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Family Relationships and Academic Performance via Belongingness among Cuban Medical Students: Examining Family Legacy and Sex as Moderators

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Family Relationships and Academic Performance via Belongingness among Cuban Medical Students: Examining Family Legacy and Sex as Moderators

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Table of Contents

Page

List of Figures……..6

List of Tables……...7

Abstract……8

Introduction……..9

Cuban Context and Relations between Cuba and the United States …….10

The Direct Relation between Family Relationships and Academic Performance ...…….12

Relations between Family Relationships and Belongingness ……..…….14

Relations between Belongingness and Academic Performance …...……16

Belongingness as a Mediator …….……...17

Family Legacy and Sex Differences as Moderators ……..……...18

Family legacy differences ……...…...……...18

Sex differences ……..…….……...20

The Current Study and Hypotheses …….…..……...21

Method…….....21

Participants……....21

Procedure…….....22

Measures……....22

Data Analytic Plan…….……24

Power Analysis ……..…….……..24

Preliminary analyses…...…….……..24

Analytic approach……...…….……..25

Main research questions..……..25

Mediation…….. ……..26

Results……26

Discussion……..28

Relations between Family Relationships and Belongingness ……..…….28

Relations between Belongingness and Academic Performance …...……30

Belongingness as a Mediator …….……...34

Family Legacy as a Non-Significant Moderator….. ……..……...35

Limitations, Future Directions, and Conclusion…….……...37

References……..40

Appendix: Research Measures……..49

List of Figures

Page

Figure 1. Conceptual model examining the mediating role of belongingness in the association between family relationship on academic performance among Cuban Medical students, with sex and family legacy included as moderators.……49

Figure 2. Final Partially Constrained Multigroup Model of Family Relationships Predicting Academic Performance via Belongingness among Female (n = 335) and Male (n = 278) Medical Student…..……..…….……..…….50

List of Tables

Page

Table 1. Means, Standard Deviations, and Correlations among Study Variables and Controls for Cuban Medical Students (N = 637)……..……51

Table 2. Means, Standard Deviations, and Correlations among Study Variables and Controls for Female (n = 335) and Male Students (n = 278)…….....52

Table 3. Nested Model Comparisons and Chi-Square Difference Tests for Constraints Imposed Across Females and Males.....53

Abstract

Medical diplomacy is a foundational part of Cuban domestic and foreign policy (Feinsilver, 2010). Cuba has an abundance of doctors, encouraged by the country's free medical education program (Hand et al., 2020), and has made a significant impact with its well-established healthcare system, provision of healthcare for all of its citizens, and healthcare support internationally. The current study aims to focus on processes underlying Cuban medical students' academic performance, as they are a critical component of this successful system, and a population that has received limited empirical attention. Thus, the current study used path analyses to examine the relations between improved family relationships and academic performance mediated by belongingness and moderated by family legacy (i.e., having family members working in the medical field), and sex differences among Cuban medical students (N = 637) residing in Cuba (M age = 21.36, SD = 2.04). We found that improved family relationships significantly predicted increased belongingness to the field of medicine which, in turn, predicted increase perceptions of academic performance for Cuban medical students, this mediation only held for male and not female students. In other words, only male medical students with improved family relationships reported more feelings of belonging to the school of medicine and higher academic performance, this was not true for female students. Discussion on societal implications for sex differences will be addressed. Limitations, implications, and future direction will be further discussed.

Family Relationships and Academic Performance via Belongingness among Cuban Medical Students: Examining Family Legacy and Sex as Moderators

Medical diplomacy is a foundational part of Cuban domestic and foreign policy (Feinsilver, 2010). Access to healthcare in Cuba is universal and state funded, and Cuba provides medical assistance to more than one hundred countries for short-term emergencies and on a long-term basis. Cuba has provided free medical education for foreign students to contribute to the sustainability of other countries' health programs (Feinsilver, 2010). Further, Cuba has an abundance of doctors, encouraged by the country's free medical education program (Hand et al., 2020). Cuba has made a significant impact with its well-established healthcare system, provision of healthcare for all of its citizens, and healthcare support internationally. The current study aims to focus on processes underlying Cuban medical students' academic performance, as they are a critical component of this successful system, and a population that has received limited empirical attention.

The government in Cuba recognizes that the future of their society is intricately tied to the health and education of their youth (Steinmetz, 2005). Cuba consists of a collectivistic structure in which family relationships are an integral aspect of development (Galati et al, 2004). Thus, in understanding medical students' academic performance, it is important to consider the ways in which medical students are connected to and supported by their families. Although some work has tested associations among Cuban individuals in the United States (e.g., Cutrona et al.,1994; LeCroy & Krysik, 2008; Lopez & Vazoquez, 2002), no work to date has tested how family relationships inform academic performance among Cuban medical students.

Furthermore, not only is it important to examine how family impacts academic performance, but research is needed that tests the mechanisms (e.g., moderators and mediators)

that play a role in this association. For example, among a sample of Latinx high school students (which included Cuban youth), school belongingness mediated the relation between family involvement and academic adjustment (Kupermind et al., 2008). Among medical students in medical school, families may provide a secure and attached foundation, which may then translate into feeling a sense of attachment and connection with their profession, which may then inform their ability to do well in medical school. Lastly, both family legacy (i.e., having family members in one's field) and sex (i.e., identifying as female or male) has impacted belongingness and academic performance, and these factors may also moderate the mediation process from family relationships to academic performance via belongingness.

No work has tested this full moderated mediation process; however, previous work provides support for parts of this model, such as the association between family relationships and belongingness, and between belongingness and academic performance. Below, I detail previous empirical work, identify gaps, and highlight the goals of the current study by providing (a) a contextual description of Cuba and relations between Cuba and the United States (U.S.) , (b) the direct relation between family relationships and academic performance, (c) relations between family relationships and belongingness, (d) relations between belongingness and academic performance, (e) belongingness as a mediator, and (f) family legacy and sex differences as moderators.

Cuban Context and Relations between Cuba and the U.S.

Relations between Cuba and the U.S. have been strained for more than 60 years. Since 1959, the U.S. has implemented sanctions on Cuba in an attempt to isolate the country economically and diplomatically, longer than any other country (Council on Foreign Relations, 2021). This was the case until December 2014 when President of the U.S., Barack Obama, and

the Cuban president at the time, Raul Castro, announced that they would restore full diplomatic ties. Before leaving office, President Obama reopened the embassy in Havana, allowed commercial flights between the two countries, and Cuba was removed from the State Department's terrorism list of state sponsors of terrorism (Council on Foreign Relations, 2021). In 2021, these policies were then reversed by the U.S. Trump administration, and the relations between the two countries were severed once again (Council on Foreign Relations, 2021).

The political climate between the two countries has made it difficult for scientific collaboration, though there have been exceptions. For example, in 1980 there was an agreement between the U.S. Smithsonian Institution and the Cuban Academy of Sciences to build on past shared resources, challenges, and abilities (Pastrana, 2015; Ronda-Pupo, 2021). Later, in the 1990s, a similar scientific agreement followed between Cuban Academy and the New York Botanical Garden, Social Sciences Research Council, and other centers and universities (Pastrana, 2015). In 2014, the American Association for the Advancement of Science and the Cuban Academy agreed to jointly focus on biomedical research in cancer, infectious diseases, drug resistance, and neurosciences (Council on Foreign Relations, 2021). Though, the political environment between the two countries has made it difficult for collaborations between scientists in the U.S. and Cuba, a study that assessed U.S.-Cuba collaborations found that both scientific communities have increased their collaborative efforts to solve scientific questions of primary common interest, regardless of the prohibitions imposed by U.S. Embargo on Cuba and the political party in the Oval Office (Ronda-Pupo, 2021).

The Obama administration's lowering of barriers has had the largest positive effect on Cuban collaborative scientific relationships (Ronda-Pupo, 2021). One product of this grace period lead to new insight into Cuban life recorded by academics traveling to Cuba. Notes on

first-hand experiences of Cuba's education system state that Cuba's education system is national and rooted in the political system of the country. In Cuba it is mandatory to attend school up to 9th grade, where the average education level is 10th/11th grade (Cruz, 2017). After 9th grade, students in Cuba have the option of attending pre-university school 10th-12th grade (the most common path selected), which works as a college pathway to various careers at a university (e.g., medicine, engineering, education), or going to a trade school. In order to enter pre-university schools, an entrance exam must be taken that assesses knowledge and skills in the basic areas of Spanish, mathematics, and science (Cruz, 2017). Women are guaranteed equal educational opportunities and consist of more than half of university graduates (Levinson, 2021). Cuba maintains one of the highest literacy levels in the world, and it boasts one of the world's best health systems, with every citizen having access to healthcare (Cole et al., 2018).

Cubans are the third largest Latinx group in the U.S, tied with Salvadorans (Noe-Bustamante, 2019). Most scholarly studies assessing Latinx individuals in the U.S. focus on Mexicans because they are 62% of the Latinx population in the U.S. (Noe-Bustamante, 2019). Cubans share similarities with other Latinx groups, such as shared overall culture, values, and language (Galati et al., 2004; Gateway to Health Communications, 2021). It is misleading to suggest that all Latinx groups are the same because they each contain cultural diversity that results from unique histories and contexts that distinguish them (Gateway to Health Communications, 2021). Recognizing individuality, but also commonality, the current study cites work with Cubans when it has been conducted, but also draws from research with other Latinx subgroups to provide empirical support for the expected relations in the current study.

The Direct Relation Between Family Relationships and Academic Performance

Relationships with family among emerging adults of color have been found to be protective (Freeberg & Stein, 1996; Hong et al., 2021; Moilanen & Raffaelli, 2010). Emerging adulthood is a transition stage into adulthood where a person (18-25 years of age) experiences various changes, including going on to higher education (Arnett, 2000). For Latinx college students, including Cuban Americans, family has been found to be central to their social support during this developmental period, as students are often still connected emotionally and financially with their families (Freeberg & Stein, 1996; Moilanen & Raffaelli, 2010). Latinx emerging adults have been found to engage in frequent interactions with their family system and rate their parental support higher than peer support (Freeberg & Stein, 1996; Moilanen & Raffaelli, 2010). Further, supporting literature indicates that family members are repositories of various types of support, such as listening, caregiving, and attention (Gottlieb & Bergen, 2010).

Although family members have been found to be important in general to Latinx emerging adults, there have been mixed findings in the literature regarding the impact of family support on emerging adults' academic outcomes. Studies have found that family support is related to higher grade point average of middle school, high school, and university students (Cutrona et al.,1994; LeCroy & Krysik, 2008; Li & Casillas, 2017; Lopez et al., 2002; Wang et al., 2014). For example, among 418 university students, family support was found to significantly predict academic achievement rather than friends or romantic partners (Cutrona et al., 1994). Further, among adolescents, family involvement has been found to increase over time while predicting academic performance (Li & Casillas, 2017; Wang et al., 2014).

Yet, a study done with medical students in the U.S. found that more outside social support (e.g., parental support, friend support, partner support) was related to lower academic performance of medical students (Rospenda et al., 1994). Even though this study focused

specifically on medical students, it did not assess the individual effects of family support, which is particularly important for Cuban students. Different findings may emerge when specific relationships with family are assessed in relation to academic performance among Cuban medical students.

Although previous work, albeit some of it mixed, supports the direct link from family relationships and academic performance, it is important to understand potential mechanisms that may account for this relation, such as belongingness. No study has tested the mediational process by which family relationships is associated with perceptions of academic performance *through* belongingness in the medical field. However, previous work supports this mediational process by testing aspects of this model in terms of (a) family relations and belongingness, and (b) belongingness and academic performance.

Relations between Family Relationships and Belongingness

Regarding the first part of the mediation process, existing work provides some support for the relation between family relationships and belongingness. Maslow (1943) first conceptualized the need to belong as one of five fundamental human experiences. School belonging (or belongingness) has been defined as a psychological construct that involves students feeling personally accepted, respected, included, and supported by others in the school social environment, and applies to both secondary school and university settings (Goodenow & Grady, 1993; Slaten et al., 2016). In the belongingness literature, there is consistency in the use of the definition, but a varied use of the terminology to describe it (Slaten et al., 2016), including the terms *school connectedness, school bonding, school identification, school attachment, and a sense of community*, or *belongingness*. In the current study we use the term *belongingness*, and when discussing previous literature, we use the term that authors included in their study.

A theory that is useful for understanding the benefits of family relationships to school belongingness is social capital theory (McNeal, 1999). Social capital theory (Bourdieu, 1986; McNeal, 1999) has conceptualized social capital as containing three elements, including social ties between family members (e.g., parents and their children), norms of obligation and reciprocity, and educational support. Thus, a contagion effect may occur, such that students see and model their parents', siblings' or other family members' positive views of schooling, such attitudes, behaviors, and enjoying and being comfortable in school settings. Therefore, when Cuban medical students have better family relationships, they may be more likely to see positive views on education from others, which they may internalize to feel more comfortable and have a sense of belongingness in medical school.

Existing work supports this notion among Latinx youth in early to late adolescence. Garcia-Reid (2007) found that support provided by Dominican, Mexican, and Puerto Rican parents with female adolescents age 13 and 14 positively contributed to their daughters' school engagement (sons were not included in this study). Also, when Latinx immigrant parents (i.e., from Mexico, El Salvador, Guatemala, Honduras, Nicaragua, Cuba, Dominican Republic, Puerto Rico, Colombia or Peru) demonstrated school involvement in their adolescents' education, adolescents expressed a sense of belonging in school (Ibañez et al., 2004). Other studies that did not include Latinx individuals also found that family support promotes school-related interests in children 11 to 13 years of age (Wentzel, 1998). Further, family support has been found to promote school identification for adolescents age 12 to 17 above peer support (Wang & Eccles, 2012). Although existing work has not focused on emerging adults and Cuban university students specifically, findings with Latinx (predominantly Mexican, Dominican, and Puerto

Rican) families and adolescents provides empirical support for a possible link between family support and belongingness in the university setting in Cuba.

Relations between Belongingness and Academic Performance

Regarding the latter part of the model, there is theoretical and empirical support for the relation between belongingness and academic performance. Glasser's (1986) control theory in the classroom is useful for understanding how belongingness would be expected to inform academic performance. Glasser (1986) argues that belongingness is one of five student basic needs that, if met, can lead to motivation and success in the classroom setting. A major premise of control theory is that all human behavior is generated internally by the behaving person, and if a student does not feel a sense of connection to school, they will pay little attention to academic subjects (Glasser, 1986).

Consistent with these notions, having a strong sense of belongingness to school has been found to be promotive of academic outcomes among diverse adolescents, including Latinx adolescents (Anderman, 2002; Gonzalez & Padilla, 1997; Ibañez et al., 2004; LeCroy & Krysik, 2008). For example, Ibañez and colleagues (2004) focused on Latinx (i.e., Mexican, Central American, Salvadoran, Guatemalan, Honduran, Nicaraguan, Cuban, Dominican, Puerto Rican) adolescents aged 14 to 19, and found that school belongingness was associated with higher achievement motivation. Further, LeCroy and Krysik (2008) focused on Hispanic (i.e., primarily Mexican decent) adolescents aged 12 to 13, and found that greater attachment to school was associated with higher grade point average (GPA).

However, there is also research that has found that sense of school belonging does not have an effect on GPA among Mexican, Puerto Rican, and Cuban high school students (Delgado et al., 2016; Sanchez et al., 2005). A possible reason for the inconclusive findings regarding

belongingness and academic performance may be that the focus of existing studies has been on a young population (i.e., adolescents age 11-17). In adolescence it is required to attend school regardless of interest, as opposed to a university setting where school is optional, possibly making college students' belongingness and doing well in school more meaningful and important because university students make the decision to continue on to higher education.

Research on relations between school belongingness and academic achievement among emerging adults in college/university settings has been more limited than work with adolescents. In a noteworthy exception, among diverse (predominantly White, but including Latinx) emerging adults in their first year of college, students' greater university belonging was associated with improved grades and academic competence (Pittman & Richmond, 2007). In another study, among college freshmen (i.e., White and African American), students' sense of belonging was associated with academic motivation (Freeman et al., 2007). Overall, no work to our knowledge has focused on Cuban medical students specifically, and the work in this developmental period overall is limited. In fact, a recent review on school belonging called for future research to be completed with college students to better understand school belonging among this population (Slaten et al., 2016). Guided by Glasser's (1986) control theory, it is expected that university students' belongingness will be associated with their academic performance in the present study.

Belongingness as a Mediator

Collectively, support provided by Latinx families (predominantly with adolescents in the U.S.) has been found to positively contribute to their children's academic achievement (Garcia-Reid, 2007; Ibañez et al., 2004; Wentzel, 1998). Additionally, having a strong sense of belongingness has been found to be promotive of academic achievement of Latinx adolescents,

with some work also supporting these relations among emerging adults (Anderman, 2002; LeCroy & Krysik, 2008; Pittman & Richmond, 2007).

Despite support for these relations with adolescents, little attention has been given to Cuban emerging adults, and no study has tested the mediational process by which family relationships may be associated with perceptions of academic performance *through* school belonging in the medical field. A related study provides support for the mediational role of school belonging in the relation between parental involvement and academic adjustment of Latinx middle and high school students with immigrant parents (i.e., from Mexico, El Salvador Guatemala, Honduras, Nicaragua, Costa Rica, Cuba, Dominican Republic, Puerto Rico, Colombia, Peru, Paraguay, and Venezuela; Kuperminc et al., 2008). Specifically, Kuperminc et al. (2008) found that parental involvement contributed indirectly to academic competence through school belonging of Latinx middle and high school students (Kuperminc et al., 2008). The current study builds on this work by testing belongingness to medical school as a mediator of family relationships and academic performance among Cuban emerging adults.

Family Legacy and Sex Differences as Moderators

Family legacy differences. In addition to exploring how belongingness mediates the association between family relationships and academic performance, it is important to explore whether this process varies by other factors, such as students' family legacy. Family legacy refers to having psychological capital as a guiding and stabilizing influence on current generations of family (Baldwin et al., 2020). Having family members in one's field is helpful for students because information is passed down from one generation to another via shared practices, beliefs, and resources, giving the student a place in physical and social spaces outside of the

family context, such as in a university (Baldwin at el., 2020). In the current study, family legacy is assessed by having family members working in the field of medicine.

Two qualitative studies with adolescents and college students indicated that family legacy is an important factor that students identify regarding their comfortability toward obtaining a university degree and their belonging to school (Langenkamp & Shifrer, 2018; Slaten et al., 2014). Specifically, adolescents (who identified as Latinx, White, African American, Asian American, Native American/Pacific Islander) expressed a predestined future, in which students who had parents who obtained a university degree assumed they would also obtain a similar degree, and thought everyone went on to higher education after high school (Langenkamp & Shifrer, 2018). This study lends support for the sense of comfortability in school that is felt by students who have family with college degrees. Further, their parents' career influenced their choice of career that they wanted to pursue. In another qualitative study, White, Black, and Asian university students who had family members who had gone to a university expressed feeling more comfortable, and as though they belonged more in the university setting (Slaten et al., 2014).

Similarly, a quantitative study with college students also demonstrated that diverse undergraduate participants (who predominantly identified as White, Black, Hispanic, Asian, or American Indian) that reported having family legacy had stronger university identification and were more likely to express familial reasons for attending college (Baldwin et al., 2020). Literature on family legacy lends support to the expectation that having family members who attended college plays an important role in students' belongingness and expectations around obtaining a degree. Although no prior studies to our knowledge tested family legacy in terms of having family members working in the medical field as a moderator among Cuban medical

students, family legacy may play a moderating role. Specifically, it is possible that the relations between family relationships and academic performance mediated by belongingness may be stronger for medical students with high family legacy (i.e., students who have family members working in the field of medicine) than students with no family legacy.

Sex Differences. No empirical work to date has tested sex differences in the proposed mediation process. However, sex differences have been observed among Latinx adolescents and emerging adults in various components of the mediation process. For example, studies have found that Latinx (i.e., Mexican, Puerto Rican, Honduran) female college students have stronger relationships with their parents than do Latinx male college students (Barajas & Pierce, 2001). Further, Latinx female college students tend to rely more on friends at school and form tighter connections with school personnel (Barajas & Pierce, 2001). Also, Latinx (i.e., primarily Mexican, Mexican American, Puerto Rican) female high school students have been found to have a higher GPA than Latinx males (López et al., 2002; Sanchez et al., 2005).

When considering sex differences in how school belonging informs academic performance, one study found no sex differences in the relationship between school belonging and academic performance among Latinx adolescents (i.e., Mexican and Dominican; Sanchez et al., 2005). Similarly, another study found that although female students reported a higher sense of belonging, school belonging was not associated with Latinx, Asian, and European high school students' GPA for either female or male students (Neel & Fuligni, 2013).

Overall, there are some sex differences in family relationships, school belongingness, and academic performance, but few studies have tested the moderating role of sex in the associations between these variables. The limited work that has been done on parts of this mediation process (e.g., relations between belongingness and academic performance) has tended not to find any

significant sex differences. However, given that this work has not tended to include Cuban individuals, and has tended to focus on adolescents, it is unclear whether different or similar findings would emerge among Cuban medical students. The current study aimed to address the gap in this area by testing whether there were sex differences in these relations. Based on empirical findings that females tend to have stronger family relationships, belongingness, and academic performance (e.g., Barajas & Pierce, 2001; Rong & Brown, 2001; Sanchez et al., 2005), it is expected that the relations between family relationships predicting belongingness and, in turn, academic performance will be stronger among female Cuban medical students than male medical students.

The Current Study and Hypotheses

We have yet to understand the role that family and belongingness play in the academic performance of Cuban medical students residing in Cuba. Grounded in theory and previous literature with Latinxs in the U.S. (predominantly Mexican, Dominican, and Puerto Rican) and variables of interest, the goal of the present study is to examine how belongingness to the school of medicine mediates the association between family relationships after starting medical school and perceptions of academic performance. Given that students have variability in their ages that may affect processes, all analyses will control for students' age. Based on theoretical and empirical work, it is hypothesized that improved family relationships will be positively associated with belongingness and, in turn, academic performance. Additionally, it is hypothesized that this mediational pathway will be stronger for students with high family legacy and for female students.

Method

Participants

The current study used data from a study called the Cuban Medical Student Motivation Project (CMSMP). CMSMP was a community partnership collaboration between a U.S. west coast university, and a Cuban research team comprised of two Cuban medical doctors/instructors, one instructor/community member, two Cuban medical students, and one Cuban community member. The goal of the study was to understand motivational processes among medical students in Cuba and identify key features of cultural mechanisms. The study consisted of 886 students who were enrolled in a Cuban medical school program at a university in Cuba during 2019. Given our focus on the experiences of Cuban individuals, the current study focused on the 637 medical students in the larger study who identified as Cuban. Students' age ranged from 17 to 32 (M = 21.36, SD = 2.04). A majority of students identified as female (54.6%).

Procedure

The larger CMSMP study was approved by the Cuban Review Board at the Cuban university. The CMSMP study used a mixed methods approach, starting with focus groups and interviews to create surveys that were distributed in schools by the Cuban research team. The data for this study came from five schools of medicine in the surrounding vicinities of Havana, Cuba. Medical students in Cuba age 18 and older were invited to participate in the study by completing a paper and pen survey. Prior to completing a survey, participants were provided an explanation of the study and students who chose to participate provided consent. Participants completed the survey in approximately 20 minutes. Participants' involvement was voluntary, but they could not receive compensation due to government policy.

Measures

Relationship with family. One item created for the purpose of the current study will be used to assess the change of perceived family support (e.g., "How has the relationship with your family changed since starting medical school?"). Participants responded based on how much their relationship changed with their family on a 3-point Likert Scale of (1) *Worsened,* (2) *Stayed the same*, or (3) *Improved*. Higher scores indicate better family relationships since starting medical school.

***Belongingness to the field of medicine*.** One item will be used to assess participants' perceptions of their belonging to the field of medicine (e.g., "I feel like I belong in the field of medicine"). Participants responded based on how much they agreed or disagreed with the statement on a 5-point Likert Scale ranging from (1) *Very much disagree* to (5) *Very much agree*. Higher scores indicate greater belongingness to the field of medicine.

Academic performance. One item will be used to assess participants' perceptions of academic performance (e.g., "How would you rate your overall academic performance from the previous school year?"). Participants responded based on whether they perceived an increase of their past academic performance on a 4-point Likert Scale ranging from (1) *Very low* to (4) *High*. Higher scores indicated greater perceived past academic performance.

***Family legacy*.** One item will be used to assess participants' reports of having family members working in the field of medicine (e.g., "How many family members work in the field of medicine?"). Participants responded based on whether they had family members working in the field of medicine on a 4-point Likert Scale ranging from 1 = "None (0)", 2 = "Few (1-2)", 3 = "Some (3-4)", or 4 = "Many (5 or more)". Higher scores indicated having more family members working in the field of medicine. Given that one of the goals in the current study is to test for differences in the hypothesized model based on family legacy, there must be enough participants

in each group to run multigroup models. There were 241 participants who responded “none”. Further, 275 students responded with “few”, 87 participants responded with “some”, and 34 students indicated that they had “many” family members working in the field of medicine. Thus, we created two groups: one group of students with no family legacy (241 students who indicated that they had no family members working in the field of medicine), and one group of students who had family legacy (n = 396), which included anyone who responded “few” “some” or “many”.

***Sex*.** Participants’ report of their sex will be used in this study. Participants reported either (0) *Female* or (1*) Male*.

Data Analytic Plan

Power analysis. To determine the ability to detect significant effects, a Monte Carlo computer simulation online application was used for determining power and sample size for mediation models (Schoemann et al., 2017). The Monte Carlo approach generates a large number of random samples from a population using existing parameter values. However, because the model proposed has not been previously tested, these parameter values are unknown. As a best approximation, power analyses were conducted using parameter values that corresponded to a medium effect size (i.e., approximately greater than or equal to .25; Cohen, 1988). The simulation analysis indicated that with one mediator and effect sizes of .25 for the paths in the model, the sample would need to include at least 155 participants to achieve power of .80 for each parameter. Given that the current study includes 637 participants, we had enough power for analyses.

Preliminary analyses. Descriptive statistics, including correlations, means, and standard deviations, were calculated for all study variables. Skewness and kurtosis were used examined to

ensure normal distribution among the variables (i.e., skewness less than two and kurtosis less than seven; Tabachnick & Fidell, 2006). No variables violated normality.

Analytic approach. Path analyses using structural equation modeling was conducted in *Mplus* version 7.2 (Muthén & Muthén, 1998–2014) using full information maximum likelihood to handle missing data (Arbuckle, 1996). Three primary fit indices were be used to examine model fit: the comparative fit index (CFI), the root-mean-square-error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR). Model fit was considered to be good (acceptable) if the CFI is greater than or equal to .95 (.90), the RMSEA is less than or equal to .05 (.08), and the SRMR is less than or equal to .05 (.08; Hu & Bentler, 1999).

Research questions. To test hypothesized associations, multigroup models were used, each with a separate moderator. In all models, family relationships was specified to predict belongingness, and belongingness was specified to predict academic performance. The direct effect from family relationships to academic performance was included. Further, age was included as a control by modeling it as a predictor of academic performance (see Figure 1 for a conceptual model).

First, a multigroup mediation model with family legacy as a grouping variable was tested. Family legacy differences were assessed by comparing two nested models, and examining the differences between them using a chi-square difference test. In this method, the first model allowed all paths estimates to be freely estimated across the group without family legacy and the group with family legacy, (i.e., an unconstrained model), and the second model was constrained for the path estimates to be equal across family legacy groups (i.e., fully constrained model). A significant chi-square difference test, suggests that there are significant differences based on family legacy; in this case, subsequent models were sequentially constrain paths, one path at a

time, and test which path differed between family legacy groups. A non-significant chi-square difference test, suggests that there were no significant differences by family legacy, and the fully constrained model would be accepted as the final model.

Second, a multigroup mediation model of family relationships predicting academic performance via belongingness was tested with sex as a grouping variable. Identical to the approach I used for testing family legacy differences, sex differences were assessed by comparing two nested models, and conducting a chi-square difference test. The first model allowed all estimates to be freely estimated across males and females, and the second model constrained the path estimates to be equal across males and females (i.e., fully constrained model). A significant chi-square difference test suggests that there are significant differences based on sex, and subsequent models will constrain paths one path at a time to test which path differs by sex. If the chi-square difference test was not significant, it suggests that there are no significant sex differences, and the fully constrained model would be accepted as the final model.

Mediation. After the final models were obtained for family legacy as the moderator and sex as the moderator, significant mediation pathways were tested to determine if mediation was significant. To formally test for mediation, the RMediation web application was utilized to compute confidence intervals for any significant mediated effects (Tofighi & MacKinnon, 2011). Using this method, mediation was significant if the confidence interval did not contain zero.

Results

Means, standard deviations, and bivariate correlations were computed for all variables among our full sample (Table 1), as well as separately for female and male students (Table 2). Findings indicated that for females and males, belongingness was positively correlated with family relationships ($r = .12$, $p = .002$). For females and males, belongingness was positively

correlated with academic performance ($r = .24$, $p < .001$). For females and males, academic performance was positively correlated with age ($r = .12$, $p = .002$).

Additionally, when considering bivariate correlations separately by females and males, findings indicated that for females, age was positively correlated with academic performance ($r = .14$, $p = .01$). For males, belongingness was positively correlated with academic performance ($r = .38$, $p < .001$). Also, for males academic performance was positively correlated with age ($r = .13$, $p = .03$).

Results for the first nested model comparison to test for family legacy group differences using chi-square difference test was not significant, indicating that the relations did not vary by students' family legacy. Given that there were no significant differences in relations by family legacy; we then moved into testing for sex differences. Results for the nested model comparisons to test for sex group differences using chi-square difference tests are presented in Table 3. Results indicated that some paths in the model varied significantly by sex and other paths in the model did not vary significantly by sex. The final partially constrained model had good fit: χ^2 ($df = 5$) = 5.04, $p = .41$; CFI = .99; RMSEA = .01 (90% C.I.: .00 - .08); SRMR = .03 (see Figure 2 for unstandardized coefficients and below for standardized coefficients). Results indicated that, as expected, improved family relationships significantly predicted more belongingness for male and female students ($\beta = .10$, $p = .03$) and, in turn, greater academic performance for male students ($\beta = .36$, $p < .001$), but not for female students ($\beta = .08$, $p = .16$).

Further, the direct effect was not significant for improved family relationships predicting academic performance. Age significantly predicted greater academic performance for both females and males ($\beta = .12$, $p = .01$).

Last, regarding mediation, there was a mediation pathway, but only for male medical students. Specifically, for male medical students, the relation between family relationships and academic performances was significantly mediated by belongingness (unstandardized 95% confidence interval for the mediated effect = .004, .069).

Discussion

Cuba has made a significant impact with its well-established healthcare system. The government in Cuba recognizes that the future of their society is intricately tied to the health and education of their youth (Steinmetz, 2005). Yet, studies assessing Cuban life are limited, particularly with respect to the lived experiences of Cuban medical students. The primary goal of the present study was to test how Cuban medical students' family relationships informed their sense of belonging to the school of medicine, and how feelings of belongingness, in turn, informed student's academic performance. Further, we aimed to examine how these relations varied by students' family legacy (i.e., students with 1 or more family member working in the field of medicine and students with no family members working in the field of medicine) and students' sex (i.e., female or male). Based on theoretical and empirical work (Garcia-Reid, 2007; Ibañez et al., 2004; Kuperminc et al., 2008), it was hypothesized that improved family relationships would be associated with greater belongingness and, in turn, greater academic performance. Additionally, it was hypothesized that this mediational pathway would be stronger for students with high family legacy (compared to students with no family legacy) and for female students (compared to male students). Overall, some findings were supported and some findings were unexpected.

Relations between Family Relationships and Belongingness

Regarding the first part of the mediation process, based on social capital theory (Bourdieu, 1986; McNeal, 1999) improved family relations was hypothesized to be associated with increased belongingness, and this relation would be strong for females than males. Somewhat consistent with expectations, we found that family relationships significantly predicted more belongingness, but the finding was significant for both female and male medical students. Existing work provides some support for these findings among Latinx youth in early to late adolescence. For example, research has found that when parents provided support to their adolescents, it was associated with more school belongingness for both male and female students (Garcia-Reid, 2007; Ibañez et al., 2004). Additionally, consistent with literature with non-Latinx youth, family support was related to school involvement and identification (Wang & Eccles, 2012; Wentzel, 1998). Collectively, this past literature points to the importance of family support specifically promoting positive feelings of belonging to school.

The current study builds on the knowledge in this area by assessing Cuban students' perceived change in the relationship with their family after starting medical school. The current study shows that in addition to having family support more generally, it is also essential to continue to have increasingly improved relations with family members after starting medical school, which promotes feelings of belonging to the school of medicine. Thus, it is important to consider not just how support is provided by family at a time, but how family relationships improve after entering medical school. There seems to be cross-context effects in which the strengths within the family context pour into students' school context for males and females. Cuban families tend to center the family, and so this finding highlights the important role that families play in students' lives.

Importantly, however, the current study was cross-sectional. It will be important for future research to assess family relationship changes across multiple time points, rather than retrospective views of change. This study provides initial support for the value in assessing changes in relationships, but the longitudinal studies are warranted to more clearly understand the relation between family relationships and belongingness over time.

The current study also extends the literature by focusing on individuals in emerging adulthood and who live in Cuba. Literature with Cubans living in Cuba is very limited as a result of Cuban policies and U.S.-Cuban relations. Emerging adulthood is a transition stage into adulthood where a person (18-25 years of age) experiences various changes, including going on to higher education (Arnett, 2000). For Latinx college students, including Cuban Americans, family is central to their social support during this developmental period, as students are often still connected emotionally and financially with their families (Freeberg & Stein, 1996; Moilanen & Raffaelli, 2010). Latinx emerging adults have been found to engage in frequent interactions with their family system and rate their parental support higher than peer support (Freeberg & Stein, 1996; Moilanen & Raffaelli, 2010). Findings highlight previous literature in the role that family plays in Cuban emerging adults' feelings of belonging to school.

Relations between Belongingness and Academic Performance

Regarding the latter part of the model, based on Glasser's (1986) control theory, an increase in belongingness was hypothesized to be associated with increased academic performance of Cuban female medical students, however, findings were partially supported. Consistent with expectations, belongingness was positively associated with academic performance, however, this finding only emerged for Cuban male medical students. Our findings for male students align with existing research. Having a strong sense of belongingness to school

has been found to be promotive of academic outcomes among diverse adolescents, including Latinx adolescents (Anderman, 2002; Gonzalez & Padilla, 1997; Ibañez et al., 2004; LeCroy & Krysik, 2008). Further, among diverse (predominantly White, but including Latinx) emerging adults in college, students' greater university belonging was associated with improved grades and academic competence (Pittman & Richmond, 2007). Findings highlight Cuban male medical education experiences align with previous literature conducted in the U.S. with Latinx adolescents' and emerging adults' sense of belongingness related to greater academic performance.

Contrary to expectations, an increase in belongingness did not predict academic performance of Cuban female medical students. Our findings run counter to some previous work assessing sex differences, which has generally found Latinx female college students have more school belongingness than Latinx male college students (Barajas & Pierce, 2001). Further, Latinx female high school students (i.e., primarily Mexican, Mexican American, Puerto Rican) have been found to have higher GPA than Latinx male high school students (López et al., 2002; Sanchez et al., 2005). Findings are also inconsistent with previous literature considering sex differences in the relation between school belonging and academic performance. For example, one study found no sex differences in this relation among Latinx adolescents (i.e., Mexican and Dominican; Sanchez et al., 2005). Similarly, another study with Latinx, Asian, and European high school students found that although female students reported a higher sense of belonging, school belonging was not associated with GPA for either female or male students (Neel & Fuligni, 2013). This prior work has focused predominantly on adolescents across diverse backgrounds, but not Cuban emerging adults specifically.

Our finding is important because it points to a possible difference in medical school connection for male and female medical students. Although sex differences in medical school experiences have received limited attention in Cuba, it is possible to draw from findings in the U.S. medical education system that has traditionally been a male dominated field in the U.S., with the majority of senior faculty and leadership roles being given to males, while females express difficulties reaching such roles (Yedidia & Bickel, 2001). This phenomenon is explained as a fundamental paradox in U.S. medical education, where women have gained parity with men in enrollment in medical school, yet women remain highly underrepresented in leadership positions in academic medicine (Ludmerer, 2020). Consequences of such a paradox include lack of mentorship by senior professors, the tendency of others to take credit for the work of women in lower positions, frequency of women having to do time consuming tasks that do not directly advance their career, and withholding opportunities from women for institutional resources and collaborations (Ludmerer, 2020).

Although not examined specifically pertaining to medical school in Cuba, a similar phenomenon seems to be present in the broader society. Cuban women have criticized the rhetoric and practice of womens' rights in Cuba, such that they speak about a gender paradox existing in Cuban society, where the nation has legally committed to equality for women but is attached to a historic structure of patriarchy (Torregrosa, 2012). Further, there is a glass ceiling for women in Cuba in obtaining leadership roles (Torregrosa, 2012). International female medical doctors have expressed constantly dealing with machismo (i.e., male superiority) in their daily lives in Cuba (Perez & da Silva).

Another possibility is that though family relationships improve after starting medical school, the institution of medical education is not receptive of female medical students who are

raised in a society of traditional gender roles and are approaching the age of childbearing (e.g., current sample age 17 to 32 (M = 21.36, SD = 2.04) Cuba childbearing average age is 26.35 (World Data Atlas, 2020), therefore female medical students are less likely to develop feelings of belonging to an institution that is not receptive to motherhood and children. Cuban female doctors who completed medical missions internationally were interviewed and stated that when going abroad their children cannot go with them and are left in the care of their mothers, sisters, or aunts and in some cases when they do not have family to care for their kids they are left with their neighbors. A depiction of the distresses faced by Cuban women in the medical field are understood by the words of a Cuban female doctor "What leads us to all these places is the economy, because you abandon your children, your husbands, men leave their wives and all of this has brought a series of difficulties for the Ministry of Public Health where the majority of marriages have separated, in other words, it destroys us socially" (Perez & da Silva, 2019). Cuba has a surplus of doctors, with 61.7% of doctors and 70.8% of health-care workers who are women (Perez & da Silva, 2019).

Future research should focus on how to better support Cuban female medical students in their medical education by creating an environment of inclusivity for female students, recognizing the extra burden that females take-on when traditional gender roles are in place, and putting in place resources such as daycares in education settings. Further, traditional gender roles should be addressed in a country that is clearly producing a large proportion of professionals that are females, by supporting the family unit as a whole in understanding the changes in gender roles, and to avoid the detriment of the family unit in the long-term when female medical doctors are having to work to support their family and representing Cuba internationally.

Drawing from these experiences and challenges faced by women, it is possible that the findings in the current study emerged because female medical students have to differentially navigate medical school in a patriarchal system that disadvantages them. Thus, although female medical students may not feel like they belong in medical school, they still work to maintain their grades so that they can continue pursing their education. Due to the patriarchal system, they have less flexibility or freedom to struggle. Therefore, regardless of whether or not females feel that they belong in medical school, they may still work to maintain their grades out of increased pressure they experience navigating the patriarchal system of medical school to be successful. Mixed-methods work is warranted that assesses female medical students' perceived pressure to maintain their academic outcomes, their feelings of belongingness, and experiences navigating machismo and patriarchy in medical systems. A mixed-methods approach would provide an opportunity to delve into these topics more closely to understand the nuances in the finding, in the current study, female medical students' sense of belonging to medical school did not inform their academic performance, although the finding was significant for male students.

Relatedly, the findings may also have emerged because we assessed *perceptions* of academic performance by asking students to rate how well they perceived that they performed in medical school. In navigating machismo in medical school and more broadly, female students may also be harder on themselves than males in rating their own performance. In other words, female students may have actually been performing well academically, but because of internalized notions, they may have felt that the success was not good enough. While perceptions of academic performance provide important information, it will be valuable for future research to also include assessments that are not reported by individuals, such as grades during the most recent semester or cumulatively.

Belongingness as a Mediator

Considering social capital theory (Bourdieu, 1986; McNeal, 1999), control theory (Glasser, 1986), and prior empirical support (Kuperminc et al., 2008), it was hypothesized that improved family relationships would be associated with increased belongingness to the field of medicine which would, in turn, increase perceptions of academic performance for Cuban medical students. Additionally, it was hypothesized that this mediational pathway would be stronger among students with greater family legacy and among female students. Hypotheses were partially supported, such that there were no differences by family legacy but were differences by sex. Specifically, it was expected that findings would be stronger for females, but actually mediation results only existed for males. This finding is important because it indicates that there is an important process that exists for Cuban male medical students, which is that having improved family relationships after starting medical school helps them feel like they belong more in medical school, which then helps them perform well academically.

As noted, Cuba is committed to gender equality, but a male dominated patriarchal structure still exists, where traditional gender roles persist (Leonard, 2021). It may be more typical for families to encourage males to go on to higher education, therefore, fulfillment of these expectations may facilitate improved family relations. The institution of medicine that is male-led may make male medical students feel more connected to medical school, which therefore leads to positive impacts on their perceptions of their academic performance. Overall, findings highlight that family plays an important role for emerging adult males that helps them feel more successful in medical school. The current study was cross-sectional, which limits the ability to make inferences about causality. The results do shed light on the importance of this topic, and suggest that it would be fruitful to focus on Cuban medical students' experiences at

multiple time points in medical school. By better understanding the nuanced reasons underlying why this mediation process exists over time, it may help ensure more success across all Cuban medical students.

Family Legacy as a Non-Significant Moderator

Although sex differences emerged in the model, no differences were found in the model based on family legacy. Based on empirical work (Baldwin et al., 2020), it was hypothesized that the relations between family relationships and academic performance mediated by belongingness may be stronger for medical students with family legacy (i.e., students who have family members working in the field of medicine) than students with no family legacy. Inconsistent with expectations no differences with family legacy were found. Our findings run counter to previous work that has found having family legacy (i.e., having family who attended university) promotes university identification for college students. Our findings also run counter to qualitative work with adolescents, which indicates having family legacy (i.e., having family members who attended higher education) cultural frame would ease the transition into college, than adolescents with a family pioneer (i.e. having no family members who attended higher education) cultural frame which would diminish the likelihood of making the transition to college or even their persistence once in college (Langenkamp & Shifrer., 2018).

It is important to note that the way in which family legacy was assessed in past studies (e.g., family member who attended university) is different from how it is assessed in the current study (e.g., students who have family members working in the field of medicine). The current study assessed whether family members were working in the field of medicine, a broad questions which could encompass family members who are working in the field of medicine but did not necessarily attend medical school, such as a receptionist working at a clinic, a caregiver, home

health-aid, medical equipment technician, medical transcriptionist, patient care technician, massage therapist (this list of occupations is not exhaustive and is based on positions traditionally available in the U.S.). Therefore, failing to accurately tap the navigational capital (i.e., skills and abilities to navigate social institutions, including educational spaces and unsupportive or hostile environments; Yosso, 2005) that family members who have gone through Cuban medical education could provide. Future research could assess family legacy as having family members who have attended medical school to better assess Cuban medical students' family legacy influence.

Limitations, Future Directions, and Conclusions

While the current study contributes to our gendered understanding of Cuban medical students' academic performance via their family relationships and feelings of belonging to medical school, there are various limitations to acknowledge. First, to reduce participant burden and due to Cuban policies in collaborating in the current study, measures were shortened to one item assessments. Although one-item assessments provide valuable information, they do limit the capacity to assess the measures of interest robustly. For example, belongingness was assessed using one item measure (i.e., I feel like I belong to the school of medicine) this measure could have been assessed more comprehensibly by assessing the two main features of belongingness which include the need for frequent personal contact with others and the perception of a stable relationship (Baumeister & Leary, 1995). Therefore, future studies should attempt to include full measures of belongingness that assess the concept more robustly.

Additionally, all of the measures in the current study were self-report assessments provided by students, which is subject to reporter bias. Future research should include additional reporters. For example, the academic performance measure assessed retrospective accounts

provided by Cuban medical students themselves, but future studies may consider assessing professors and/or mentors' reports of students' performance in medical school. Further, it is possible that family relationships may vary based on the individual that is reporting the relationship. It would be valuable to also include family members' (e.g., caregivers, siblings) reports of their relationships with students to examined differences and similarities across reporters.

Despite limitations, the current study attempts to provide insight into experiences of Cubans living in Cuba, particularly Cuban medical students whose experiences are scarce in the literature. In doing so, the present study highlights the mediation process that occurs for medical students regarding the relations between family relationships, belongingness, and academic performance. The present study provides initial support for the role family relationship change has on feelings of belongingness to medical school for both female and male students. Moreover, this study provides evidence for Cuban male medical students' feelings of belongingness to medical school informing their academic performance, but not for female medical students. This pattern suggests there is a possible difference in medical school connection for male and female medical students. Overall, mediation findings suggest that there is an important process that exists for Cuban male medical students, which is that having improved family relationships after starting medical school helps them feel like they belong more in medical school, which then helps them perform well academically, but not for female medical students. Future work should build upon this work by assessing various individuals in the family unit regarding family relationships and changes across multiple time points should be assessed, rather than retrospective views of change. It is important to understand the benefits that family relationships and belongingness has on the academic performance of Cuban medical students and how it

varies by sex to be able to understand the societal implications Cuban students encounter and how it can potentially promote or hinder academic perceptions.

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Figure 1

Conceptual model examining the mediating role of belongingness in the association between family relationship on academic performance among Cuban Medical students, with sex and family legacy included as moderators.

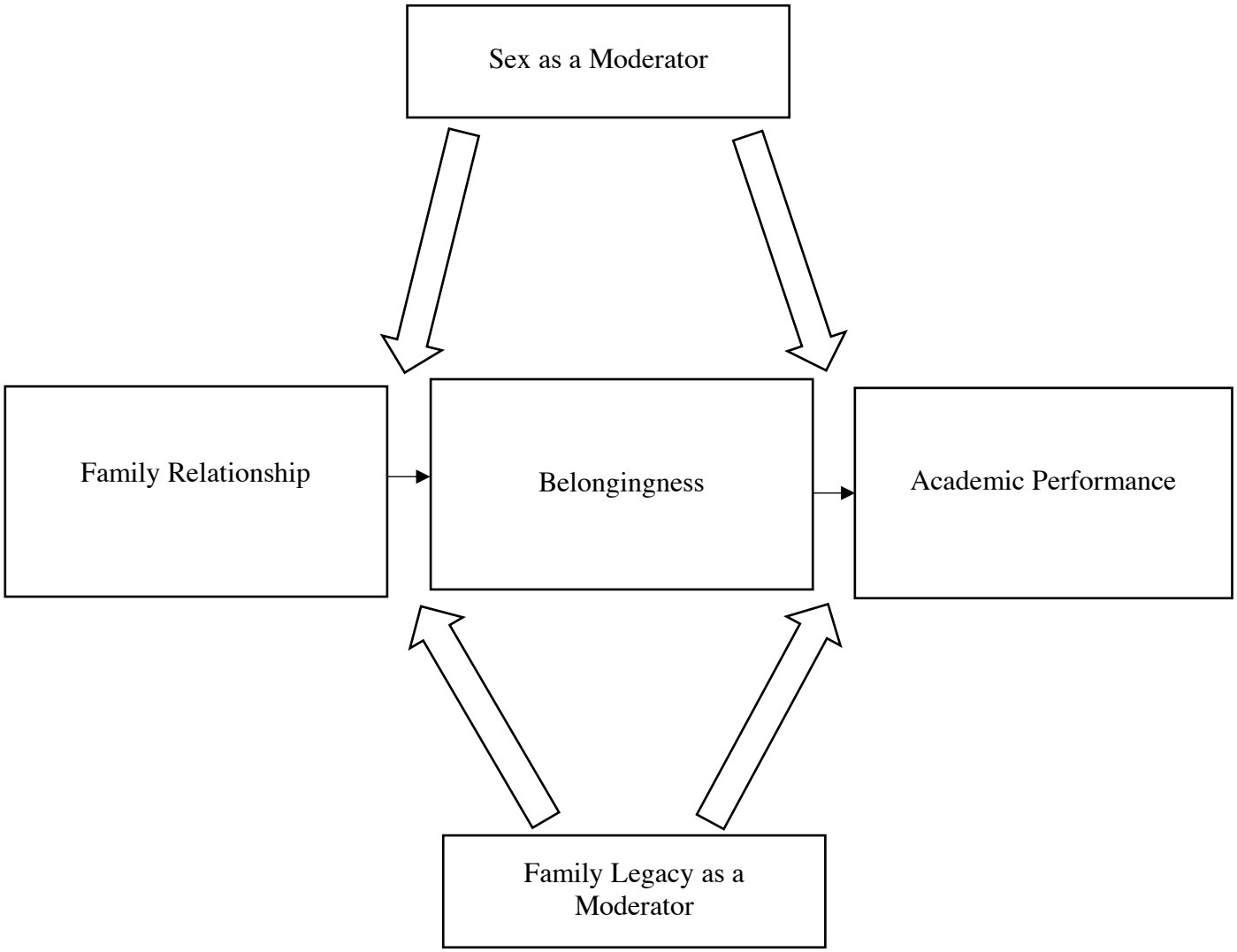
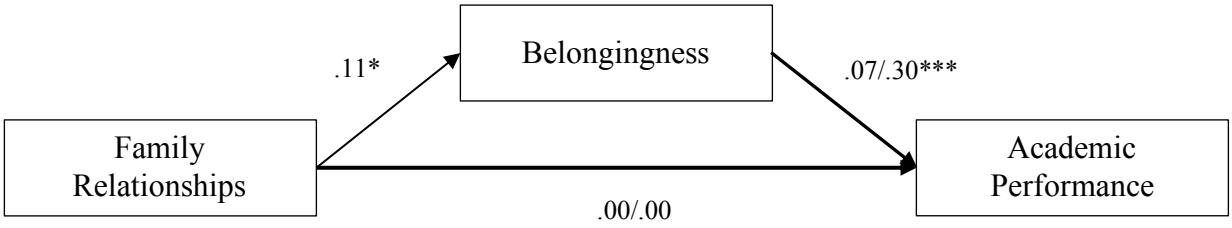


Figure 2

Final Partially Constrained Multigroup Model of Family Relationships Predicting Academic Performance via Belongingness among Female (n = 335) and Male (n = 278) Medical Students



Note. Findings are presented in the following order. Female/ Male. An unbolded line indicates that the path was constrained to be equal among all students because there was not a significant difference by sex. Coefficients are standardized. Age was included as covariate predicting academic performance, but is not displayed for ease of illustration.

* $p < .05$. ** $p < .01$, *** $p < .001$.

Table 1

Means, Standard Deviations, and Correlations among Study Variables and Controls for Cuban Medical Students (N = 637).

		1	2	3	4
1. Family Relationships		--			
2. Belongingness		.12**	--		
3. Academic Performance		.03	.24***	--	
4. Age		.02	.04	.12**	--
	Mean	2.34	4.49	3.33	21.36
	SD	0.52	0.68	0.56	2.04

Note. Sex was coded 0 = female, 1 = male.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2

Means, Standard Deviations, and Correlations among Study Variables and Controls for Female (n = 335) and Male Students (n = 278).

	1	2	3	4
1. Family Relationships	--	.08	-.02	.02
2. Belongingness	.11	--	.07	-.05
3. Academic Performance	.09	.38***	--	.14*
4. Age	.05	.11	.13*	--
<u>Female Students</u>				
Mean	2.37	4.55[a]	3.39[a]	21.27
SD	0.51	0.61	0.52	1.92
Range	1-3	1-5	1-4	17-32
<u>Male Students</u>				
Mean	2.29	4.42[a]	3.26[a]	21.52
SD	0.54	0.73	0.61	2.19
Range	1-3	1-5	1-4	17-32

Note. Correlations for female students are shown on the top right of the diagonal and correlations for male students are shown on the bottom left of the diagonal. Means and standard deviations are from SPSS and correlations are from Mplus estimates. T-tests were conducted to test for mean differences.

[a] indicates significant mean difference. Sex was coded 0 = female, 1 = male.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3

Nested Model Comparisons and Chi-Square Difference Tests for Constraints Imposed Across Females and Males

Model #	Models Compared	Constraints	CFI	RMSEA	SRMR	χ^2(*df*)	$\Delta\chi^2$ (Δ *df*)	Sig Level	Constraint Kept
0	--	Unconstrained	0.97	0.05	0.02	3.42 (2)			
1	**0 and 1**	**Fully constrained**	**0.76**	**0.08**	**0.07**	**17.05(6)**	**13.64 (4)**	**0.01**	**No**
2	0 and 2	Family Relationships → Belongingness	0.98	0.03	0.02	3.76 (3)	.35 (1)	0.56	Yes
3	**2 and 3**	**Belongingness → Academic Performance**	**0.75**	**0.09**	**0.07**	**15.45 (4)**	**11.68 (1)**	**0.00**	**No**
4	2 and 4	Age → Academic Performance	0.99	0.01	0.02	4.23 (4)	.47 (1)	0.49	Yes
5	4 and 5	Family Relationships → Academic Performance	0.99	0.01	0.03	5.04 (5)	.81 (1)	0.32	Yes

Note. Bolded font indicates a model that had significant sex differences and unbolded font indicates a model that did not have significant sex differences. CFI = Comparative Fit Index, RMSEA = Root-Mean-Square-Error of Approximation, SRMR = Standardized Root-Mean-Square Residual, Sig = Significance.