

Research Proposal

Changes in Disability among Older Blacks and Whites: A Study of Elderly Participants in Michigan's Medicaid Waiver Program

ABSTRACT

The proposed study aims to examine differential patterns of change in disability of Black and White elders, and mechanisms that account for racial differences in disability. In addition, it will explore whether there are different predictors of disability for older Blacks and Whites. It is hypothesized that older Blacks have more increases in disability than Whites, however, this pattern is expected to reverse among the oldest old. Socio-economic status, medical conditions, health behaviors, social support, and home and neighborhood environment are the hypothesized mechanisms for racial differences in disability. Furthermore, the predictors of disability are expected to differ between Blacks and Whites. Medical conditions and health behaviors are hypothesized to have stronger impacts on disability for Blacks, whereas social support and environment are expected to be more important predictors of disability for Whites.

Two waves of data (18 months apart) from MI Choice Information System (MICIS) will be used to examine changes in disability. The sample includes about 1,300 Black and 5,700 White elderly participants of Michigan's Medicaid Waiver program. The Waiver program provides home and community-based services to people who are low functioning and have low income. Descriptive analysis will be used to examine changes in disability, as measured by ADL and IADL, of older Black and White program participants. Regression analysis will be conducted to investigate explanatory mechanisms of racial difference in disability, and predictors of disability for older Blacks and Whites respectively. The study has the potential to inform policy makers and professionals about effective interventions to prevent deterioration of functional ability among community-dwelling elders with disability. Furthermore, it will shed light on strategies to reduce racial disparities in health and disability.

Background

Late life disability is a primary consequence of chronic diseases, which have replaced acute diseases as the most prevalent conditions in the older populations (Jette, 1998). Disability is defined as limitations in performing activities and tasks that are expected within a particular socio-cultural and physical environment (Nagi, 1965; Pope & Tarlor, 1991), such as difficulties in activities of daily living (ADL, e.g., eating, dressing) and instrumental activities of daily living (IADL, e.g., preparing meals, using the phone). The prevalence rate of disability among community-dwelling older adults in general is low. It is estimated that about 5% - 8.1% of non-institutionalized persons age 65 or more are disabled in one or more ADL (Weiner, Hanley, Clark, & Van Hostrand, 1990). However, taking into account those who live in institutions, the percentage of elderly with disabilities is much greater. For example, 94% of nursing home residents aged 65 or older were estimated to have difficulties in ADL (Hing & Bloom, 1990). Disability is a precursor for nursing home placement and other medical and social services, such as hospitalization and the use of home and community-based services. It also has a powerful effect on the quality of life of older persons and their families (Jette, 1998; Verbrugge & Jette, 1994). Hence, disability is an important problem for investigation, both in terms of individual well-being and public policy.

Objectives

The proposed study will examine disability among Black and White elderly participants of Michigan's Medicaid Waiver program (hereafter referred as Waiver). The Waiver program provides home and community-based services to support "at risk" persons, that is, those whose limitations in ADL and IADL place them at risk of nursing home placement, to live in the community. The study has four objectives: first, to understand the patterns of change in disability

of older Black and White program participant over an 18-month period; second, to investigate whether older Blacks and Whites differ in the patterns of change in disability; third, to examine explanatory mechanisms for racial differences in disability; and fourth, to investigate whether the predictors of disability vary between older Blacks and Whites.

Race and Disability

With a few exceptions (e.g., Rogers, Rogers, & Belanger, 1992), a consistent finding in disability research is that among non-institutionalized older adults, Blacks, on average, report a higher level of disability (Clark & Maddox, 1992; Gibson, 1991; Johnson & Wolinsky, 1994; Kingston & Smith, 1997; NCHS, 1992) and a greater decline in functional ability than Whites (Angel, Angel, & Himes, 1992; Crimmins & Satio, 1993; Peek, Coward, Henretta, Duncan, & Dougherty, 1997; Strawbridge, Kaplan, Camacho, & Cohen, 1992). However, the advantage of Whites seems to diminish at older ages. Among people age 80 or more, Blacks were found to be as disabled or even less disabled than Whites (Clark, Maddox, & Steinhauser, 1993; Gibson, 1991, 1994; Mendes de Leon et al., 1997). For example, Clark and colleagues (Clark et al., 1993) found that among those age 70-79, Blacks have a greater decline in ADL than Whites. However, at age 80-84 there is no significant race difference and among the oldest old (85+), Blacks are even less likely to decline in ADL than their White counterparts. This age crossover effect has been suggested to be due to adverse mortality selection process in the socially disadvantaged population (Blacks), which leaves only the healthy or physiologically robust members of the socially disadvantaged population in the old age group (Markides & Machalek, 1984).

There are many hypotheses of the mechanisms that account for racial disparity in functional ability. The most prominent is that racial differences in disability are a consequence of

economic and educational discrepancies between Blacks and Whites (Dressler, 1993; Peek et al., 1997). That is, the higher level of disability of Blacks is due to their lower socio-economic status, which has a direct link with access to resources such as health services and quality of care. Nevertheless, some studies found that the difference between Blacks and Whites still exists even after controlling for socio-economic status (Clark & Maddox, 1992; Schoenbaum & Waidmann, 1997), which suggests that other mechanisms, in addition to socio-economic status, are also responsible for the racial difference in disability.

Another mechanism that has been proposed is differences between Blacks and Whites in medical conditions (Clark & Gibson, 1997; Manton & Soldo, 1985). Some studies found that Blacks had higher prevalence of co-morbidity, hypertension, diabetes, and arthritis (Kington & Smith, 1997; Strawbridge et al., 1992), which have been shown to lead to disability. The greater susceptibility of Blacks to certain diseases may be a result of genetic predisposition. However, culture, behaviors, and access to healthcare and resources may also play a role (Clark & Gibson, 1997).

Another important dimension of racial differences in disability is that the predictors of disability may be different for older Blacks and Whites. For example, some studies found that medical conditions, including co-morbidity, arthritis, and stroke, have a stronger association with functional difficulty for older Blacks than for Whites (Leveille et al., 1998; Zsembik, Peek, & Peek, 2000). Mendes de Leon and colleagues (Mendes de Leon, Gold, Glass, Kaplan, & George, 2001) suggested that there is a stronger association between instrumental support and disability among Whites than Blacks.

In summary, there is evidence to support that older Blacks have higher levels of disability than Whites; however, at very advanced ages, this pattern may reverse. Socio-economic status

and medical conditions have been suggested as mechanisms that account for racial differences in disability. Nonetheless, some studies found that racial differences in functional ability still exist, after controlling for socio-economic status and health factors (Mendes de Leon et al., 1997).

There is some evidence to suggest that the predictors of disability may be different for Blacks and Whites.

Dynamics of Disability

The literature suggests that disability is not a static condition, but rather, a dynamic process (Manton, 1988; Manton, Corder, & Stallard, 1993). National studies of community-dwelling older people find that even for low functioning elders, improvement of disability is possible. For example, Manton (1988) found that among those with five or more limitations in activities of daily living in 1982, about 22% had improved function by 1984.

While these national studies provide an optimistic perspective on reducing disability during the later years of the life course, any effective intervention depends on a solid understanding of the factors that contribute to improvement of functional ability. Below the important findings in the literature regarding correlates of disability are summarized.

First, socio-demographic characteristics, including race, gender, age, education, and income, have been found to correlate with the functional ability of older adults. As mentioned earlier, race is a consistent predictor of disability. Past studies have also shown that women, people at older ages, and people with low education and low income have higher levels of disability (Clark & Maddox, 1992; LaPlante, 1988; Manton, 1988; Merrill, Seeman, Kasl, & Berkman, 1997; NCHS, 1992). Second, some chronic diseases are more likely to lead to disability than others. For example, cardiovascular disease and arthritis have been found to be consistent predictors of disability (Harris, Kovar, Suzman, Kleinman, & Feldman, 1989; Kaplan,

Strawbridge, Camacho, & Cohen, 1993; Keil et al., 1989). Co-morbidity is related to higher levels of disability as well (Verbrugge, Lepkowski & Imanaka, 1990). Third, health behaviors are related to disability. Numerous studies have shown that excessive drinking and smoking are hazardous to health (Kaplan et al., 1993; Keil et al., 1989). Past studies found that alcohol abuse and body mass are related to physical functioning (Clark, Callahan, Mungai, & Wolinsky, 1996; Harris et al., 1989). Previous studies also show that people who adhere to their medication are more likely to keep their chronic conditions under control and have greater potential to improve functional ability (Hamburg, 1984). Fourth, social support correlates with disability. Some studies reported that interactions with friends reduced the risk of disability whereas interactions with family are not related to disability (Mendes de Leon et al, 2001). Receiving more instrumental support, however, increases the risk of disability, whereas emotional support seems to have a protective effect, controlling for physical health status (Mendes de Leon et al., 2001; Seeman, Bruce, & McAvay, 1996). Fifth, physical and social environment have been suggested as important factors in the disablement process (Verbrugge & Jette, 1994). For example, an unsafe neighborhood may restrict the ability of older adults to exercise, access health and social services, and make social contacts, which can lead to increased disability. A hazardous home environment, such as poor lighting and fire hazards, on the other hand, can put an older person at risk of injury or disease.

Limitations of Past Studies

While the literature has informed us about important correlates of disability, it has two major limitations. First, most of these studies used representative samples of community-dwelling elders, which certainly has the advantage of representativeness. However, since the vast majority of older adults in the community are disability free, the distribution of disability (e.g.,

ADL, IADL) in these national studies is quite skewed (i.e., the majority of older adults have no ADL or IADL limitation). Such skewed distributions pose constraints in data analysis. Most studies have to dichotomize the disability variables, such as coding “0” for people without any ADL and “1” for those who have 1 or more ADL, when examining factors that are related to disability (e.g., Mendes de Leon et al., 2001; Rogers, Rogers, & Belanger, 1992). Such dichotomization not only implies that disability is crudely measured, but more importantly obscures the differences among those who are disabled. For instance, those who have 1 ADL and 4 ADL limitations would be classified under the same category – disabled. Likewise, those who have 4 ADL limitations at Time 1 and 1 at Time 2 would be classified as no change in disability. Obviously the change from having 4 ADL limitations to 1 or vice versa has significant implications for the lives of older adults.

Second and related to the first point, we know relatively little about what contributes to changes in disability among those who reside in the community and who are disabled and low functioning. This group of disabled elders is at high risk of nursing home placement. Many of them are still residing in the community because of the care provided by their informal support network. In order to develop interventions to reduce and prevent deterioration of functional ability of these elders, we need to have a better understanding of the dynamics of disability within this group.

Conceptual Framework

Based on the literature, I propose to investigate a model of disability that incorporates 5 components: socio-demographic characteristics, medical conditions, health behaviors, social support, and environment. Socio-demographic characteristics refer to predispositions that are less amenable to change, such as race, age, gender, and socio-economic status. Medical

conditions refer to chronic diseases and co-morbidity. Health behaviors refer to life style and behavioral practices that are relevant to health, such as alcohol use, smoking, adherence to medication and body mass. Social support refers to informal support of the elderly.

Characteristics of informal support of interest are relationship to the caregiver (e.g., spouse, adult child, friend) and amount of instrumental support received. Environment refers to the home and neighborhood environment of the older person.

In summary, the proposed model conceives disability as a dynamic process that is influenced by the individual, including his or her predisposing characteristics, medical conditions, and health behaviors, and the context which includes social support and the environment. This model will be used to examine explanatory mechanisms of racial differences in disability (Fig. 1). In addition, I will use this model to examine whether the correlates of disability vary between Blacks and Whites.

Significance

The proposed study has the potential to make significant contributions. First, it will suggest interventions aiming at reducing disability among community-dwelling elders who are already disabled and low functioning. For example, if health behaviors and environment are found to be associated with increases in disability, we may design an intervention that supports healthy behaviors and reduce environmental hazard. The intervention may include home calls to remind elders to take medication, diet counseling and coupons for healthy food, and modification of home environment. These elements in fact can be incorporated into the Medicaid Waiver program. The scope of intervention may also encompass community-wide efforts such as working with community partners on neighborhood safety issues. Effective disability

intervention is particularly important for this group because they are likely to demand institutionalization, if their ability in daily activities declines further.

Second, the focus on race differences in disability in the proposed study not only helps to identify the sub-group of older adults who is “in greatest need,” but also will increase our understanding of mechanisms that contribute to racial differences in disability. Such information could help policy makers to set priority for our limited resources, and to focus on the areas that would be most effective in reducing racial disparity in health and disability.

Third, the findings of the proposed study will enhance our ability to work with different racial and ethnic groups. Particularly, the study could help social workers to assess risk of disability and design interventions to restore functions of older Blacks and Whites respectively.

Lastly, the study will add to the literature in three ways. Firstly, a comprehensive model that takes into account individual, interpersonal and environmental influence on disability will be examined. Secondly, the dynamics of disability among community-dwelling elders who are disabled and low functioning, which has not been well researched, will be investigated. Thirdly, in the proposed study, both disability and changes in disability can be measured as a continuum, which is a strength compared to previous studies that measured disability dichotomously, and examined change from able to disable, or from disable to able.

Research Questions and Hypotheses

Four research questions are asked in the proposed study:

RQ1: What are the patterns of change in disability of older Blacks and Whites?

Descriptive statistics will be used to answer this question.

RQ2: Do older Whites and Blacks differ in the patterns of change in disability?

Hypothesis: Blacks are hypothesized to have more increases in disability during the 18-month study period than Whites. However, racial differences are expected to decrease at advanced ages.

Among the oldest old, Blacks are expected to have less decreases in disability than Whites.

RQ3: What accounts for differences in the change of disability between Black and White elders?

Hypothesis: Socio-economic status, medical conditions, health behaviors, social support, and environment are expected to account for racial differences in change of disability.

RQ4. Are there different predictors of change in disability for Black and White elders?

Hypothesis: The pattern of predictors of change in disability are expected to differ between older Blacks and Whites. While socio-demographic characteristics, including age, gender and socio-economic status are expected to have similar effects on disability between older Blacks and Whites, medical conditions and health behaviors are hypothesized to have greater impacts on disability for Blacks, whereas social support and environment are expected to be more important predictors of disability for Whites.

Research Design and Methods

Source of Data

The proposed study will use a data set, MI Choice Information System (MICIS), that was collected by Michigan Department of Community Health. MICIS contains longitudinal penal data of all participants in the Medicaid Waiver program in Michigan. This publicly-funded community long-term care program aims to reduce the demand for institutionalization. It targets people who are low functioning and at risk of nursing home placement. In addition, the Waiver program is means-tested. Only those who are below the income limit can enroll in the program. Assessment begins with a phone screening to identify those who are eligible for further assessment, and follows by an in-person assessment conducted by a team composed of a social

worker and a nurse at the home of the participant. Follow-up assessments, using the same instrument, are conducted every three months. All data collected from these assessments go to the MICIS database through a scanning procedure. The Department of Community Health of Michigan has agreed to support me to pursue the proposed project and grant me access to the data. (See enclosed letter of support from the Department.)

The sample of the study will be restricted to Black and White elderly persons who age 60 or older. I plan to use the data collected from the cohort of elderly who enrolled in the Waiver program between Jan 1, 1999 and December 31, 2000. A total of about 6,500 elderly of the two races joined the program in this two-year period, 20% are Blacks (n=1300) and 80% (n=5200) are Whites.

Data from the 3rd and 21st month assessments of these elderly program participants will be used as the baseline and follow-up measures in the proposed study. That is, changes in disability in an 18-month period will be examined. The initial assessment is not chosen as the baseline because measures taken at that time reflect the elder's situation prior to enrolling in Waiver, which may change after joining the program. For example, instrumental support from informal helpers may decrease when formal services are provided. Using an 18-month interval to examine changes in disability is a compromise between concerns about detectable change and attrition. Studies show that disability (e.g. ADL limitations) has high level of stability. For example, a study of nursing home residents reported that the correlation of T1 and T2 ADL that were measured one year apart is 0.88 (Morris, Fries, and Morris, 1999). In other words, in order to be able to detect changes, the interval between T1 and T2 has to be long enough. However, a longer interval is likely to have more attrition, especially when the sample consists of low functioning older adults. Based on some preliminary analyses of the MICIS data, the attrition

rate in an 18-month period is estimated to be 30-35 %. The greatest attrition happens in the first 6 months after enrolling in the program.

Variables and Measures

Disability. Two indicators of disability will be used.

(1) Activities of daily living (ADL): measured by difficulties in performing routine personal activities of daily life, such as eating and dressing.

(2) Instrumental activities of daily living (IADL): measured by difficulties in performing routine activities around the home or in the community such as meal preparation and house work.

Socio-demographics

(3) Race: Black vs. White.

(4) Age: measured in years.

(5) Gender: female vs. male.

(6) Education: 8 categories from none to graduate school.

(7) Income: assessed by total household income and assets.

Medical conditions

(8) Chronic diseases: 6 chronic conditions will be examined, including endocrine, heart, musculoskeletal, neurological, psychiatric disease, and Alzheimer's disease and other dementia.

(9) Co-morbidity: measured as the number of chronic conditions.

Health behaviors

(10) Alcohol use: assessed by 3 items, whether the elder was told to reduce drinking, had to have a drink first thing in the morning, and number of drinks usually consumed per day.

(11) Smoking: assessed by whether the elder smoked or chewed tobacco daily

(12) Adherence to medication: assessed by degree of compliance with prescribed medication.

(13) Body mass index: measured by height / weight²

Social support

(14) Relationship to caregiver: 4 categories: spouse, adult child, other relative, friend/neighbor

(15) Instrumental support: extent of help received for ADL and IADL from informal helpers.

Environment

(17) Home environment: a checklist was used to assess whether the home environment is hazardous. This checklist has 8 items. Example items are inadequate or no lighting, unsafe flooring and carpeting.

(18) Neighborhood: assessed by the elder's perception of whether safety issue in the neighborhood refrains him/her from going out.

Plan for Data Analysis

For Research Question #1, which asked what are the patterns of change in disability of older Blacks and Whites, I will use three approaches to describe the extent of change. First, the mean level of change in disability between Time 1 and Time 2 will be computed for Blacks and Whites respectively. Second, the sample will be divided into three groups: 1) improvement, 2) no change and 3) decline in functional ability, based on the difference in disability score between Time 1 and 2 (e.g., T2ADL – T1ADL). Percentage in each group for Blacks and Whites respectively will be computed. Third, individual level change in disability will be examined. The difference score will be converted into standard deviation unit. The number and percentage of elders who experience change at each interval defined by standard deviation units (e.g. ½ SD) will be computed for Blacks and Whites respectively.

My second research question asked whether older Blacks and Whites differ in the change of disability. For this question, a different method of data analysis will be used. First,

repeated measures ANOVA will be used to examine whether Blacks and Whites differ in the mean level change of disability. Second, I will compare the percentage of Blacks and Whites in the improvement, no change and decline group, using crosstabs and chi-square statistics. Third, I will run correlations of race and T2 disability, controlling for T1 disability. In order to test whether there is age crossover effect, the analysis for RQ#2 will be conducted with the total sample, as well as within each of the 6 age groups (i.e., 60-64, 65-69, 70-74, 75-79, 80-84, 85+).

For Research Question #3, which asked what accounts for racial differences in the change of disability, I will first run bivariate correlations of all the variables in the study, which will indicate whether Blacks and Whites differ in the hypothesized mechanisms. Then, hierarchical regression analysis will be conducted. The dependent variable is T2 disability. Independent variables will be entered in 6 blocks in the following order. The first block is T1 disability, race, age and gender, which are used as controls. Then socio-economic status measures including education and income will be entered into the model. The third block is medical conditions variables, and the fourth block is health behaviors variables. Social support variables are the fifth block and the last block is environment variables. As each block of variables is entered, changes in the coefficient for race is examined. Substantial change in the coefficient for race indicates that that particular block of variables may account for the relationship between race and changes in disability.

For Research Question #4 which asked whether the predictors of change in disability differ between older Blacks and Whites, I will run regression analysis for the total sample, as well as separately for Blacks and Whites. First, using the total sample, T1 disability, socio-demographics (i.e., race, age, gender, and socio-economic status), medical conditions, health behaviors, social support, and environment is regressed on T2 disability. This model tests the

main effects of the independent variables. Then, I will test whether the effects of the independent variables vary by race. Interaction terms between race and other independent variables (e.g., race X co-morbidity, race X instrumental support) will be created and entered into the model one at a time. Significant coefficient for an interaction term indicates that the impact of the variable that makes the interaction term (e.g., morbidity, instrumental support) on disability varies between Blacks and Whites.

After the total sample analysis, I will conduct separate group analysis to further examine the differential pattern of predictors of disability for Blacks and Whites. The regression model is the same as the main effects model with the total sample, except that race is not in the model because it is a constant and explored separately in the two models.

Limitation and Implication

Similar to many longitudinal studies, attrition is an issue in the proposed study. In particular, attrition due to death and institutionalization may bias the results because these elders are likely to have more increases in disability. I will use the Heckman correction method to adjust for attrition effects (Heckman, 1979).

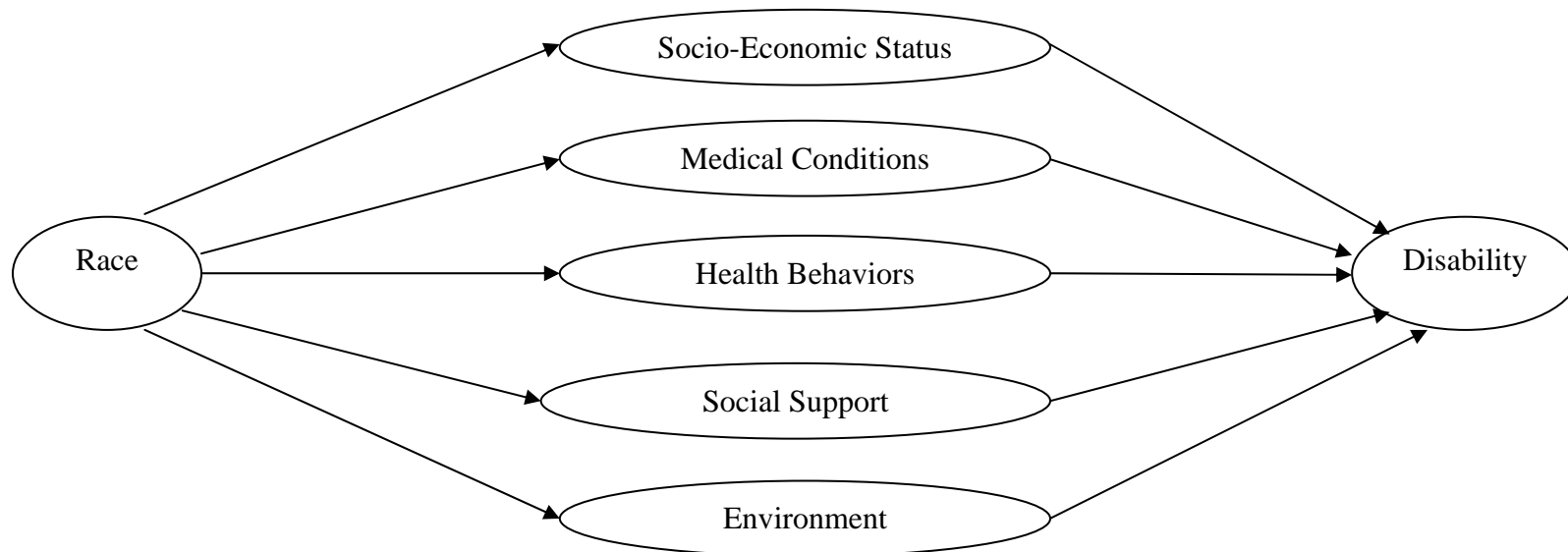
Nevertheless, the proposed study will have implications to policy and practice. At the policy level, it will inform decision makers about effective interventions to prevent and retard functional decline of low-functioning elders in the community, and strategies to reduce racial disparity in health and disability. It also has implications to geriatric social workers, especially those working with ethnic minority elderly. The findings will help social workers to assess the risk of increased disability of their elderly clients and develop intervention accordingly, taking into account of the ethnicity of the elders. Overall, the study will increase our understanding of

racial differences in disability, which should lead to more effective interventions to ameliorate disability within older Blacks and Whites, as well as to reduce the gap between them.

Proposed Timetable

Sept – Dec 2002	Jan – April 2003	May – Aug 2003	Sept – Dec 2003	Jan – April 2004	May – August 2004
Deal with legal and administrative procedures related to using MICIS	Exploratory data analysis	Analyze data for RQ#3	Analyze data for RQ#4	Prepare manuscript (RQ#4) for publication	
Data cleaning	Analyze data for RQ#1 & 2	Prepare manuscript (RQ#1, 2 & 3) for publication		Write grant proposal to continue the research after the Scholars Program ends	
Set up working data files	Submit abstracts (RQ#1 & 2) for professional conferences	Meet with Michigan Department of Community Health to discuss the findings	Presentation at professional conferences	Meet with Michigan Department of Community Health to discuss strategies to disseminate the findings, and future collaborative projects	
Examine psychometric properties of the measures					

Fig. 1 Hypothesized Mechanisms for Racial Differences in Disability



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