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Assessing Longitudinal Impacts of Mentor Role on Student Outcomes

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ASSESSING LONGITUDINAL IMPACTS OF MENTOR ROLE ON STUDENT
OUTCOMES

by

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ABSTRACT

Most youth form relationships with extra-familial adults, sometimes called natural mentoring relationships, and these connections appear to benefit youth in several ways. Previous research demonstrates that the presence of a mentor can positively impact student outcomes including educational expectation, educational attainment, and social success. However, little research has considered how the impact of a natural mentorship may differ based upon the role of the adult in the youth's life. Using data from three waves of the National Longitudinal Study of Adolescent Health, this study investigates if the role of a mentor (i.e. teacher, coach, religious leader) influences the types of benefits that adolescents gain from mentors. I used the Bayesian Additive Regression Trees (BART) model to predict domain specific outcomes in educational expectations, educational attainment, athleticism, and religiosity from the type of mentor and other covariates (e.g., base rates of academic success, fitness, religious beliefs, demographic composition). Findings indicate that the presence of an academic mentor during adolescence predicts increased educational attainment during young adulthood. Other types of mentors, such as athletic mentors or religious mentors, did not have significant impacts in terms of increasing athleticism or religiosity in young adulthood. These results suggest that academic mentors may have more longitudinal impacts on student success than other types of mentors.

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CHAPTER 1

INTRODUCTION

Non-parental helping relationships are a central feature of human growth and development. Evolutionarily speaking, a strong relationship with an adult, either familial or non-familial, provides significantly more protection and resources for survival. As humanity has largely transitioned into an industrial society and developed ecological systems of support, the importance of such relationships are still noted in common adages such as “it takes a village.”

A natural mentor is a non-parental adult who steps outside of his/her typical role to take an increased involvement in a young person’s life by offering advice and support (Jacobi 1991). At a crucial period in development, many adolescents receive significant prosocial and targeted support from mentors. Young people often find natural mentors among the adults in their lives, such as relatives, teachers, coaches, clergy, or employers. For these young people with invested non-parental adults involved in their lives, research demonstrates they are more likely to perform better in school (Rhodes, Grossman & Resch, 2000), are more socially successful (Langhout, Rhodes & Osborne, 2004), demonstrate more positive attitudes toward school (Zimmerman, Bingenheimer, & Notaro, 2002), have higher expectations for educational success (Sanchez, Esparza, & Colon, 2008), and even show higher levels of income (Hagler & Rhodes 2018). These outcomes are consistent across demographics (e.g., gender and socioeconomic status) (Erickson, McDonald & Elder, 2009; Haddad, Chen & Greenberger, 2011). Furthermore,

growing evidence indicates these outcomes are likely sustained beyond the duration of the relationship itself, extending into young adulthood (Hagler & Rhodes, 2018).

Though much is known about the impacts of mentorship, most research is concentrated in examining academic or social outcomes. Less is known about how mentors may impact young people in other areas of identity development, such as athleticism or religiosity. Given many natural mentors are coaches or religious leaders, such knowledge regarding potential outcomes in these domains would inform our conceptual understanding of how mentoring functions outside of the academic sphere. The purpose of the current study is to examine if the role of a mentor (e.g., teacher, coach, religious leader) uniquely impacts within-domain outcomes over time (e.g., academic success, athleticism, religiosity). Further, I aim to investigate several potential covariates, including baseline rates of academic attainment, athleticism, and religiosity, to control for confounding variables. I expect that the domain of the mentor will predict the relative influence of role-related outcomes. I hypothesize that the presence of an academic mentors will positively predict educational expectations and attainment, that the presence of an athletic mentor will positively predict athletic outcomes, and that the presence of a religious mentor will positively predict religiosity.

Mechanisms of Mentorship

Formal models of mentorship identify the close relationship between mentors and mentees as one of the primary mediums through which mentors can influence young people. In 2005, Rhodes developed a model of mentoring that outlines these paths of potential influence. According to this model, successful mentor relationships are “characterized by mutuality, trust, and empathy” (2005). Understandably, mentees often

need time to develop this strong connection with a mentor. When young people see certain adults in their lives frequently and consistently, there are naturally more opportunities to build a relationship into a mentorship. For this reason, teachers, athletic coaches, and religious leaders often become mentors by nature of their frequent contact with youth in a variety of settings.

As a strong relationship transitions into mentorship, the mentor begins to support the youth through a combination of four primary functions: role modeling, teaching, advocacy, and emotional support (Miranda et al. 2016). For the purposes of this study, we highlight this function of role modeling as especially important. A role model is a figure that young people look up to, learn from, and in some cases, emulate in their own lives. For example, we might expect a young person who finds a strong mentor in their soccer coach to adopt mutual values, like physical fitness, to strengthen the foundation of this relationship. As a result, mentors inevitably introduce their mentees to new activities and perspectives by nature of modeling behavior in their own lives.

Mentees are exposed to these opportunities during a crucial period of identity formation; in fact, Rhodes' model of mentoring highlights identity development as a key function of mentorship (2005). The convergence of a strong mentor relationship during this period can lead young people to explore a broader range of "possible selves" (Markus and Nurius, 1986). For example, an academic mentor may introduce the mentee to the possibility of pursuing a career in higher education, potentially shifting the mentee's educational trajectory and self-concept. Natural mentors play a large part in this process solely by introducing mentees to new viewpoints. Given the multiple pathways of influence detailed in Rhodes' model, it stands to reason the identity of a mentor has the

potential what experiences a young person is exposed to, and potentially shift the possible selves a young person envisions.

Benefits of Mentorship

The presence of a natural mentor in adolescence is tied to many important outcomes for young people, especially when it comes to education. Young people with mentors report stronger beliefs that doing well in school is important, which likely contributes to the increased performance in elementary, middle, and high school (Hurd, Sanchez, Zimmerman & Caldwell 2012; Sánchez, Esparza, & Colon, 2008; Wyatt 2009; Herrera et. al. 2007). These benefits also extend into adulthood; the presence of a mentor is associated with increased rate of college attendance and the selection of careers that are intrinsically motivating (Dubois & Silverthorn, 2005; McDonald & Lambert, 2014). Educational expectation and attainment is a predictor of future success, suggesting the presence of a mentor can have lasting impacts beyond academics.

We see extended benefits of mentorship for youth in psychosocial domains as well. The presence of a mentor is associated with increased social success, decreased psychological distress, and increased self-worth (Langhout, Rhodes & Osborne, 2004; Hurd et. al., 2018). Tangible benefits of mentorship include higher levels of civic engagement, including more time spent volunteering in the community (Ben-Eliyahu, Yoviene Sykes, Rhodes 2021; Hagler & Rhodes, 2018). For many youth, the presence of a mentor improves these broad social outcomes by providing increased pro-social support. However, relatively little is known about mentorship benefits in more specific constructs such as athleticism or religiosity, despite the prevalence of these types of natural mentors.

Domains of Mentorship

When mentors are available, young people will develop mentoring relationships (Barajas and Pierce 2001; Hamilton and Hamilton 2005; Mortimer 2003). Increased community involvement, such as on sports teams or in youth groups, is related to more frequent development of non-parental adult relationships, many of whom can become mentors (Scales, Benson, & Mannes 2006). These mentors are considered “weak ties;” weak tie connections are relationships that emerge outside of the direct inner circle of an individual. These connections can be more effective than “strong tie” mentors because they introduce new opportunities, resources, and increase social capital (e.g., role modeling or vocational instruction) (Granovetter, 1973; Hagler & Rhodes, 2018). When youth become adults, they continue to benefit from this social capital and the influence of their natural mentors.

There is a well-documented relationship between academic-based natural mentors, such as teachers, and academic success and educational attainment (Erickson, McDonald, & Elder, 2009; Sanchez, Esparza, & Colon, 2008; DuBois and Silverthorn, 2005). A recent study also indicated that non-academic mentors, such as coaches, similarly improve educational attainment; such findings demonstrate a critical realization that mentorship outcomes can be cross-dimensional (e.g., academic mentors have impacts of education, and non-academic mentors have impacts on education) (Christenson et al, 2019).

Across all types of mentors, the positive impacts of mentorship can be explained through Rhodes’ three areas of developmental growth. In 2016, a group of researchers assessed longitudinal outcomes for adolescents with natural mentors and examined

mentees' qualitative responses for patterns of influence. They noted 19 recurring primary functions of mentorship across 1350 responses, with over 95% of mentoring functions mapping onto the three branches of Rhodes' model (Miranda-Chen et. al. 2016).

Specifically, in the domain of identity development, mentees identified meaningful support such as the development of positive personal attributes/self-esteem, providing support/motivation towards goals, role modeling, and promoting spiritual development (Miranda-Chen et. al. 2016). As young people enter adolescence, a crucial period for identity development, non-parental adults such as mentors become critically important role models with lasting impacts (Allen & Hauser, 1996). In fact, research has suggested that type of mentor (e.g., teacher vs. familial) can change the strength of a mentor's influence (Fruiht & Wray-Lake, 2013). Based on this research, we can hypothesize that teachers, coaches, and religious leaders help mentees to develop a concept of self-identity supported by their shared values by providing social support and resources for the development of related skills.

Teacher-Mentors

Given the amount of time students spend in school each day, it is unsurprising that teacher-mentors are some of the most frequent types of natural mentors. Teachers are explicitly trained to help support students develop cognitive and socio-emotional skills, so they are well-equipped to fulfill the roles of a natural mentor. Teachers and other educators are most strongly associated with positive academic outcomes when compared to other types of natural mentors (Fruiht & Wray-Lake, 2013). Teacher-mentors are also able to provide academic support and have been shown to have lasting influence in terms of educational success (Allen et al. 2006; Sanchez et al. 2008; Fruiht & Wray-Lake,

2013). Past research has demonstrated that these impacts are present over time even when controlling for past academic performance and access to resources (Erickson, McDonald, & Elder, 2009).

Coach-Mentors

For many children, the primary source of physical activity is sports. In the United States alone, 45 million children and adolescents participate in organized sports (Christenson et al, 2019). Coaches play a large role in these sports and help develop youth competence and confidence both within and outside of the realm of athletics. The level of support a coach provides in creating a motivational climate can help or hinder an athlete's motivation and involvement in sports (Alvarez et. al, 2009). Additionally, coaches have been found to have cross-dimensional positive impacts on educational achievement and attainment (Christenson et al, 2019). The relationship between coaches and players is very similar to those of teachers and students, so we might expect to see a similar pattern of influence such that a coach mentor will impact the athletic outcomes of a mentee. For example, youth who demonstrate a high level of physical activity during adolescence are more likely to engage in physical activity during adulthood (Telama et. al, 2005; Huotari et al. 2011); it is possible that involvement in team sports and exposure to athletic mentors contribute to this prolonged level of physical fitness.

Religious Mentors

Like academic-mentors and coach-mentors, religious-mentors have been shown to impact youth education attainment (Erickson & Phillips, 2012). Furthermore, a 2010 survey of adolescents religious mentors were the second most common type of non-familial mentor (Ben-Eliyahu, Yoviene Sykes, Rhodes, 2021). However, very little

research has investigated the role of religious mentors in long-term religious involvement. These findings would be especially important to note during adolescence, as it is a period during which religiosity is likely to decline (Pfund et al, 2020). As adolescents begin to explore their possible selves, they are faced with defining their religious identity as well. Studies have shown that relationships with organized religious leaders are an accurate predictor of involvement with religion and most strong relationships were based in trust and nurturance (Waters & Bortree, 2012). These values are congruent with the model of mentorship presented by Rhodes (2005). Religious leaders can help adolescents to develop their religious identity during a critical period of exploration, which might predict long-term religious engagement.

Challenges in Mentorship Research

Though previous research clearly demonstrates how mentorship is correlated to positive outcomes, it can be challenging for researchers to draw casual inferences. Current research on mentorship and student outcomes often includes a large number of potential confounding variables, such as access to familial support or demonstrate a higher sense of school belonging. Potential covariates are especially important to consider in the present study because access to a normal mentor in one domain likely means a young person spends more time and is more involved in this area to begin with; for example, a student with a religious mentor is likely already involved in their religious community, which may contribute to increased religiosity as they grow older. Given the number of conflated variables and their interconnected nature, it is difficult to parse out the unique influence of a single variable, such as the presence of a mentor. Despite this challenge, it is possible to extricate the influence of one variable from all other

confounding variables using advanced statistical methods. The current study, as detailed below, will utilize a statistical approach in order to investigate the unique contribution of mentor type across domains.

Present Research and Hypotheses

Natural mentors, specifically teachers, coaches, and religious leaders, are in a unique position to impact adolescents in numerous ways. It is well documented that both academic and non-academic mentors' impact academic outcomes for young people. In this study, we will investigate if other types of mentors (coaches and religious leaders) similarly impact athleticism and religiosity of mentees. We will further investigate if the type of mentor has a disproportionate effect on domain-specific outcomes.

We will address this question using the National Longitudinal Study of Adolescent Health (Add Health). This study followed a nationally representative sample of over 20,000 adolescents over the course of two decades in five waves of data. For the purposes of this study, the type of mentor relationship was measured in Wave III and information regarding educational expectations and attainment, physical fitness, and religiosity was collected from Wave IV. Potential covariates, such as baseline rates of educational success, athleticism, and religiosity, were also measured in Waves I and II to control for potential confounding variables. Demographic variables (e.g., race/ethnicity, biological sex, and parental income) were also collected at Wave I. The hypotheses for these research questions are as follows:

Hypothesis 1:

H_0 : The presence of an academic mentor at Wave III will not predict educational expectations at Wave IV. ($\rho_1 = 0$).

H_a : The presence of an academic mentor at Wave III will predict educational expectations at Wave IV, controlling for other possible influences. ($\rho_1 \neq 0$).

Hypothesis 2:

H_0 : The presence of an academic mentor at Wave III will not predict educational attainment at Wave IV. ($\rho_2 = 0$).

H_a : The presence of an academic mentor at Wave III will predict educational attainment at Wave IV, controlling for other possible influences. ($\rho_2 \neq 0$).

Hypothesis 3:

H_0 : The presence of an athletic mentor at Wave III will not predict athletic outcomes at Wave IV. ($\rho_3 = 0$).

H_a : The presence of an athletic mentor at Wave III will predict athletic outcomes at Wave IV. ($\rho_3 \neq 0$), controlling for other possible influences.

Hypothesis 4:

H_0 : The presence of a religious mentor at Wave III will not predict religiosity at Wave IV. ($\rho_4 = 0$).

H_a : The presence of a religious mentor at Wave III will predict religiosity at Wave IV. ($\rho_4 \neq 0$), controlling for other possible influences.

CHAPTER 2

METHOD

Participants

For this study, data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) was analyzed. The Add Health study is a multi-survey, multi-wave design aimed to directly measure the impacts of social context on youth health and health behavior. The Add Health dataset collected five waves of data over 24 years relating to adolescent school performance, mental and physical health, family and peer relationships, neighborhood and school characteristics, and child outcomes (Harris et. al, 2009). The study is a nationally representative sample of adolescents in the United States; participants were in grades 7 through 12 at 80 U.S high schools and 52 middle schools during the initial data collection phase in 1994-1995. At Wave III, participants provided information on mentoring relationships; at this point, there was a sample of 15,197 participants aged 18-26. Wave IV of data collection occurred six years after Wave III and included information about participant's academic, athletic, and religious outcomes; at this time, there was a sample of 15,701 participants aged 24-32. There was a relatively even gender split across all waves of data collection and the sample was representative of racial/ethnic diversity (see Table 2.1). To examine potential covariates, data reported by participants and participants parents at Wave I and II of data collection was also used.

Table 2.1 Sample Demographics

Racial Identity (Wave I)	Number of Participants	Percent of Sample
White	5693	62.4%
Black/African-American	3412	22.5%
Asian or Pacific Islander	1195	7.9%
American Indian or Native American	544	3.6%
Other	1359	8.9%
Multiracial	744	4.9%
Ethnic Identity (Wave I)		
Hispanic or Spanish/Latin Origin	2447	16.2%
Not Hispanic or Spanish/Latin Origin	12681	83.82%
Gender (Wave III)		
Male	7167	47.2%
Female	8030	52.8%

Measures and Covariates

The broad Add Health study surveyed adolescents and their parents for information about family, community, school, peer relationships, romantic relationships, physical fitness, religious beliefs, and health outcomes. For this study, data from Wave III was used as predictors, data from Wave IV was used as outcome variables, and data from Waves I and II was used as potential covariates.

Domain of Mentor. To determine the domain of a mentor, I used participant responses to the question presented in Wave III, “How is [name of mentor] related to you? If there has been more than one person, describe the most influential.” Individuals who responded with “teacher/guidance counselor” were coded as “academic mentor” (n = 2223), individual who responded with “coach/athletic director” were coded as “athletic

mentor” (n = 447), and individuals who responded with “minister/priest/rabbi/religious leader” were coded as “religious mentor” (n = 410).

Academic Outcomes. Academic outcomes were assessed in two distinct variables: educational expectations and educational attainment. To assess academic expectations, in Wave IV participants were asked “What is the highest level of education you ever expect to complete?” and provided responses from multiple choice options that ranged from “finish high school or earn GED” to “professional doctorate.” To assess educational attainment, in Wave IV participants were asked “What is the most recent degree you have received?” and provided responses from multiple choice options that ranged from “have not received a degree” to “professional doctorate.” Descriptive statistics for these outcome variables can be found in Table 2.2.

Athletic Outcomes. Athletic outcomes were assessed through the creation of a composite score for athleticism and physical fitness. The composite score was created from participant responses to seven questions regarding frequency of physical activity in several categories including individual sports, team sports, and recreation. All components of the composite score were answered using the same scale, so the composite was created by adding all responses to create a single score. The questions included in the composite can be found in Appendix A and descriptive statistics for this outcome variable can be found in table 2.2.

Religious Outcomes. Religious outcomes were assessed through the creation of a composite score for religiosity. The composite score was created from participant responses to four questions regarding the frequency of their religious activity and the importance of their beliefs. The components of the composite score were answered on

differing scales, so each question was standardized prior to creating an average score across all four variables. The questions included in the composite can be found in Appendix A and descriptive statistics for this outcome variable can be found in table 2.2.

Covariates. It is noted there is the potential for bias in the analysis of differential domains. For example, adolescents who are actively involved in athletics are likely to have more opportunities to find a mentor who is a coach. Given this potential for confounding variables, we identified other variables that were plausibly related to each outcome. We included 24 potential covariates in both academic models, 31 potential covariates in the athletic model, and 28 potential covariates in the religiosity variable. These predictors included demographic information of the youth, parental income, and baseline variables of academic success, athletic involvement, and religiosity at Waves I and II. For more information of the descriptive statistics for each potential covariate, interested readers should visit the Add Health data codebook explorer on the Add Health website (Add Health).

Table 2.2 Descriptive Statistics

Outcome Variable	Mean	Std. Dev.	Skew	Kurtosis
Educational Expectation – “What is the highest level of education you ever expect to complete?”	5.56	2.01	-0.82	0.01
Educational Attainment – “What is the most recent degree you have received?”	2.93	1.74	.62	-0.08
Athletic Outcome – Additive composite response to questions in Appendix A	6.22	5.93	1.59	3.83
Religious Outcome – Scaled composite response to questions in Appendix A	0	0.86	0.22	-0.9

Procedures

Data Analytic Plan. As previously described, longitudinal mentorship studies often have many variables that are intertwined, making it difficult to attribute causality or decidedly note the contribution of a single variable. For this reason, a machine learning approach is an excellent fit for this analysis because they provide more accurate predictions than traditional statistical models when considering a number of confounding variables (Kapelner and Bleich, 2013). For my analysis, I used a machine learning algorithm called the Bayesian Additive Regression Trees (BART).

BART is an approach that predicts outcomes for non-linear relationships while taking potential confounding variables into account. Using the input data, this model creates a group of algorithms similar to a pyramid of regression trees. Each subsequent regression tree is tested using many different decision rules, or regression equations, to determine the best predictor values. The possible decision rules appear as arbitrary division points within each variable. For example, the model might consider if annual parental income is greater than \$100,000 by partitioning the data into two subsamples: one for participants with a parental income lower than the threshold, and one for participants with a parental income greater than the threshold. Each subsample is then split again, into four groups, then into eight groups, and so on until the model reaches a predetermined stopping point.

After the algorithm tests each set of equations against the decision rules, it creates a cumulative equation that represents each tested model. Each individual regression tree, or variable, is then analyzed using the cumulative equation for importance relative to other predictors. For each predictive variable, the model provides

both a pseudo R^2 value represents the partial prediction, controlling for other variables, as well as an estimate of overall importance. The variable importance is reported as the proportion of times the variable splits improved accuracy of predictions relatively to the total number of predictions. Readers interested in learning more about machine learning algorithms or the BART model should review Chipman et al (2010) or Kapelner and Bleich (2013) for more in-depth analyses of these approaches.

For this study, we used four BART models to account for the four distinct outcome variables. The educational expectation BART model included educational expectation as the outcome, the presence of an academic mentor as the primary predictor, and a set of 24 variables as potential covariates (see Figure 3.1).

The educational attainment BART model included educational attainment as the outcome, the presence of an academic mentor as the primary predictor, and a set of 24 variables as potential covariates (see Figure 3.2).

The athletic BART model included the composite athletic score as the outcome, the presence of an athletic mentor as the primary predictor, and a set of 31 variables as potential covariates (see Figure 3.3).

The religious BART model included the composite religiosity score as the outcome, the presence of a religious mentor as the primary predictor, and a set of 28 variables as potential covariates (see Figure 3.4).

CHAPTER 3

RESULTS

Educational Expectations

The overall pseudo R^2 of the educational expectation model including all predictors was .287, which indicates that 28.7% of the variance in reported educational expectation was accounted for by the 25 predictors. This means that most of the variance is unexplained by these variables, but some variables were more important than others. A graphical display of variable importance is found in Figure 3.1. Variable importance is described in terms of an inclusion proportion; the inclusion proportion is the number of times a specific variable was used as a key split point in the BART model out of all possible split points (Kapelner and Bleich 2013). A larger inclusion proportion suggests the variable is more important in terms of predictive value. The top five variables in order of importance are as follows: (1) Parental Income; (2) Self-reported chance of graduating college at Wave II; (3) Self-reported likelihood of attending college at Wave I; (4) Social Studies grade at Wave I; (5) ELA grade at Wave I. The presence of an academic mentor was the 13th most important predictor.

After analyzing variable importance, we tested the statistical significance of the presence of an academic mentor while controlling for all other indicators. When

controlling for all other variables, the presence of an academic mentor was not a statistically significant influence on educational expectations ($p = .079$).

Educational Attainment

The overall pseudo R^2 of the educational attainment model including all predictors was .267, which indicates that 26.7% of the variance in reported educational attainment was accounted for by the 25 predictors. Some variables emerged as more important predictors than others. A graphical display of variable importance is found in Figure 3.2 and represented by inclusion proportions. The top five variables in order of importance are as follows: (1) Parental Income; (2) Social Studies grade at Wave I; (3) Science grade at Wave I (4) Math grade at Wave I; (5) ELA grade at Wave I. The presence of an academic mentor was the 10th most important predictor.

When controlling for all other variables, the presence of an academic mentor was a statistically significant influence on educational attainment such that the presence of an academic mentor increased mentee educational attainment ($p < .00$).

Athletic Outcomes

The overall pseudo R^2 of the athletic mentor model including all predictors was .161, which indicates that 16.1% of the variance in reported athletic outcomes was accounted for by the 32 predictors. Despite noise in the model, some variables emerged as more important predictors than others. A graphical display of variable importance is found in Figure 3.3 and represented by inclusion proportions. The top five variables in order of importance are as follows: (1) Recreation activity at Wave III; (2) Fitness Center usage at Wave III; (3) Walking for exercise at Wave III; (4) Strength training at Wave III;

(5) Team Sports at Wave III. The presence of an athletic mentor was the 14th most important predictor.

When controlling for all other variables, the presence of an athletic mentor was not a statistically significant influence on athletic outcomes ($p = .119$).

Religiosity

The overall pseudo R^2 of the model including all predictors was .493, which indicates that 49.3% of the variance in reported religious outcomes was accounted for by the 29 predictors. This suggests the variables in this model account for nearly half of the variance; still, some variables were more important predictors than others. A graphical display of variable importance is found in Figure 3.4 and represented by inclusion proportions. The top five variables in order of importance are as follows: (1) Religious Service Frequency at Wave III; (2) Prayer Frequency at Wave III; (3) Religious Importance at Wave III; (4) Time spent in Religious Activity at Wave III; (5) Spiritual Importance at Wave III. The presence of a religious mentor was the 19th most important predictor.

When controlling for all other variables, the presence of a religious mentor was not a statistically significant influence on religiosity ($p = .406$).

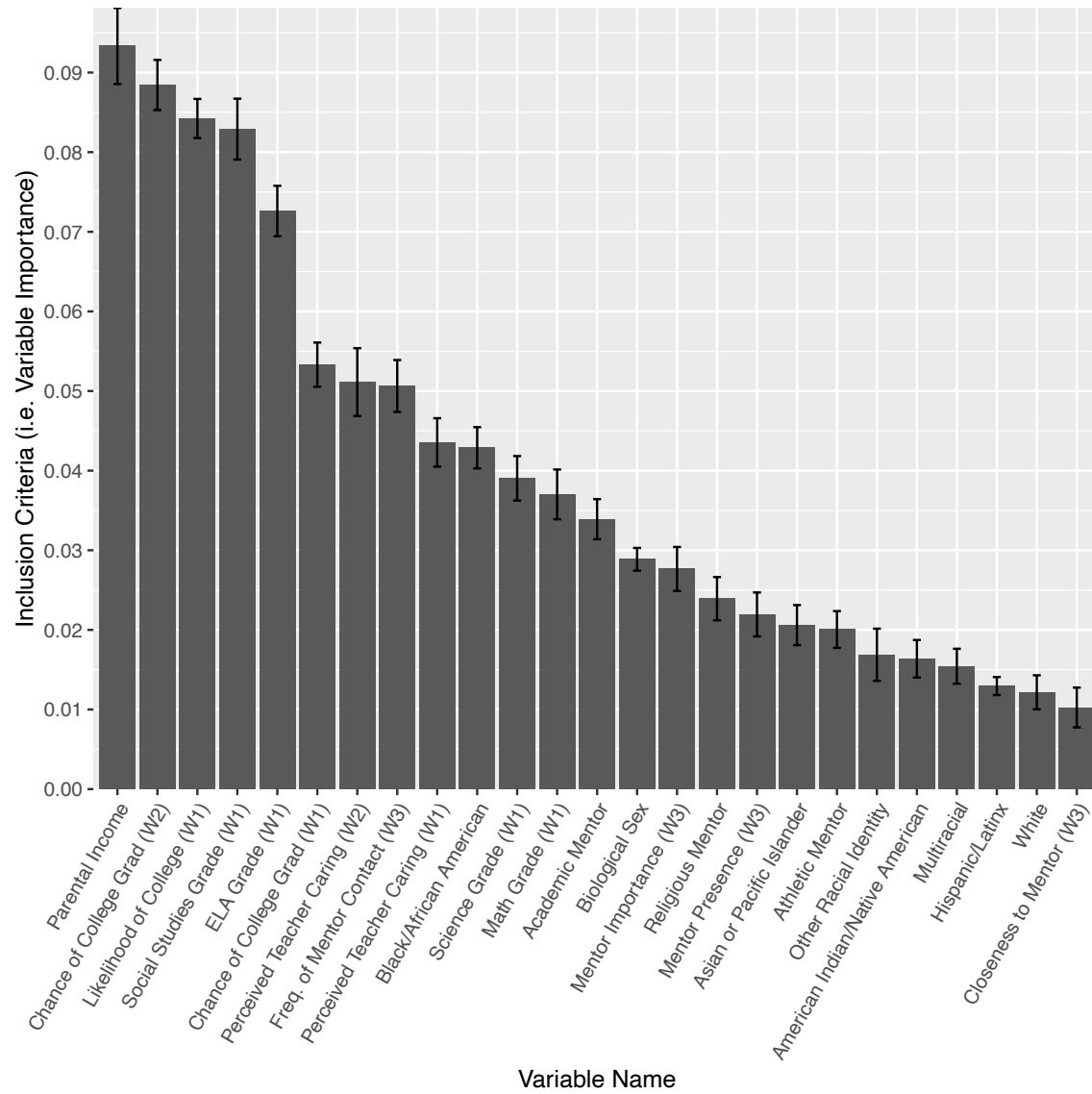


Figure 3.1 Variable Importance Graph for Educational Expectations

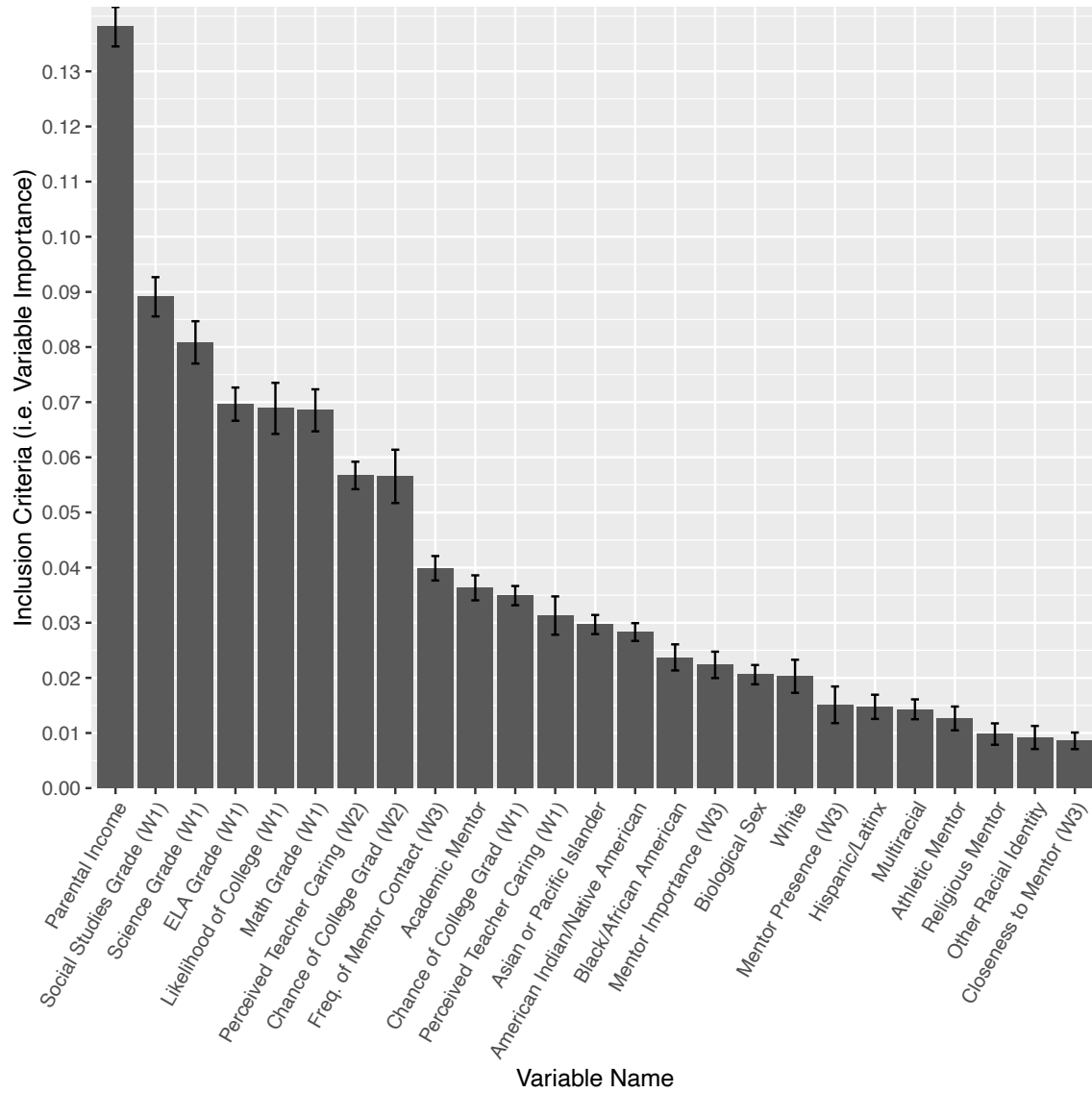


Figure 3.2 Variable Importance Graph for Educational Achievement

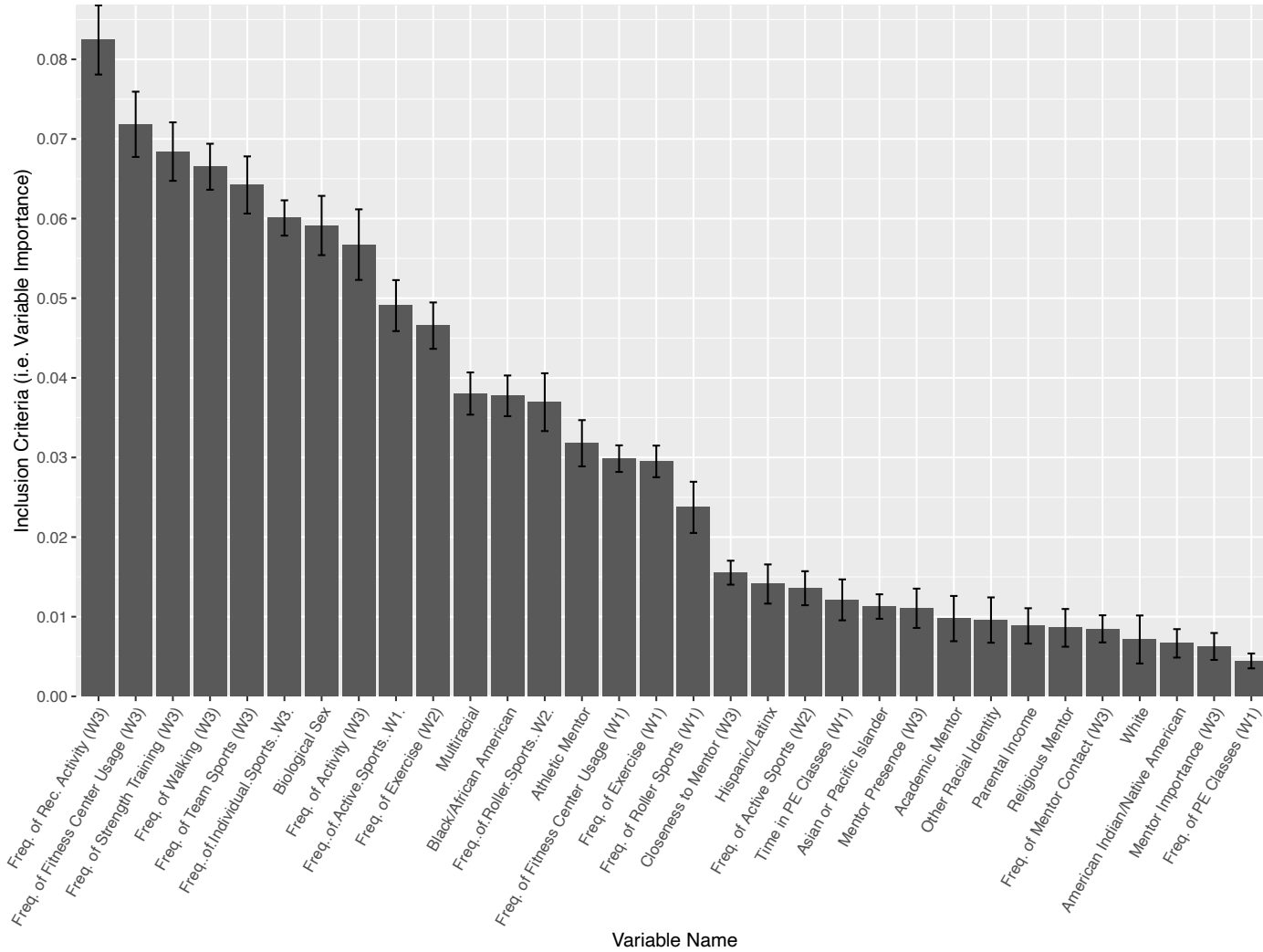


Figure 3.3 Variable Importance Graph for Athletic Outcomes

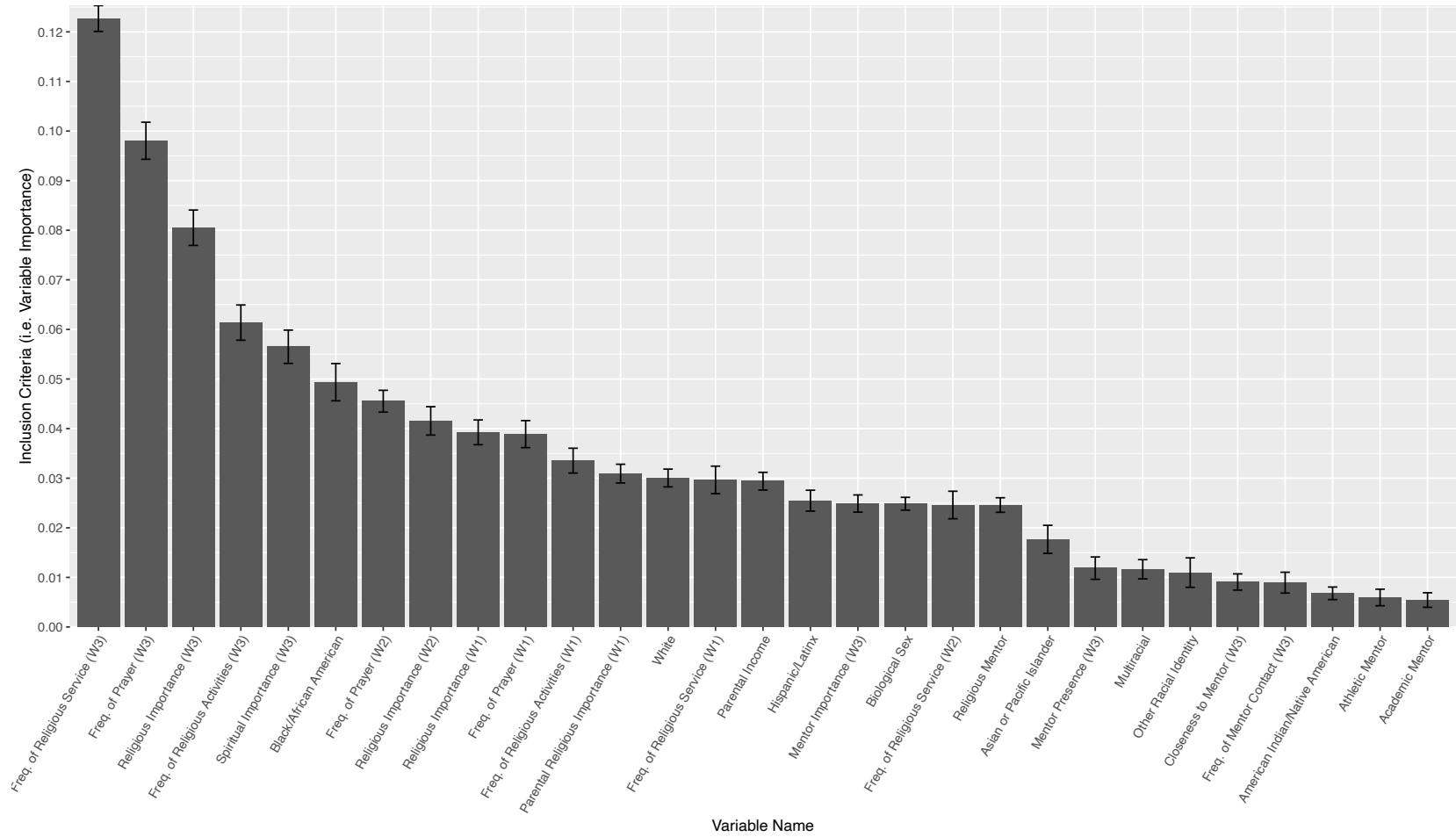


Figure 3.4 Variable Importance Graph for Religiosity

CHAPTER 4

DISCUSSION

I hypothesized that natural mentors have differential impacts on longitudinal outcomes of mentees based upon their domain of influence such that academic mentors impact academic outcomes, athletic mentors impact athletic outcomes, and religious mentors impact religious outcomes. I used the National Longitudinal Study of Adolescent Health dataset to investigate this prediction by determining the extent to which the type of mentor predicted longitudinal domain-specific outcomes. The four primary analyses yielded important findings regarding the impacts different types of mentors have on young people.

First, the presence of an academic mentor predicts higher educational attainment later in life. Though there are many confounding variables that could influence a young person's educational attainment, this finding remains statistically significant when controlling for 24 potential covariates including parental income, school performance, self-reported academic expectations, and demographic characteristics such as race and biological sex. This finding is important because it supports the ecological validity of previous research evidence that there are educational benefits for young people involved in mentorship relationships. Young people with mentors are more engaged in school and are more likely to complete high school and college (Hurd & Sellers, 2013; Dubois &

Silverthorn, 2005). It is important to acknowledge that the presence of a natural mentor is not a randomly assigned condition, and thus has other selection factors that contribute to the impacts of mentorship. Some studies investigate the potential covariates of mentorship as moderators in multiple regression models, and find that sociodemographic factors, such as race/ethnicity, environmental risk factors, and family income, can moderate the impact of mentorship (Reynolds & Parrish, 2018; Erikson et. al., 2009; Fruht & Wray-Lake, 2013). The statistical method used in this analysis is unique in that the model can account for a larger number of covariates and is less susceptible to overestimation of effect, providing a more realistic estimation of the unique contribution of a single predictor variable. The findings of this study demonstrate that the presence of an academic mentor does independently contribute to the educational attainment of youth even when considering all the other selection factors that co-occur with mentorship.

Though the presence of an academic mentor predicted increased educational attainment, this study also noted that academic mentors did not have the same unique impact on academic expectations such that the presence of an academic mentor did not significantly alter a young person's expected level of education. Given the statistical methods used in analysis, this finding suggests that the unique and independent contribution of an academic mentor on education expectation is not consistent enough when controlling for all other variables. Previous research has shown that in some cases, the presence of a mentor does not significantly impact the educational attainment levels for individuals with higher socio-economic backgrounds (Reynolds & Parrish, 2018). It is likely that parental income is a critical element to educational expectation, and thus the presence of a mentor did not appear significant in this analysis without the presence of

this moderator in the model. This is noteworthy when considering the significant finding on educational attainment. The contrast in significant findings in the two academic outcome variables suggests that the unique contribution of mentorship is stronger for supporting students to achieve a certain level of education, but not in adjusting their educational expectations. It is also worth noting that there is likely a ceiling effect in that more people received a Bachelor's degree, but fewer attend higher education levels (e.g., Masters, professional degree, doctorate, etc.) (Staff, 2019).

Another important finding of this study is that the presence of athletic or religious mentors do not predict longitudinal outcomes in athleticism or religiosity. This is an important finding because academic mentors are more likely to predict longitudinal outcomes in education when compared to mentors of other domains (Fruht & Wray-Lake, 2013). Models of mentorship have shifted in recent years to include understanding of larger natural mentoring networks, specifically as it relates to the existing environments where young people find mentors (Hagler, 2018). Given many young people spend a large proportion of time involved in athletic or religious activities, their social network frequently includes mentors from these communities. The finding that athletic and religious mentors did not have larger impacts on outcomes in their domains contradicted my hypothesis. It is possible that the impact of the covariates in the model, such as baseline levels of athleticism and religiosity, are stronger than the unique contribution of a mentor in this area.

Limitations

It is important to note several limitations in this study. First, I was able to include such a large number of potential covariates due to the use of an extensive dataset.

However, as this was a secondary analysis of existing data, I was limited to the questions and information collected in the initial survey. As a result, there were slight differences in measures at each wave of data collection. For example, questions regarding physical activity were phrased differently at Waves I, II, and III and questions regarding religious involvement required responses on differing scales. To mitigate such limitation, I applied statistical techniques such as including each question at Waves I and II as a separate predictor rather than creating a mismatched composite, and I applied a standard scale to the questions regarding religious involvement prior to creating the outcome composite. Another limitation, related to the use of extant data, is that I was limited to controlling for covariates that were measured during the initial survey. Given the high probability that mentorship is related to a number of other variables, I attempted to control for a large number of common covariates in order to increase the validity of analyses. Finally, as the data for this study was taken from a longitudinal survey and not a randomized control trial, the ability to note causation is also limited.

Conclusions and Future Directions

When considered altogether, this study provides findings that have the potential to provide large impacts for both future mentoring research and practical mentor programs. Previous research notes the extensive benefits of mentorship in conjunction with several covariates and moderators. This study expands upon the previous research by isolating the unique contributions of mentorship to determine that the presence of a natural mentor is a predictor of youth educational attainment with unique and independent contributions to the model of influence.

These findings are important for both future research directions and practical development of mentoring initiatives. In the realm of research, this study provides an example of how advanced statistical methods can be utilized in large datasets in order to account for large networks of potential variables. As researchers gain access to more longitudinal data sets that include information about mentoring, it is important to utilize the most appropriate statistical analyses to ensure we are addressing key questions from an empirical evidence base. In terms of practical applications, there are many formal mentoring programs that specifically pair mentees with trained community mentors that come from a number of different fields and backgrounds. If we understand how natural mentors influence mentees in different ways, then perhaps we can better engineer program sponsored mentoring relationships to maximize these influences based on the characteristics, preferences, and needs of young people.

Overall, the influence of mentorship often works in tandem with a number of other environmental, individual, and sociodemographic characteristics to influence the trajectory of a young person. Understanding the unique contribution of any single factor is important for the development of strong, evidence-based programs that provide young people of all backgrounds with the most opportunities for success.

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APPENDIX A

COMPOSITE QUESTIONS

Athletic Outcomes

In the past seven days, how many times did you bicycle, skateboard, dance, hike, hunt, or do yard work?

In the past even days, how many times did you roller blade, roller skate, downhill ski, snow board, play racquet sports, or do aerobics?

In the past seven days, how many times did you participate in strenuous team sports such as football, soccer, basketball, lacrosse, rugby, field hockey, or ice hockey?

In the past seven days, how many times did you participate in individual sports such as running, wrestling, swimming, cross-country skiing, cycle racing, or martial arts?

In the past seven days, how many times did you participate in gymnastics, weight-lifting, or strength training?

In the past seven days, how many times if you play golf, go fishing or bowling, or play softball or baseball?

In the past seven days, how many times did you walk for exercise?

Religious Outcomes

How often have you attended church, synagogue, temple, mosque, or religious services in the past 12 months?

How important (if at all) is your religious faith to you?

How often do you pray privately, that is, when you're alone, in places other than a church, synagogue, temple, mosque, or religious assembly?

How often do you turn to your religious or spiritual beliefs for help when you have personal problems, or problems at school or work?