simulation. The dependent variable is participants' scores on the ATDP - Form A. This hypothesis was tested by performing a one-way ANOVA on the pretest scores of the four experimental groups and control group A. Following this analysis, the posttest mean score of control group A was compared against the posttest mean scores of the four experimental groups.

2. Nondisabled college students participating in a disability simulation experience using a wheelchair will demonstrate significantly greater positive attitudes, as measured by the ADTP - Form A, than a second experimental group using crutches.

The independent variable, disability simulation, has two levels: (a) disability simulation using a wheelchair, and (b) disability simulation using crutches. This hypothesis was tested by using a $2 \times 2 \times 2$ mixed-design factorial ANOVA.

3. Nondisabled college students participating in a disability simulation experience who have been informed they will be observed will demonstrate significantly greater positive attitudes, as measured by the ATDP - Form A, than a second experimental group who have not been informed that they will be observed.

The independent variable, observation, has two levels: (a) presence of informed observation, and (b) absence of informed observation. This hypothesis was tested by using a $2 \times 2 \times 2$ mixed-design factorial ANOVA.

4. A significant correlation will exist between the two measures of attitudes used in this study, the ATDP - Form A (posttest) and the DIQ, among a group of nondisabled college students participating in a disability simulation experience.
This hypothesis was tested by computing the correlation coefficient between posttest scores on the ATDP- Form A and scores on the DIQ.

An alpha of .05 was used as the critical level for all statistical analyses.
Chapter IV

RESULTS OF THE INVESTIGATION

This chapter, which is divided into three main sections, presents the findings of this study which investigated the effects of disability simulations on attitudes toward people with disabilities, and describes the procedures used to arrive at the results. The first section describes the statistical procedures used to analyze the data and addresses the study's four main hypotheses. The second section of the chapter describes qualitative data related to the participants' subjective reactions to their simulation experience. The chapter concludes with a summary section reviewing all study findings.

Analysis of the Data

A total of 60 individuals participated in this study, including 40 in the experimental groups and 20 in the control groups. All individuals serving in the experimental groups were pretested on the ATDP - Form A (Yuker & Block, 1986) prior to their participation in the study. These participants were posttested on the ATDP - Form A and the DIQ immediately following their disability simulation experience. Among the 20 control group subjects, 10 served in control group A and were pretested on the ATDP - Form A and posttested on the ATDP and the DIQ, but did not participate in a simulation. The 10 subjects in control group B were posttested only on the ATDP - Form A and the DIQ, and also did not participate in a simulation.
Table 1

ATDP - Form A Mean Scores and Standard Deviations at Pretest and Posttest for Four Experimental Groups and Control Group A

<table>
<thead>
<tr>
<th>Group</th>
<th>M</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheelchair/Obs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pre</td>
<td>124.7</td>
<td>22.78</td>
<td>10</td>
</tr>
<tr>
<td>post</td>
<td>131.6</td>
<td>24.05</td>
<td>10</td>
</tr>
<tr>
<td>Wheelchair/Unobs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pre</td>
<td>118.6</td>
<td>14.59</td>
<td>10</td>
</tr>
<tr>
<td>post</td>
<td>122.5</td>
<td>17.30</td>
<td>10</td>
</tr>
<tr>
<td>Crutches/Obs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pre</td>
<td>116.8</td>
<td>27.52</td>
<td>10</td>
</tr>
<tr>
<td>post</td>
<td>107.8</td>
<td>21.21</td>
<td>10</td>
</tr>
<tr>
<td>Crutches/Unobs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pre</td>
<td>130.2</td>
<td>13.11</td>
<td>10</td>
</tr>
<tr>
<td>post</td>
<td>125.4</td>
<td>19.60</td>
<td>10</td>
</tr>
<tr>
<td>Control Group A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pre</td>
<td>118.8</td>
<td>16.46</td>
<td>10</td>
</tr>
<tr>
<td>post</td>
<td>125.2</td>
<td>13.48</td>
<td>10</td>
</tr>
</tbody>
</table>

variances (Kanji, 1993) was performed on the data presented in Table 1. The resulting value was below the critical level, indicating that the variances across groups were not significantly heterogeneous. The third assumption outlined by Ferguson and Takane is that scores on the dependent variable are statistically independent given the group to which they belong. This assumption was met through the use of random assignment of
participants to the various groups. There is no evidence to suggest any major violation of the assumptions underlying the use of the ANOVA with the ATDP in this study.

Before performing the mixed-design ANOVA, two additional analyses were carried out as procedural checks on the data. The first analysis examined the pretest ATDP scores of the four experimental groups and control group A using a one-way ANOVA. The purpose of this analysis was to confirm that significant differences between groups did not exist prior to the experimental intervention. The results of this preliminary analysis were not significant, $F(4, 45) = .80, p > .05$. This finding indicates that no significant pre-existing differences in ATDP scores occurred between the various groups in this study, suggesting that any critical differences observed at posttest are attributable to the effects of the intervention.

The second analysis addressed the issue of pretest sensitization, which was described in the section "Limitations of the Study" in Chapter One. Pretest sensitization, which was identified as a threat to the external validity of this experiment, occurs when the pretest interacts with the experimental intervention and influences the results (Borg & Gall, 1989). As a procedural check, this study included two control groups, each containing ten members. Both control groups were posttested on the ATDP and DIQ, and neither group participated in a disability simulation. However, while control group A was pretested on the ATDP, control group B instead completed a dummy attitude scale which was randomly mixed in among the ATDP's at pretest. The purpose of control group B was to determine the pretest sensitization effects of the ATDP.

The posttest ATDP scores of control groups A and B were compared using an independent samples t test. The results were not significant, $t(18) = .39, p > .05$. The average of control group B's ATDP scores, 122.8, is comparable to the mean of control group A's posttest ATDP scores, 125.2. This result confirms that the effects of pretest sensitization of the ATDP in this study were not present. Pretesting participants on the ATDP cannot account for a significantly higher score at posttest.
Mixed-design ANOVA

A 2 x 2 x 2 mixed-design factorial analysis of variance (ANOVA) was performed on ATDP data collected from the four experimental groups. The three factors investigated were (a) type of simulation (S) (wheelchair simulation vs. crutches simulation), (b) the presence or absence of observation (O), and (c) the time of administration of the ATDP (T) (pretest vs. posttest). The results of this analysis of the ATDP are presented in Table 2.

Table 2

Source Table of Analysis of Variance for ATDP - Form A

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Simulation (S)</td>
<td>369.80</td>
<td>1</td>
<td>369.80</td>
<td>.51</td>
</tr>
<tr>
<td>Observation (O)</td>
<td>312.05</td>
<td>1</td>
<td>312.05</td>
<td>.43</td>
</tr>
<tr>
<td>S x O</td>
<td>2668.05</td>
<td>1</td>
<td>2668.05</td>
<td>3.67</td>
</tr>
<tr>
<td>Error</td>
<td>26143.90</td>
<td>36</td>
<td>726.22</td>
<td></td>
</tr>
<tr>
<td>Time of Administration (T)</td>
<td>11.25</td>
<td>1</td>
<td>11.25</td>
<td>.10</td>
</tr>
<tr>
<td>S x T</td>
<td>756.45</td>
<td>1</td>
<td>756.45</td>
<td>6.46*</td>
</tr>
<tr>
<td>O x T</td>
<td>1.80</td>
<td>1</td>
<td>1.80</td>
<td>.02</td>
</tr>
<tr>
<td>S x O x T</td>
<td>64.80</td>
<td>1</td>
<td>64.80</td>
<td>.55</td>
</tr>
<tr>
<td>Error</td>
<td>4214.70</td>
<td>36</td>
<td>117.08</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05

When examining differences between groups of subjects, the main effects of the type of simulation in which subjects participated (S) and whether or not they were informed of observation (O) were not found to be significant. The interaction of simulation by
observation (S x O) was also non-significant. When examining differences within
subjects, the interaction of type of simulation by time of administration (S x T) was found
to be significant, F (1, 36) = 6.46, p < .05. Participants scored significantly different at
posttest than they did at pretest based on the type of simulation they were exposed to.
This finding will be discussed further under the heading "Hypothesis Two."

No other significant findings were obtained based on within subjects data. The main
effect of time of administration of the ATDP (T) was not significant. Neither the
interaction of observation by time (O x T), nor the interaction of simulation by observation
by time (S x O x T) were found to be significant.

The following sections address the first three of this study's four main hypotheses.

**Hypothesis One**

The first hypothesis predicted that individuals participating in a disability simulation
experience would demonstrate significantly greater positive attitudes, as measured by
ATDP, than individuals participating in a no-treatment control group. The procedural
check described earlier in this chapter confirmed that no significant differences in pretest
ATDP scores were found between the five groups who were pretested, including control
group A. Because the posttest mean score of control group A (M = 125.2) was found to
lie within the range of the posttest mean scores of the four experimental groups (M =
107.8 - 131.6), it was also clear that a significant difference did not exist between the
posttest scores of the experimental groups and control group A.

Hypothesis one was not supported by the data. There was not a significant difference
between the ATDP scores of the control subjects as compared to the experimental
subjects. Because the first hypothesis was not confirmed, it is impossible to conclude that
disability simulations automatically promote positive attitudes toward people with
disabilities, as measured by the ATDP - Form A. Individuals in control group A expressed
global attitudes toward people with disabilities that were comparable to the attitudes
expressed by subjects in the simulation groups. However, the results of the mixed-design
ANOVA show that participants who performed a wheelchair simulation responded differently to the ATDP - Form A than did participants who carried out a crutches simulation, a finding related to hypothesis two.

Hypothesis Two

The second hypothesis predicted that individuals who performed a disability simulation using a wheelchair would display significantly greater positive attitudes, as measured by the ATDP - Form A, than individuals who performed a disability simulation using crutches. The greater hypothesized attitude change displayed by the wheelchair group was explained through the application of cognitive dissonance theory (Festinger, 1957). Participants performing a wheelchair simulation presumably experienced a greater amount of stress and anxiety than subjects using crutches due to negative connotations associated with the use of a wheelchair. Wheelchair subjects also presumably encountered more physical and environmental obstacles while carrying out this task. The aversive nature of the task, in addition to the greater effort needed to accomplish it, created a higher level of dissonance which could be alleviated through a positive change in attitudes as assessed by the ATDP.

This hypothesis was tested by examining the interaction of type of simulation by time of administration of the ATDP (S x T), reported in Table 2. While the ATDP scores of the wheelchair subjects improved from 121.65 at pretest to 127.05 at posttest, the scores of the crutches subjects declined from 123.5 to 116.6. This interaction was significant, F (1, 36) = 6.46, p < .05.

Hypothesis two was supported by the data. Individuals who participated in the wheelchair simulation expressed greater positive attitudes following the simulation, based on the ATDP, than individuals who participated in the crutches simulation. The fact that the wheelchair groups' scores improved while the crutches groups' scores declined suggests that the most important variable in disability simulation exercises may be the type of simulation that subjects perform. Participants who used a wheelchair appeared to have
a more positive experience than those using crutches. Another variable examined in this study, the presence or absence of informed observation, is discussed below.

**Hypothesis Three**

The third hypothesis predicted that individuals who were informed that they were being observed during their simulation experience would demonstrate significantly greater positive attitudes, as measured by the ATDP - Form A, than individuals who were not informed of observation. This hypothesis was tested by examining the interaction of the presence or absence of observation by time of administration of the ATDP (O x T), reported in Table 2. The interaction was not significant, $F(1, 36) = .02, p > .05$. This finding indicates that participants did not score differently on the ATDP from pretest to posttest regardless of whether they were informed about observation or not.

Hypothesis three was not supported by the data. Informing participants that they would be observed during their simulation experience appeared to have little effect on their attitude. The fact that the researcher was observing subjects may have had only minimal impact since subjects performed the simulation in a public place, and therefore had the opportunity to be observed by many individuals. Informed observation by the researcher did not have a significant effect on participants' attitudes in this study.

**Analysis of the DIQ**

Participants' responses to the DIQ were scored according to the procedure outlined in Chapter Three. Subjects were given 1 point for each "yes" response to the following two questions: (a) I would be interested in attending a focus group at the university involving ways to improve facilities for people with disabilities on campus; (b) I would be interested in volunteering to provide prospective students with disabilities with an hour tour of the campus. Participants were given one additional point for indicating their name and telephone number. Therefore, subjects compiled a score between 0 and 3 based upon their responses to the DIQ. Table 3 lists the means and standard deviations of participants' scores on the DIQ for the four experimental groups and two control groups.
Table 3

DIQ Mean Scores and Standard Deviations for Four Experimental Groups and Two Control Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>M</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheelchair/Obs.</td>
<td>1.8</td>
<td>1.32</td>
<td>10</td>
</tr>
<tr>
<td>Wheelchair/Unobs.</td>
<td>2.4</td>
<td>.97</td>
<td>10</td>
</tr>
<tr>
<td>Crutches/Obs.</td>
<td>1.7</td>
<td>1.25</td>
<td>10</td>
</tr>
<tr>
<td>Crutches/Unobs.</td>
<td>1.5</td>
<td>1.35</td>
<td>10</td>
</tr>
<tr>
<td>Control Group A</td>
<td>2.2</td>
<td>.92</td>
<td>10</td>
</tr>
<tr>
<td>Control Group B</td>
<td>1.9</td>
<td>1.27</td>
<td>10</td>
</tr>
</tbody>
</table>

Because the data presented in Table 3 was analyzed using an ANOVA, the same assumptions listed by Ferguson and Takane (1989), which were outlined in the previous section, had to be met if the results are to be considered valid. An exploratory data analysis examined the skewness of DIQ scores by plotting the scores on a bar graph and comparing them to a normal distribution. The DIQ data was skewed for high values, but this was most likely due to the design of the instrument. Because the DIQ asked participants who responded "yes" to either of the two questions to provide their name and telephone number, it was unlikely that subjects would compile a score of 1. Rather, scores of 0, 2, or 3 were common, while no subjects scored 1. The DIQ was skewed for higher values because more participants scored 2 or 3 than scored 0. The second assumption, that variances across groups are equal, was again checked by performing Hartley's test for equality of variances (Kanji, 1993). As with the data for the ATDP, the resulting value for the DIQ was below the critical level, indicating that the variances across groups were not significantly heterogeneous. The third assumption was not violated because each DIQ
score is statistically independent due to the random assignment of subjects. Because the DIQ was customized specifically for this study, the results obtained from the analysis of this instrument should be interpreted cautiously.

The DIQ was analyzed using a 2 x 2 factorial ANOVA. This statistical method was chosen because it allows for the simultaneous analysis of two variables, including the main effects of each variable as well as their interaction (Ferguson & Takane, 1989). The two factors examined in this analysis were type of simulation (S) (wheelchair group vs. crutches group) and the presence or absence of observation (O). The results of this analysis are presented in Table 4.

Table 4
Source Table of Analysis of Variance for the DIQ

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Simulation (S)</td>
<td>1.83</td>
<td>1</td>
<td>1.83</td>
<td>1.20</td>
</tr>
<tr>
<td>Observation (O)</td>
<td>.69</td>
<td>1</td>
<td>.69</td>
<td>.46</td>
</tr>
<tr>
<td>S x O</td>
<td>2.12</td>
<td>1</td>
<td>2.12</td>
<td>1.40</td>
</tr>
<tr>
<td>Error</td>
<td>53.00</td>
<td>35</td>
<td>1.51</td>
<td></td>
</tr>
</tbody>
</table>

The results presented in Table 4 indicate that no significant F values were obtained based upon subjects' responses to the DIQ. Neither the factors of type of simulation (S) or the presence or absence of observation (O), nor the interaction between them (S x O), produced significant results.

Although too small to be significant, the experimental groups did display differences in their responses to the DIQ. The wheelchair simulation groups scored a mean of 2.1 on the DIQ, while the crutches simulation groups averaged 1.6. This difference in DIQ scores,
though not statistically significant, mirrors the differences in ATDP scores observed at posttest between the wheelchair and crutches groups. The positive attitudes of the wheelchair subjects were reflected by both the ATDP and the DIQ.

The following section describes an additional analysis of the DIQ addressed in this study's fourth main hypothesis.

**Hypothesis Four**

The fourth hypothesis predicted that a significant correlation would exist between the two measures of attitudes used in this study, the ATDP - Form A at posttest and the DIQ. This hypothesis was tested by calculating the correlation coefficient between the DIQ and the ATDP among the four experimental groups and control group A. The DIQ did not significantly correlate with the ATDP at posttest, $r (48) = .038, p > .05$. However, the DIQ did correlate significantly with subjects' pretest scores on the ATDP, $r (48) = .30, p < .05$.

The fourth hypothesis was not directly confirmed, since posttest ATDP scores did not significantly correlate with the DIQ, as was predicted. However, the DIQ was unexpectedly found to be related to subjects' pre-existing attitudes toward people with disabilities as reflected by their pretest ATDP scores. This finding suggests that the DIQ, an instrument created specifically for this study, is measuring some of the same dimensions of attitudes as the ATDP, an established and well-used scale. Because the DIQ was designed to assess the behavioral component of attitudes toward people with disabilities, this result points to a relationship between subjects' attitudes as reflected by the ATDP and subjects' willingness to participate in activities related to persons with disabilities as measured by the DIQ. This finding supports the ATDP - Form A as a behaviorally valid measure of attitudes.

A relationship was found between participants' pre-existing attitudes toward persons with disabilities and their willingness to engage in meaningful behaviors involving disability. However, a relationship between the ATDP and the DIQ was not found when
comparing participants' posttest ATDP scores. This surprising finding suggests that the
ability to predict participants' behaviors from their attitudes was diminished following the
simulation. This finding also suggests that the simulation experience did not positively
modify the behaviors, or the attitudes, of the subjects. The study participants had a variety
of responses to the simulation, but their responses were not overwhelmingly positive

Qualitative Data

Qualitative data was collected for all 40 individuals who participated in one of the four
disability simulation groups. The data was gathered in the form of an unstructured
interview which took place following the disability simulation task and the completion of
the two posttest measures. Participants were asked general, open-ended questions that
encouraged them to describe their experience and process their reactions. Participants
were then asked to reflect upon and answer the three questions originally posed to them
during the introduction to the experiment. Specifically, these questions were:

1. What changes in the physical environment would benefit me the most?
2. What changes do I personally need to make to better adapt to my situation?
3. What social and personal events during my brief campus tour have I found helpful
   or not helpful? How do others respond to me? How do I feel about myself right now?

The researcher recorded participants' responses by taking handwritten notes during the
interviews. For confidentiality purposes, subjects were not identified by group
membership. Because the data presented here is highly subjective, no attempt was made to
compare one simulation group against another, or determine the statistical significance of
participants' responses. Instead, this qualitative data is best interpreted as reflecting the
immediate reactions of the subjects as a whole to their simulation experience.

The researcher's written notes of the interviews were examined for the most common
reactions to the simulation experience. Among the 40 participants, 73% (n = 29) reported
problems associated with ambulating while using the wheelchair or crutches. This was the
single most frequent comment elicited during the post-simulation interviews. Typical responses for this group included difficulties steering and maneuvering the wheelchair, challenging uphill and downhill slopes, and the amount of physical exertion required to cover distances while using crutches. Participants' specific criticisms of the physical environment and their ideas for changes will be further discussed below.

The second most frequent response recorded during the interview sessions was subjects' report of feeling uncomfortable, ashamed, self-conscious, or worried about how others perceived them. This negative emotional response was reported by 48% (n = 19) of the participants. Typical responses for this group included feelings of embarrassment while seated in the wheelchair, awkwardness when approached by friends and acquaintances, and self-consciousness regarding taking up space on sidewalks and acting as an obstacle to others. Some of these subjects seemed to deny their right to use sidewalk space based upon their temporary disability.

The negative emotional response reported by nearly half of the subjects reflects some of the criticisms of simulations made by French (1992). French argues that wheelchair simulation participants can experience low self-esteem in addition to feeling unattractive and embarrassed. Simulations can have counter-productive effects if these negative feelings are projected onto people with disabilities.

Although many individuals reported unpleasant feelings and had problems ambulating while carrying out the simulation, 45% (n = 18) stated that, in general, the people they encountered on their brief campus tour were helpful or gave them a positive reaction. Typical responses for this group included having others express concern or ask how they are doing, offer or provide some type of physical assistance (e.g., help push the wheelchair over a curb), or a general awareness on the part of the subjects that more people than usual smiled at them or made eye contact. On the other hand, a smaller percentage of participants (23%, n = 9) reported that, in general, people were not helpful or gave them a negative response. Typical responses for this group included encountering people who did
not make room to allow the subject to pass, persons who seemed annoyed at the subject's slow pace, or noticing others looking away or averting eye contact. One female participant reported being hit in the head with a football while performing her simulation. Even though she received an apology, she felt mistreated on the basis of her temporary disability.

One quarter of the participants (25%, n = 10) reported feeling frustrated, angry, or annoyed at the completion of their simulation experience. While many subjects had specific negative reactions to certain aspects of the simulation, such as feeling self-conscious or having difficulties ambulating, this group demonstrated a more intense, global, negative reaction. One participant who had a particularly hard time using crutches described her experience as "terrible." Another subject could not observe the reactions of passers-by due to being preoccupied with a "painfully slow" simulation using crutches. One wheelchair participant dubbed this task "the hardest thing I've ever done." This group appeared to have an especially difficult time carrying out the simulation task, which negatively tainted their entire experience.

The fact that a fairly large subgroup of simulation participants expressed strong feelings of frustration supports the views of Wright (1978) that simulations can promote negative attitudes. Subjects who do not easily cope with the stressors inherent in performing a simulation may be most at risk for having an overall bad experience (Kiger, 1992).

While the disability simulation proved to be an aversive task for some, 23% (n = 9) of the participants reported gaining a new awareness and insight into the lifestyle of a person with disabilities. Some of these individuals felt a need to be independent while carrying out the simulation, and declined offers of assistance. Others became aware of the attention a person with disabilities receives based solely on their disability, or how some people looked away and avoided them because they were using a wheelchair or crutches. These individuals were able to make the connection between their brief exposure to living
with a disability and the day to day life of a person with disabilities. In general, this group reported a positive experience and stated that their attitudes toward persons with disabilities had changed.

After the participants had been interviewed regarding their subjective reactions to the simulation, each individual was asked to reply to the three questions posed at the introduction to the experiment. The first question, which pertained to changes in the physical environment, received the largest response. As noted above, 73% of the subjects reported problems while ambulating using the wheelchair or crutches. Some subjects noted that the university campus is not wheelchair-friendly. Sidewalks are uneven in places and become puddles during a rain storm. Wheelchair subjects complained of a curb that was particularly hard to pass over. Even though it was not part of the simulation, several individuals commented on a steep ramp with a sharp turn that provided wheelchair access to one of the academic halls, and noted a raised metal lip in the doorway that could be a serious obstacle to a wheelchair user. Certain buildings on the campus were described as being non-wheelchair accessible. Additional obstacles were created by trucks that were part of the construction of a new academic building. One wheelchair subject could not easily access the green because a truck was blocking the ramp. Participants who used crutches complained of cracks in the sidewalk, litter, and broken glass. The layout of the campus also provided challenges. Some noted it could be difficult having back-to-back classes in different buildings, since the traveling distance can be substantial. Most wheelchair participants did not realize that the campus is sloped on a hillside until they attempted to navigate a slightly uphill path in the wheelchair.

While some aspects of the physical environment are fixed (e.g., the slope of the campus), many individuals recommended making the campus more wheelchair-friendly by improving building access and repaving certain portions of the sidewalks and paths. Sidewalks could be made wider to better accommodate wheelchairs, cracks and gaps
could be filled in to allow for a smoother ride, and curbs could be eliminated along outdoor paths.

The second question pertained to personal changes the participants could make to better adapt to living with a disability. The most common response to this question involved practical concerns such as time management and scheduling. Some individuals noted they would have to arrive earlier for their classes, plan their schedule to avoid consecutive classes in different buildings, and find more efficient methods for carrying books and personal belongings while on campus. Several subjects stated they would have to become more ambitious and put forth a greater effort if they were to complete their college education with a severe physical disability. Interestingly, no participants suggested that the university could make things easier by altering class locations or by placing related classes together in the same building. Perhaps subjects' negative feelings about themselves which arose during the simulation affected their ability to act in a self-assertive manner.

The third question asked participants to describe positive and negative personal events which occurred during their simulation, including how others responded to them and feelings about themselves. As described above, the majority of the participants had some type of reaction to the responses of others. However, some subjects were not able to comment on how others reacted to them, possibly because they avoided or ignored other people while performing the simulation, or they simply did not encounter any individuals during their brief campus tour. Many expressed negative feelings about themselves, such as shame and self-consciousness. Some noted that other people could reinforce negative feelings by showing pity or attempting to be too helpful. Some felt a sense of accomplishment and success upon completing the simulation. Others stated they were relieved that this experience was only temporary.

The qualitative data presented here is useful for expanding the scope of the investigation by providing information that is not necessarily reflected by the quantitative measures. The qualitative data summarizes the subjective experience of the study
participants and their reactions to their brief exposure to living with a physical disability. This information can better help to explain and interpret the positive and negative experiences gained through participation in a disability simulation.

Summary

This chapter presented the results of the study, which investigated the effects of disability simulations on attitudes toward people with disabilities. Procedural checks on the ATDP data confirmed that significant differences between groups did not exist prior to the experimental intervention, and that the effects of pretest sensitization were not present. The ATDP was analyzed using a 2 x 2 x 2 mixed-design ANOVA, with the three factors being type of simulation (wheelchair vs. crutches), the presence or absence of observation, and the time of administration of the ATDP (pretest vs. posttest).

The first hypothesis predicted that individuals participating in a disability simulation experience would demonstrate significantly greater positive attitudes as measured by the ATDP - Form A than a no-treatment control group. This hypothesis was not supported by the data. Participation in a disability simulation exercise was not found to automatically improve attitudes toward people with disabilities. However, the second hypothesis, which predicted that individuals performing a simulation using a wheelchair would demonstrate significantly greater positive attitudes on the ATDP - Form A than individuals using crutches, was confirmed. A significant interaction occurred between the type of simulation in which subjects participated and the time of administration of the ATDP. While the scores of wheelchair participants increased from pretest to posttest, the scores of crutches participants decreased. This result can be interpreted in terms of cognitive dissonance theory (Festinger, 1957). The wheelchair group presumably experienced a greater amount of stress and anxiety due to the negative connotations and stigma associated with the use of a wheelchair. The wheelchair subjects also put forth a greater physical effort by completing the campus tour using a manually propelled wheelchair as
opposed to crutches. The aversive nature of the wheelchair simulation, coupled with the physical demands of the task, suggests this group was required to exert greater effort to accomplish their assignment. Cognitive dissonance theory proposes that greater effort produces greater dissonance (Aronson, 1968; Zimbardo & Ebbes, 1970). Individuals who completed the simulation using a wheelchair experienced a higher level of dissonance than the crutches group, and resolved it by positively modifying their attitudes toward people with disabilities as measured by the ATDP. The fact that the second hypothesis was supported by the data while the first hypothesis was not suggests that the most important variable may be the type of simulation subjects are exposed to. The wheelchair simulation was more effective at positively modifying participants' attitudes than the crutches simulation.

The third hypothesis predicted that individuals who were informed about observation prior to their simulation experience would demonstrate significantly greater positive attitudes on the ATDP - Form A than individuals who were not informed about observation. This hypothesis was not supported by the data. Although observation may play a role by motivating subjects to take their simulation experience very seriously and to put forth greater effort, thereby creating a higher level of cognitive dissonance, in this study the effects of observation as measured by the ATDP were inconclusive. Most individuals were observed by others while performing their simulation and many had strong reactions based upon how others responded to them. Whether the researcher was observing subjects or not may have had less of an impact than the reactions of other people who were not involved in the study.

The fourth hypothesis predicted that a significant correlation would exist between the two measures of attitudes used in this study, the ATDP - Form A at posttest and the DIQ. This hypothesis was indirectly supported by the data because the DIQ was found to be significantly correlated with the ATDP at pretest rather than at posttest. This unexpected finding indicates a relationship between subjects' pre-existing attitudes toward people with
disabilities and subjects' behavior in the form of a willingness to participate in activities related to people with disabilities. This result supports the ATDP as a behaviorally valid measure of attitudes. However, because the effect of the simulation was to diminish the strength of the relationship between participants' attitudes and behaviors, this result also indicates that simulations do not automatically improve attitudes or improve behaviors.

Additional analysis of the DIQ using a 2 x 2 ANOVA found no significant differences based on group membership, the presence or absence of observation, or the interaction of these two factors.

Finally, qualitative data was reported which described and summarized the study participants' subjective reactions to their simulation experience. Not surprisingly, the most common response involved difficulties ambulating while using the wheelchair or crutches. Many participants provided suggestions for improving the university campus for people with disabilities. Nearly half the subjects reported a negative emotional response to the simulation, including feelings of self-consciousness and embarrassment. While nine individuals stated that they received a negative response from others while performing the simulation, twice as many participants reported that the people they encountered were helpful and responded positively to them. One quarter of the participants reported a strong negative personal reaction to the simulation experience, while a similar number indicated gaining a new awareness and insight into living with a disability. The qualitative data suggests that most subjects who participated in a simulation were emotionally affected by their experience. Although many participants appeared to have a positive experience, a substantial subgroup who had a particularly difficult time performing the simulation task ended up feeling angry and frustrated. This finding supports the contentions made by critics of simulations that these exercises run the risk of provoking unpleasant reactions, and can ultimately reinforce negative attitudes (French, 1992; Kiger, 1992; Wright, 1978). Most of the participants in the group reporting the strongest negative reactions appeared to have problems with the physical demands of the simulation,
a finding which supports Clunies-Ross and O'Meara's (1989) argument that successful simulations allow subjects to cope well with the task. Additional suggestions for improving the quality of simulations based upon the results of this study will be discussed in the next chapter.
Chapter V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Research Issues and Results

This experiment investigated nondisabled individuals' attitudes toward people with disabilities, and the use of disability simulations as a method of attitude change. Attitudes toward people with disabilities have historically been negatively influenced by long-standing models used to conceptualize disability. The biological model of disability characterizes people with disabilities through the use of diagnostic labels, which tend to focus on the person's impairment (Meyerson, 1990). The economic model highlights the limitations faced by people with disabilities to work and financially contribute to society (Hahn, 1985; Safilios-Rothschild, 1970). A more recent model for conceptualizing disability, the social model, challenges the previously held views that persons with disabilities are biologically and economically inferior. The social model argues that certain negative processes found in the interpersonal environments of persons with disabilities, for example, prejudice and discrimination, are often more formidable obstacles to overcome than the disability itself (Meyerson). The social model implies that attitudes held toward people with disabilities have a powerful effect, and suggests that positively enhancing attitudes can facilitate greater acceptance of persons with disabilities into the larger society.

Hundreds of studies attempting to positively modify attitudes toward persons with disabilities have been published over the years. Shaver et al.'s (1989) meta-analysis identified the four most successful methods of attitude modification as persuasive
messages, information plus contact, contact alone, and vicarious experience, which includes disability simulations. Among these methods, disability simulations have been the most controversial. Some authors have suggested that simulations are useful for highlighting the adaptive skills and coping mechanisms of people with disabilities (Wesson & Mandell, 1989). Others have noted that simulations can help nondisabled people feel less anxious toward persons with disabilities (Lipsky, 1981). However, critics of simulations have argued that these exercises can be unsafe, often create false impressions about disabilities, and, like the medical model, focus exclusively on the impairment (French, 1992; Kappan, 1994). Additionally, a review of the simulation literature highlighted three major methodological flaws found in many studies. These flaws included an assumption that simulations were interchangeable, the use of poor dependent measures such as unstandardized scales and subjective reports, and a lack of behavioral measures used to assess attitude change.

This study sought to determine if, given the above criticisms, disability simulations should continue to be used as a legitimate attitude modification strategy. The practical, theoretical, and methodological weaknesses characteristic of much of the simulation literature were addressed in several ways. The simulation experience evaluated by this study was approved by the university's IRB, and was structured to present minimal safety risks to participants. Study participants were trained to use the equipment properly before beginning their simulation. Regarding the methodological flaws described above, this experiment did not use simulations interchangeably. Rather, two qualitatively different simulations, an experience in a wheelchair and an experience on crutches, were compared against one another. Two dependent variables were used, the Attitudes Toward Disabled Persons Scale - Form A (ATDP - Form A; Yuker & Block, 1986), and the disability interest questionnaire (DIQ). The ATDP, the most widely used scale for measuring attitudes toward people with disabilities, is a standardized instrument with acceptable levels of reliability and validity (Furnham & Pendred, 1983; Yuker,1986). The DIQ,
which was customized specifically for this study, was used as the behavioral dependent variable. This study included two control groups, and all participants were randomly assigned to their respective conditions. This study also investigated the effects of the presence or absence of informed consent on subjects' attitudes, although all subjects were inconspicuously observed to ensure their compliance with the experimental tasks.

Cognitive dissonance theory (Festinger, 1957) was the model used to predict and explain attitude change. Finally, this study incorporated the coping framework, proposed by Wright (1978) into the design. The purpose of the coping framework was to replace the emphasis on the imposed disability with an emphasis on the strengths of persons with disabilities to be problem solvers and to make positive changes in their environments.

**Hypothesis One**

Hypothesis one predicted that individuals participating in a disability simulation experience would demonstrate significantly greater positive attitudes, as measured by the ATDP - Form A, than individuals participating in a no-treatment control group. This hypothesis was not supported by the data. Participants in control group A expressed global attitudes toward people with disabilities that were comparable to the attitudes expressed by subjects in the simulation groups.

The results of this study indicate that participation in a disability simulation exercise does not automatically improve attitudes toward people with disabilities. This result is surprising given the findings of Shaver et al. (1989) that vicarious experience, which includes disability simulations, is the fourth most successful attitude modification strategy. The qualitative data, presented in Chapter 4, can help to explain and interpret the results of this experiment. One quarter of the experimental group reported feeling frustrated, angry, or annoyed at the completion of their simulation experience. Although a larger percentage of participants reported difficulties ambulating, or experienced negative emotions such as embarrassment, this subgroup consisting of 10 subjects expressed a more intense, unpleasant reaction to their simulation. Apparently, this group had difficulty
coping with the demands and requirements of the experiment, which led to strong feelings of frustration. This frustration may have been expressed through the dependent measures, counterbalancing the more positive reactions of other subjects. This result suggests that simulations are not for everyone, and that some individuals can more easily cope with the stressors of simulation activities better than others.

The finding that a fairly large subgroup expressed negative feelings following the simulation supports the views of Wright (1978). Wright has suggested that simulations can provoke intense emotional responses from participants, often leading to frustration, because the loss experienced by the individual with the temporary disability is not easily balanced by more positive factors. A similar opinion is offered by Kiger (1992), who argues that the stressors created by the simulation experience can influence greater negative attitudes. Participants can project their unpleasant reaction to the simulation onto people with disabilities, thereby reinforcing negative attitudes (French, 1992). Participants can also project their unpleasant reactions onto scales assessing their attitudes, in this case the ATDP.

Clunies-Ross and O'Meara (1989) have suggested that successful simulations allow participants to cope well with the task. It could be that the physical demands of the simulation, in addition to the psychological stressors, became too overwhelming for some subjects. It is ironic that the physical and psychological stressors that the study participants faced helped to make the simulation more realistic, and yet these same stressors made the simulation a negative experience for some subjects. Future research may seek to predict the personality characteristics of those who cope successfully versus those who cope unsuccessfully with disability simulations.

**Hypothesis Two**

Hypothesis two predicted that individuals who performed a disability simulation using a wheelchair would display significantly greater positive attitudes, as measured by the ATDP - Form A, than individuals who performed a disability simulation using crutches.
This hypothesis was supported by the data. A significant interaction between type of simulation and time of administration of the ATDP indicated that wheelchair subjects' scores increased from pre to posttest, while crutches subjects' scores decreased. This result can be interpreted based on cognitive dissonance theory (Festinger, 1957). Those individuals who performed the wheelchair simulation were compelled to work harder and put forth greater physical effort to complete their brief campus tour than those using crutches. These participants were also exposed to the psychological stigma that the wheelchair itself conveys. The qualitative data confirms that many subjects felt uncomfortable and embarrassed while seated in the wheelchair. This combination of physical and psychological stressors created a higher level of dissonance among the wheelchair subjects, which was resolved by expressing enhanced positive attitudes on the posttest ATDP. Although the wheelchair simulation appeared to create higher levels of cognitive dissonance, resulting in improved attitudes, the results of the qualitative data suggest that this task also runs the risk of becoming too frustrating to the participants, which could ultimately lower the scores of the dependent measure.

The viewpoint offered by Clunies-Ross and O'Meara (1989), that successful simulations allow participants to cope well with the task, appears to contradict the data supporting the second hypothesis. If the wheelchair simulation was truly an aversive task, as the qualitative data suggests, then these authors might argue that participants would most likely not easily cope with the task, and would not demonstrate improved attitudes. It could be that the wheelchair simulation presented a task that most participants found stressful but not exceedingly overwhelming, and challenging but not impossible to complete. The wheelchair simulation may have balanced the physical and psychological stressors which contributed to the subjects' experience of cognitive dissonance with a task that most participants could reasonably perform. This balance was more pronounced in the wheelchair simulation than it was in the crutches simulation.
Another way to interpret the confirmation of hypothesis two is to examine the role play component of the study. Participants were exposed to a brief scenario prior to their simulation which asked them to play the role of a recently disabled college student. The wheelchair subjects may have identified more strongly with this aspect of the study than the crutches subjects. Individuals performing a wheelchair simulation may have felt more empathy toward the hypothetical disabled student due to the severity and permanence of the injury, as indicated by the use of the wheelchair. Since the use of crutches is most often seen as temporary and less severe than the use of a wheelchair, this same process of identification may have been less pronounced among the crutches group.

The confirmation of hypothesis two suggests that simulations should not be used interchangeably. The assumption of interchangeability, which is a major weakness found throughout much of the simulation literature, does not take into account the finding that different simulations can produce different results. In this case the wheelchair simulation was found to be superior to the crutches simulation based on ATDP scores. Wheelchair simulations may be more effective due to cognitive dissonance factors or because subjects can more easily identify with and play the role of a person who uses a wheelchair. This finding suggests that simulations should be presented individually and not combined. Future research may compare wheelchair simulations against others to determine which has the most powerful positive influence on attitudes.

Hypothesis Three

Hypothesis three predicted that individuals who were informed that they were being observed during their simulation experience would demonstrate greater positive attitudes, as measured by the ATDP - Form A, than individuals who were not informed of observation. This hypothesis was not supported by the data. While the quantitative data does not show a difference between the observed and unobserved groups, the qualitative data strongly suggests that observation did play a role in this experiment, and that subjects were affected by the responses they received from others. The variable of informed
observation as measured by this experiment may have been confounded by the fact that most participants were observed by others who were not involved in the study. Because this experiment was conducted over a number of different days and times, some participants encountered many individuals while performing the simulation, while others encountered very few. Since the simulation occurred in a public place, the number of potential observers was variable and impossible to control. The qualitative data indicates that many participants felt uncomfortable and self-conscious when they encountered other people while performing the simulation. Subjects were also very aware of both the positive and negative responses they received from others. Observation by the researcher was a less important factor to the participants than the reactions from strangers, acquaintances, or friends whom they met along the way. Future research may further examine the effects of observation by more effectively controlling who the participants come in contact with while performing their simulation.

Hypothesis Four

Hypothesis four predicted that a significant correlation would exist between the two measures of attitudes used in this study, the ATDP - Form A at posttest and the DIQ. This hypothesis was indirectly supported by the data because the DIQ was found to be related to subjects' pretest scores, as opposed to posttest scores, on the ATDP. The DIQ was customized specifically for this study and used as the behavioral dependent measure. The significant correlation found between the DIQ and the ATDP supports the ATDP as a behaviorally valid attitudinal measure.

The DIQ, which assessed individuals' willingness to participate in activities meaningful to persons with disabilities on their college campus, was found to be related to subjects' pre-existing attitudes as measured by the ATDP. However, exposing participants to a disability simulation had the effect of weakening this relationship. The simulation disconnected participants' attitudes from their behaviors toward people with disabilities. This finding supports the previous result that simulations do not automatically improve
non-disabled individuals' attitudes, or behaviors, toward persons with disabilities. Subjects' pro-social behaviors were able to be predicted from their attitudes before, but not after, their participation in a disability simulation. The effect of the simulation was to diminish the ability to predict participants' behaviors, given their attitudes.

The information provided by the DIQ supports the continued use of behavioral dependent measures in research investigating simulations and other forms of attitude modification strategies. The lack of behavioral measures stands out as one of the major weaknesses found in the simulation literature. Kiger (1992) has argued that these studies in general do not investigate the relationship of attitude change to behavior change following a disability simulation. Clore and Jeffery (1972) were the only researchers who attempted to assess subjects' behavior following involvement in a disability simulation. Clore and Jeffery asked their subjects to volunteer to provide a campus tour for a student with disabilities. Although these researchers did not obtain significant results using this behavioral dependent variable, their attempt to assess both attitudes and behaviors following a simulation experience was important. The DIQ expanded the scope of Clore and Jeffery's behavioral measure by also inviting subjects to attend a focus group about people with disabilities, and requesting that interested respondents write down their name and telephone number. Asking subjects to provide their name and telephone number was an additional way of assessing their commitment and intention to participate in these activities. While a significant relationship was found between participants' pro-existing attitudes and behavior, the simulation significantly diminished the strength of this relationship. Based upon the results of this study, there is no evidence to support the claim that simulations necessarily improve behavior toward persons with disabilities.
Discussion and Conclusions

The Relationship Between Simulations and Attitudes Toward People with Disabilities

Disability simulations have been one of the primary methods used to modify attitudes toward people with disabilities. Although dozens of studies investigating simulations were published in the 1970's and 1980's, the continued focus on disability simulations as a research topic appears to be declining. This decline may be partially due to the passing of the ADA in 1990, which increased the visibility of persons with disabilities in many areas of society. This decline may also be due to the strong criticisms of simulations voiced by several authors over the past few years. While disability simulations may continue to be common in certain settings such as grade school classrooms, their widespread use as an effective attitude change strategy was not supported by the results of this study. Attitudes are difficult to change. Simulations, because of their tendency to provoke negative responses from many participants, are limited in their ability to enhance attitudes.

The subjective reactions of the simulation participants, as reported by the qualitative data, show that nearly half of the subjects reported some type of negative emotional response to the simulation. These participants stated they felt ashamed, uncomfortable, and self-conscious while performing the simulation. A smaller percentage of participants reported more intense negative feelings such as frustration and anger. These findings support the contentions of Kiger (1992), Wright (1978), and French (1992) that simulations can produce negative responses among participants that may lead to less positive attitudes toward persons with disabilities. The fact that a substantial subgroup of study participants expressed a range of unpleasant emotions in reaction to the simulation may explain why this experience did not result in improved attitudes. In addition, the simulation significantly weakened the relationship between participants' attitudes and behaviors as expressed by the dependent measures. Participating in a simulation made it much more difficult to predict subjects' behaviors toward persons with disabilities given
their attitudes. These findings do not support the notion that simulations improve either behaviors or attitudes toward people with disabilities.

The Coping Framework and Disability Simulations

Critics of simulation studies have argued that these exercises tend to individualize disability by focusing only on the imposed impairment, thereby creating false impressions (French, 1992; Kappan, 1994). A coping framework of disability (Wright, 1978) was used to address this criticism by reorienting subjects to be problem solvers and lessening the focus on the limitations imposed by the disability. As part of the coping framework of disability, participants were instructed to pay attention to possible changes in the physical environment, as well as personal changes, that could help them to better cope with life as a person with disabilities. Participants were also instructed to notice positive and negative social and personal events that occurred during their simulation experience. The coping framework was used to expand the scope of the simulation by encouraging participants to consider environmental and interpersonal factors which impact people with disabilities.

The results of the dependent measures suggest that including the coping framework in a disability simulation does not guarantee a positive outcome. However, the results of the qualitative data indicate that subjects were well aware of how others' responded to them, and were in touch with their own feelings while performing the simulation. Additionally, many participants commented on obstacles in the physical environment which could threaten their mobility. It is unclear to what extent these subjective responses were influenced by the coping framework component of the study. Subjects may have had similar reactions to their experience without being cued in advance to look for certain things. While the coping framework may have helped participants to pay more attention to the physical and social environments during their simulation, the use of the coping framework did not automatically result in improved attitudes.
The Effect of Qualitatively Different Simulations on Attitudes

While the results of this study indicate that simulations in general do not necessarily promote positive attitudes toward people with disabilities, the data also suggests that qualitatively different simulations produce different results. Hypothesis two, which was confirmed, predicted that subjects performing a wheelchair simulation would demonstrate significantly greater positive attitudes on the dependent measure than subjects performing a crutches simulation. The more positive attitudes expressed by the wheelchair groups as opposed to the crutches groups may be due to the cognitive dissonance experienced by these subjects, who were exposed to higher levels of physical and psychological stress while carrying out their simulation. Additionally, the role playing component, which has been used successfully in previous simulation research (Clore & Jeffery, 1972; Ibrahim & Herr, 1982), may have helped the wheelchair groups to more strongly identify with the role of a hypothetical student with a disability.

Although the wheelchair simulation was more successful than the crutches simulation in promoting positive attitudes, the qualitative data indicates that many subjects had a negative reaction to the wheelchair. Some subjects felt embarrassed and self-conscious sitting in the wheelchair, while others felt they were an obstacle to pedestrians and took up too much space on the sidewalks. Clearly, a wheelchair simulation is just as likely as a crutches simulation to provoke negative responses among participants. However, the wheelchair simulation was found to be superior, possibly due to the effects of the role play and cognitive dissonance. With reference to the second hypothesis, it is possible to conclude that some simulations are better than others, and that simulations should not be used interchangeably.

The Effect of Observation on Attitudes

Hypothesis three, which investigated the effects of informed observation, was not confirmed by the results of this study. Informing or not informing participants that the researcher would be observing them perform their simulation did not have a significant
effect on the dependent measure. However, the qualitative data suggests that most participants had strong reactions based on their encounters with others people, suggesting that observation was an important factor. Nearly half of the subjects reported feeling self-conscious or worried about how others' perceived them. Some participants received positive attention and offers of assistance from others, although a smaller percentage reported negative reactions from passers-by. A few of these subjects felt they were discriminated against on the basis of their temporary disability. Observation by others certainly added to the frustration and other unpleasant emotions expressed by some of the study participants at the conclusion of their simulation.

Observation poses a dilemma for disability simulation research. Participants must be observed to ensure their compliance with the task, and observation helps to make the task more of a real life experience by introducing the variables of attitudes and social response. However, this observation can make the experience much more unpleasant and difficult. The results of the study suggest that the participants were more strongly affected by the observation of strangers or those unconnected to the study as opposed to the informed observation of the researcher. Conducting the simulation indoors or in an enclosed area could prevent excessive observation by others, but could also make the experience seem more contrived and less realistic. Reducing observation could also lessen the overall emotional impact gained through a simulation, diminishing the ability of the simulation to have an effect on attitudes. On the other hand, allowing the simulation participants to be observed by others does not automatically modify attitudes either, and too much observation can make the experience overwhelmingly stressful. Future research may seek to determine the ideal amount of observation necessary to positively modify attitudes.

The quantitative data indicated that an interaction between the factors of observation and type of simulation approached significance. Wheelchair participants scored higher on the ATDP when informed of observation, while crutches subjects' scores declined when they were observed. Since this was not a significant finding, no firm conclusions can be
drawn from it. Additional research is needed to determine if observation can reliably
enhance the ATDP scores of wheelchair simulation participants.

**Strengths and Weaknesses of the Dependent Measures**

The scale used to measure attitudes in this experiment was the Attitudes Toward
Disabled Persons Scale - Form A (ATDP; Yuker & Block, 1986). The ATDP has been
the most widely used scale for assessing attitudes toward persons with disabilities (Makas
et al., 1988). The ATDP is a standardized scale possessing acceptable levels of reliability
and validity for an attitudinal measure (Yuker & Block, 1986). However, the scale has
been criticized as being too narrowly focused and lacking in behavioral validation (Makas
et al., 1988). The ATDP provides only a single summative score which may not capture
many of the factors contributing to attitudes toward persons with disabilities (Leyser et al.,
1986). The unidimensional nature of attitude scales such as the ATDP may limit their
ability to detect attitude change in simulation studies (Kiger, 1992).

Given the above criticisms, the ATDP - Form A proved to be a useful instrument for
this research project. The effects of pretest sensitization were not present. The relative
ease with which the ATDP was administered and scored became an asset when pretesting
large groups of individuals at one time. Although the scale provides only a single score,
the ATDP had the sensitivity to detect differences between groups following the
simulation. A fairly wide range of scores were reported by the ATDP, suggesting this
instrument can assess different levels of attitudes, from more positive to less positive. The
results of this study suggest that the ATDP remains a useful instrument for measuring
global attitudes toward people with disabilities.

Although the ATDP has many strengths, the unidimensional nature of the scale limits
the information it can provide, which suggests that additional measures be used to assess
attitudes. The disability interest questionnaire (DIQ) was designed specifically for this
study and used as the behavioral dependent variable. The DIQ was used to address
criticisms that the results of simulation studies frequently lack behavioral validation (Kiger,
1992). The DIQ was found to correlate with subjects' pretest scores on the ATDP, a finding which supports the ATDP as a behaviorally valid measure of attitudes. However, the lack of a correlation between the DIQ and posttest ATDP scores suggests that the simulation experience weakened the relationship between subjects' attitudes and their behaviors toward persons with disabilities. This information regarding the effect of simulations on the relationship between attitudes and behavior would not have been gained without the use of the DIQ. Behavioral measures are important for better understanding how attitude modification strategies affect participants.

Finally, qualitative data was gathered in the form of an unstructured interview following the simulation. This data provided additional information which was not necessarily reflected by the quantitative measures, in particular the subjective emotional responses of the participants to their simulation experience. The qualitative data was also very useful in helping to interpret the results of the ATDP and DIQ, and in drawing conclusions regarding the ability of simulations to modify attitudes. In future studies, the gathering of qualitative data can be improved by creating a more structured interview format, so that the responses of subjects between-groups can be more effectively analyzed. Qualitative data is crucial following an emotional and potentially frustrating experience such as a disability simulation.

Recommendations

Should Simulations Continue to be Used as an Attitude Modification Strategy?

The findings of this experiment suggest that disability simulations are limited in their ability to positively modify the attitudes of non-disabled individuals toward people with disabilities. In this study, participants who completed a simulation did not score significantly higher on an attitudinal measure than subjects who served in a no-treatment control group. Disability simulations do not automatically lead to improved attitudes, most likely because of the stressors inherent in performing a simulation. The results of
this study also suggest that simulations do not result in enhanced behaviors toward persons with disabilities.

While these findings imply that simulations may no longer be an effective means of attitude modification, several other of this study's results suggest that simulations do have some important strengths. The wheelchair simulation was found to be significantly more effective at positively modifying attitudes than the crutches simulation. Wheelchair simulations may be superior due to cognitive dissonance, and may help participants more easily identify with and play the role of a person with disabilities. Perhaps the simulation of a relatively severe disability, as characterized by the wheelchair, is a more powerful experience than the simulation of a less severe disability, as characterized by the crutches. Wheelchair simulations may also be well balanced tasks that are physically and emotionally challenging to participants, yet not too overwhelming. The results of this experiment indicate that simulations should not be used interchangeably. The continued use of wheelchair simulations is supported by this study, while the continued use of crutches simulations is not.

The fact that simulations provoke strong affective responses from participants is both an asset and a liability. Nearly half of the experimental subjects reported some type of negative emotional response to the simulation, and one-quarter of the subjects expressed more intense unpleasant emotions such as anger and frustration. While the latter of these two subgroups apparently became overwhelmed by the simulation experience, the former group was better able to cope with the demands of the task, despite feeling awkward and self-conscious. In addition, nine individuals reported gaining new insights and an awareness of the lifestyles of persons with disabilities following the simulation. This qualitative data suggests that individuals will respond to the physical and psychological stressors associated with simulations in different ways. If participants do not become overwhelmingly frustrated by the experience, but instead successfully tolerate the unpleasant feelings which simulations can provoke, the simulation will be much more
likely to have a positive effect on attitudes. Some amount of stress can enhance subjects' experience of cognitive dissonance, which may lead to improved attitudes. Too much stress will spoil the simulation for many participants, which may lead to more negative attitudes. Structuring simulations to control for excessive amounts of physical and psychological stressors may improve the ability of these exercises to positively modify attitudes.

**Recommendations for Future Research**

This experiment found that wheelchair simulations are significantly more effective than crutches simulations in positively modifying attitudes toward persons with disabilities. Future research may compare other types of disability simulations against wheelchair simulations. Previous studies have investigated simulations of a visual impairment, hearing impairment, speech impairment, and the loss of the dominant hand. These simulation exercises can be compared against an experience in a wheelchair to determine which simulation is most effective.

Despite the lack of significant differences between the groups who were informed or who were not informed about observation, the qualitative data strongly suggests that observation played a role in this experiment. While a limited amount of observation may contribute to the subjects' experience of cognitive dissonance and have a positive effect on attitudes, excessive observation may make the simulation too stressful for some subjects, resulting in negative attitudes. Future research may more effectively investigate the role observation plays in simulations, and seek to determine what amount of observation is ideal.

Another variable which may have an effect on the level of stress experienced by subjects during a disability simulation is the physical demands of the task. In this study, participants completed a brief tour of the university campus using a wheelchair or crutches for mobility. While the distance covered in the tour was not great, some individuals had problems with environmental obstacles, including the uphill and downhill slopes of the
campus paths. Others had difficulties maneuvering the wheelchair or ambulating with the crutches. For some participants, the physical aspects of the simulation alone made the experience a negative one. Future research can better analyze the stressors associated with the physical demands of simulations and how they effect attitudes.

Disability simulations present various combinations of physical and psychological stressors. Individuals who participate in simulations also present with their own unique personality characteristics. The results of this study's qualitative data suggests that some subjects are better able to cope with the demands of simulations than others. Future research may investigate the differences in personality between those subjects who cope well or who don't cope well with simulations.

Finally, future studies can expand the scope of the dependent measures used to assess attitude change following a simulation. Although the ATDP remains a useful scale, the information it provides is limited to a single score. Additional measures can be used to supplement the ATDP, particularly behavioral dependent variables. Qualitative data also proved to be very useful in this experiment, and future studies can collect subjective information in a more structured manner that is amenable to statistical analysis.
References


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Appendix A. Attitudes Toward Disabled Persons Scale - Form A
(Yuker & Block, 1986).
Mark each statement in the left margin according to how much you agree or disagree with it. Please make every one. Write +1, +2, +3: or -1, -2, -3: depending on how you feel in each case.

+3: I AGREE VERY MUCH
+2: I AGREE PRETTY MUCH
+1: I AGREE A LITTLE
-1: I DISAGREE A LITTLE
-2: I DISAGREE PRETTY MUCH
-3: I DISAGREE VERY MUCH

___ 1. Disabled people are often unfriendly.
___ 2. Disabled people should not have to compete for jobs with physically normal people.
___ 3. Disabled people are more emotional than other people.
___ 4. Most disabled persons are more self-conscious than other people.
___ 5. We should expect just as much from disabled as from nondisabled persons.
___ 6. Disabled workers cannot be as successful as other workers.
___ 7. Disabled people do not usually make much of a contribution to society.
___ 8. Most non disabled people would not want to marry anyone who is physically disabled.
___ 9. Disabled people show as much enthusiasm as other people.
___ 10. Disabled persons are usually more sensitive than other people.
___ 11. Severely disabled persons are usually untidy.
___ 12. Most disabled people feel that they are as good as other people.
___ 13. The driving test given to a disabled person should be more severe than the one given to the nondisabled.
___ 14. Disabled people are usually sociable.
___ 15. Disabled persons usually are not as conscientious as physically normal persons.
___ 16. Severe disabled persons probably worry more about their health than those who
have minor disabilities:

___ 17. Most disabled persons are not dissatisfied with themselves.
___ 18. There are more misfits among disabled persons than among nondisabled persons.
___ 19. Most disabled persons do not get discouraged easily.
___ 20. Most disabled persons resent physically normal people.
___ 21. Disabled children should compete with physically normal children.
___ 22. Most disabled persons can take care of themselves.
___ 23. It would be best if disabled persons would live and work with nondisabled persons.
___ 24. Most severely disabled persons are just as ambitious as physically normal persons.
___ 25. Disabled people are just as self-confident as other people.
___ 26. Most disabled persons want more affection and praise than other people.
___ 27. Physically disabled persons are often less intelligent than nondisabled ones.
___ 28. Most disabled persons are different from nondisabled people.
___ 29. Disabled persons don't want any more sympathy than other people.
___ 30. The way disabled people act is irritating.
Appendix B. Disability Interest Questionnaire.
Disability Interest Questionnaire

Please answer either yes or no to the following two questions:

1) I would be interested in attending a focus group at the university involving ways to improve facilities for people with disabilities on campus.  YES  NO

2) I would be interested in volunteering to provide prospective students with disabilities with an hour tour of the campus.  YES  NO

If you answered yes to either question, please indicate your name and telephone number:  

________________________________________________________________________