Countervailing Effects? Remittance Sending and the Physical and Mental Health of Migrants

Thesis

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Abstract

Remittances, the money that immigrants send back to recipients in their country of origin, are one of the most prominent types of transnational economic ties and provide many migrants with continued interaction with family and friends who remain in their origin countries. These transactions may prove to be beneficial or detrimental to migrant mental and physical health. Using the New Immigrant Survey (NIS), I assess whether remittance-sending has countervailing associations with migrant mental and physical health. I hypothesize that remittance-sending puts migrants at a physical health disadvantage by depleting already lower incomes. I also hypothesize that remitting migrants experience a mental health bonus through fulfillment of family roles. Overall, I find that remittances are associated with a physical health disadvantage and only provide a mental health bonus under certain circumstances. I also find that the composition of migrants who select into remitting is consequential for health outcomes. And for both physical and mental health, the type of remittance transfer (to extended or nuclear family) and the magnitude of the transfer conditions the overall health impact, particularly for mental health. My findings underscore the complexity of transnational ties, in terms of who selects into transnational economic behavior (i.e. remittance sending), the type of behavior (magnitude and

type of remittance transfer), and the health consequences, both physical and mental, of that behavior.

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Chapter 1. Introduction

In 2016, remittance flows originating in the United States (US) exceeded $138 billion (Pew Research Center 2018), making them one of the largest financial flows world-wide. For comparison, the US spent $592.2 billion in total for Medicaid in 2016 (Medicaid and CHIP Payment and Access Commission 2018). The migrants sending these remittances form a network that participates in large international capital flows. Such maintained connections across national boundaries are known as transnational ties. A type of transnational tie, economic remittances now constitute the largest source of financial flows to developing countries after Foreign Direct Investment (FDI) and in many countries remittances now exceed FDI flows (Maimbo and Ratha 2005). Thus, remittance flows play an essential role in the economies of many developing nations and contribute to Gross Domestic Product (GDP) levels globally.

Remittances are highly consequential for the families that receive them. Many migrants leave their homes due to financial hardship and travel to the U.S. in search of economic opportunities with the intention of sending remittances to their families in their country of origin (Amuedo-Dorantes, Bansak, and Pozo 2005; Becerra and Kiehne 2016). For some migrants, remittances symbolize "the realization of a family's survival strategy" for financial support (Abrego 2009:1071), as families in the country of origin come to depend on these remittances for a wide range of needs. For instance, for Mexican households that receive remittances, their average monthly value is equivalent to a minimum wage salary (Zarate-Hoyos 2004). Remittances clearly play a significant role in the lives of migrants and their families.

Remittances are not only valuable because of their transnational worth, but also because they impact patterns of stratification within countries of origin. Remittances have the potential to lift people in the country of origin out of poverty (Acosta et al. 2008). In this context, remittances may allow for long term asset accumulation by promoting the growth of other, non-remittance income (Taylor 1992). For example, a receiving family can use remittance income to purchase seeds for their farm in Mexico and then sell the crops produced by those seeds to yield higher crop incomes. As such, these monies are often used towards productive investment, rather than solely as supplemental income for consumption (Zarate-Hoyos 2004). A large number of case studies have demonstrated that, in addition to basic consumption, remittance receiving households also use these monies towards productive, educational, and health investments (Acosta et al. 2008; Dreby and Stutz 2012; Frank et al. 2009; Zarate-Hoyos 2004).

As stated, a majority of the existing literature on remittances focuses on remittance use in the country of origin. We know less about how remittances impact the migrants who send them, and even less about the impact of remittances on the sending migrant's health. My research will focus on the effects of remittances on the physical and mental health of sending migrants. First, I will test the hypothesis that remittance sending puts US-based migrants at a physical health disadvantage, potentially by narrowing the allotted budget for health expenditures in the US. Second, I will determine whether remittance sending improves mental health of senders by providing family role fulfillment and maintaining transnational ties. Jointly, I expect to find that remittance sending results in countervailing influences in the form of a physical health detriment but a mental health bonus for migrants who send them.

To address my research questions, I use data from the 2003 New Immigrant Survey (NIS), a nationally representative, cross-sectional survey of recently legalized immigrants in the United States. The NIS sample is made up of legal permanent residents (LPRs). This category includes family sponsored and employment-based immigrant visas as well as refugee and asylee visas. In addition to a variety of visa categorizations, the data contains a large enough sample to divide migrants by region of origin. Most importantly, this NIS data is particularly suited for this analysis because it is one of the only national representative surveys to include a remittance measure. Based on remittance related questions, I am additionally able to distinguish who is receiving the monies as well as the magnitude of remittances sent.

My analysis extends on prior research in several ways. First, beyond assessing the overall impact of remittance sending on health, I will also determine whether the relationship is conditioned by two additional factors. First, I will assess whether the health impacts vary by the magnitude of remittances sent. Second, I will determine if the type of receiver (i.e. immediate family or extended family/friends) matters for health. Distinguishing remittance sending by magnitude and type is key because previous findings in the small body of literature focusing particularly on remittance sending and health exhibits conflicting results, with some studies finding a mental health bonus while others find a detriment (Ambugo and Yahirun 2016; Amoyaw and Abada 2016). Multiple measures for remittance sending will allow me to distinguish important dimensions of remittance sending's impacts on health.

Whereas most prior research is focused on remittance receivers, this work fills a gap in the literature by focusing explicitly on remitting immigrants and examining the impact of remittances on their health. Further, this is the first paper to examine and compare both physical

and mental health outcomes for remitting immigrants within the same sample and to capture distinct aspects of remittance sending (i.e. magnitude and type). This analysis will use immigration and health theories to develop a deeper understanding of the mental and physical health components of remittance sending which have previously been undertheorized, and additionally focus on physical health which has been scantly addressed.

Understanding the role of remittances for health is important to redress the negative stereotypes around dependency and stunted development that frequently accompany discussion of remittance flows and the large volumes of money leaving the US (Luna 2017). These stereotypes do not account for the fact that migration as a whole, but also remittance sending in particular, have complex consequences. As these migrants strive to adapt to a new society, they also often become the sole or major supporters of the family members in the country of origin. These families often could not survive without their sacrifice, putting pressure on the migrants themselves. Disentangling these strong, complex social ties is important for changing the narrative on remittances and assessing their potential for positive impacts both at home and abroad. My research will also inform public debate by providing a better understanding of how remittances may impact the health of US-based migrants. In doing this, my research can provide a basis for effective policies aimed at helping immigrants meet their health needs.

Chapter 2. Literature Review

Transnationalism and Remittances

A large part of migration studies focuses on transnationalism—a theoretical perspective that takes into account the duality of the migrant experience (Acevedo-Garcia et al. 2012; Portes, Guarnizo, and Landolt 1999). This view of the interconnected world emerged from anthropology and sociology in reaction to world systems theory and increased globalization during the 1990s. Alejandro Portes (1999) developed transnationalism as a field of inquiry in response to the growing number, fluidity, and diversity of ties linking individuals worldwide. In order for ties between the country of origin and the receiving country to be considered transnational, scholars state that these ties must be sustained, resilient, and involve a significant proportion of migrants (Portes et al. 1999).

Scholars of transnationalism argue that political, economic, and social ties connect migrants across distances, over time, and these ties are consequential for the migrants that maintain them (Portes 2003). Migrants' daily lives may unfold largely in the US, but they often have sustained, transnational connections to their countries of origin. My research focuses on remittances, one component of economic transnational ties. As immigrants live between two worlds, they try to acclimate to their new environments while still maintaining cultural, family, and even financial ties (such as remittances) to their countries of origin.

Historically, transnationalism has occurred within the context of capitalist- or elite-driven globalization. In this form, transnationalism perpetuates exclusion, reinforcing class interests and distinctions through global capital. Large corporations use policy to directly benefit from the ties by perpetually placing migrants under subordination (Portes et al. 1999). This top down approach is "transnationalism from above" (1999:221). However, remittances are a specific example of what Portes (1997) refers to as "transnationalism from below" (1997:1). According to this perspective, individual immigrants construct transnational communities by choosing to maintain a variety of strong post-migration ties to their homeland. This autonomy allows immigrants to directly gain from networks abroad, despite living lives within an unequal US society. Essentially, transnational ties grant immigrants more independence by allowing them to participate in transnational exchange despite their remaining marginal to the American social and economic mainstream. According to Portes and his colleagues, remittances are one of the few possibilities for migrants and their families to gain a foothold in the capitalist driven system. In the existing literature, however, the impact of remittances has been largely assessed from the point of view of migrants' countries of origin. Very little empirical research has focused on the impact of remittances on the sending migrants.

Remittance Receivers

Economically, research initially linked remittances to conspicuous consumption (see Durand and Massey 1992 for a review of this literature) but recent research has moved away from that perspective and instead has argued that migrants are rational economic agents who invest in the economies of their home countries. In Mexico, for example, at the community

level, remittances have been found to be crucial to investment in local infrastructure, accounting for 84% of all funds contributed towards capital improvement projects (Reichert 1981). At the household level, remittances in Mexico are used to grow family businesses by investing in agriculture and livestock (Zarate-Hoyos 2004).

Remittances have also been shown to impact educational outcomes and aspirations in the country of origin. Across a range of settings, studies show that a large portion of remittances are spent on education (Adams and Cuecuecha 2010; Curran et al. 2003; Lu and Treiman 2007; Semyonov and Gorodzeisky 2008; Vogel and Korinek 2012). Overall, children residing in remittance receiving households in El Salvador have increased school persistence (Edwards and Ureta 2003), higher educational aspirations in Mexico (Dreby and Stutz 2012), and greater enrollment in higher education in top remittance receiving countries (Arif et al. 2019), with remittances ultimately improving educational opportunities for many children worldwide.

As SES and education are social determinants of health, remittances may also influence the health of remittance receivers. Previous literature finds that monies sent from abroad improve the health of receivers in a multitude of ways in contexts ranging from Thailand to South Africa (Abas et al. 2009; Antman 2010; Dreby and Stutz 2012; Duryea, Lopez-Cardova, and Olmedo 2005; Kanaiaupuni and Donato 1999; Sidloyi and Bomela 2016). Remittances expand family budgets to allow for health-improving purchases, such as better food or housing in Mexico (Duryea et al. 2005). Remittances also mitigate some of the poverty of elderly recipients in South Africa (Sidloyi and Bomela 2016) and lessen parental depression through financial support in Thailand (Abas et al. 2009). However, mixed results exist, as Antman (2010) finds children's

migration to be detrimental to both the mental and physical health of elderly parents in Mexico, particularly outside the context of strong, maintained transnational ties.

Remittances have been found to increase access to healthcare. Medical conditions that may have been overlooked due to limited funds can be addressed if remittances are used to subsidize costs. For instance, remittances sent to Ecuador are used for preventive health procedures, helping alleviate later health expenditures (Ponce, Olivié, and Onofa 2011). In Mexico, a small survey of Tepoztlán residents demonstrated that remittances are used to access healthcare, since many residents in the country of origin are not covered by insurance (Frank et al. 2009; Frank and Hummer 2002). These health impacts can be seen most clearly in the elderly and children as remittances improve the chance of infant survival (Hildebrandt et al. 2005; Kanaiaupuni and Donato 1999) often by increasing maternal healthcare (Lindstrom and Muñoz-Franco 2006). Nguyen and Nguyen (2015) find that remittances are positively associated with the number of healthcare visits of both children and adolescents in Vietnam. Remittances not only improve health by increasing income, but Hildebrandt et al. (2005) find that having a migrant household member increases a mother's health knowledge. Overall, there is considerable evidence that remittances provide access to health improving benefits and improve health knowledge for families left behind.

Remittance Senders

Considerably fewer studies assess the impact of remittances on senders. The studies that do exist, largely focus on sender's motivations rather than the outcomes of remittance sending for the senders. Evidence suggests that sending remittances signifies migrants' continued

membership in the community of origin (Carling 2014). In some cases, continued membership leads to transnational entereprneurishp and investment, another branch of remittance literature focused on senders (Guarnizo 2003). Other literature examines the characteristics and demographics of the senders and their financial capacities, focused on determinining what makes a migrant a remittance sender (Houle and Schellenberg 2008; Makina 2013). For instance, Makina (2013) finds that being married and male is predictive of remitting for migrants in South Africa. Houle and Shellenberg (2008) find that Canadian migrants aged 25 to 44 have the highest probabily of remitting and that men are slightly more likely to remit.

Only two studies have directly analyzed the impact of remittances on the health of senders. First, Amoyaw and Abada (2016) investigate the mental health cost and benefits for remittance senders in a Canadian sample. They find that remittance sending has a negative impact on mental health for immigrants living in Canada for less than six months. Yet remittance sending has a positive mental health impact for immigrants, especially women, who have spent more than 6 months in their new country. In a second study, Ambugo and Yahirun (2016) explore the relationship between remittances and mental health for a sample of legal permanent residents in the US. Using the NIS, they find that remitters have poorer mental health outcomes then non-remitters and this relationship holds regardless of gender, income or visa type. However, the authors do not assess different dimensions of remittance sending beyond a dichotomous yes/no indicator. Neither of these prior studies considers the role of physical health.

Remittances and Health Mechanisms

Positive Impacts

Sudden removal from networks and familiar contexts can be difficult and lead to profound feelings of loss for migrants and their loved ones (Marchetti-Mercer 2016). However, with improvements in communication technologies, such as the great expansion and affordability of internet access and transport, migrants can increasingly maintain meaningful ties to their countries of origin. Technology in particular "enables people to negotiate the physical absence of loved ones … (and) allows relationships to be maintained, despite distance" (Marchetti-Mercer 2016). One of the ways that migrants maintain transnational connections comes in the form of remittances (åKesson 2009).

Remittances are often obligations (VanWey 2004), responsibilities, and moral commitments to help family or elderly parents (åKesson 2009). Migrants who migrate for economic reasons may be especially expected to help their families. Beyond their clear financial benefit, qualitative research has revealed remittances to be a sign of fidelity and an expression of love (McKenzie and Menjívar 2011). Honduran women in McKenzie and Menjívar's (2011) sample express the wish that their husbands and sons had not migrated, despite the financial support that these men provide via remittances. However, the remittances helped alleviate some of the stress and sadness of family separation. Fear, loneliness, and stress are common emotions experienced by transnational families, whose members come to live separate, often completely changed lives in different countries. Family left behind often live in fear of marriage or family dissolution due to the physical separation of migration. In this sense, remittances can assure women that their men have not forgotten them and assure the elderly that their children still remember and care for

them (McKenzie and Menjívar 2011; åKesson 2009). These non-economic interpretations of remittances show commitment by symbolizing the emotional comfort of regular contact. Essentially, beyond their financial benefits, remittances provide emotional assurance and a sense of belonging.

Joarder et al. (2017) finds that the most important determinant of a migrant's happiness is the amount of remittances sent, as remittances symbolize fulfilling their family member role through care for those whom they have left behind. In his Bangladeshi sample, higher remittances were associated with higher life satisfaction of migrants. Research also shows that family role fulfillment is associated with an increase in mental health (Kim et al. 2011). This is especially true for men providing financial support (Simon 1995). Thus, remittances may serve to fulfill family obligations and engender positive mental health among senders.

Negative Impacts

While remittances have the ability to positively impact migrant's mental health in the ways discussed, these monies could also have negative impacts on the senders. Family responsibilities and socioeconomic status (SES) intertwine to impact migrant's health outcomes. The extended family system is one of the most important factors in the lives of immigrants (Bacallao and Smokowski 2007). Cultural and familial responsibilities can take many forms, including financial support through remittances. While the altruistic remitting role was traditionally held by fathers as heads of the household, this role has globally shifted to include mothers, directly placing the socioeconomic pressures on families as a whole. Circumstances leading to migrant's inability to fulfill remittance sending expectations, along with the deep need

and reliance of those in the country of origin on remittances may conversely provide a mental health detriment for remitters.

Further, exposure to economic hardship in the US is a well-documented aspect of migrants' economic opportunities relative to natives (Abrego 2009). Immigrant men and women are comparatively disadvantaged from the moment that they enter the US labor market. Thus, some immigrant groups are placed on the lower rungs of an already stratified system (Acevedo-Garcia et al. 2010; Portes and Rumbaut 2014), which subsequently limits their income and economic resources, particularly within the first few months of residence in the US. This is even true of immigrant groups with higher SES, who come to the US to find that their experience or education is not equivalated, often obliging them to take jobs below their qualifications (Painter and Qian 2016). Low-income households must allocate limited resources to competing bottom line necessities, which often outweigh health needs (Majerol et al. 2016). If remittance expectations become bottom line necessities, then economic pressures or hardship could lead to further psychological distress (Pearlin 1989), ultimately impacting mental and physical health.

The correlation between low SES and adverse health outcomes has been well studied (Braveman et al. 2010; Pampel, Krueger, and Denney 2010; Stringhini et al. 2011). Literature on the social determinants of health provides evidence for how health is differentially impacted by social institutions such as family, employment and school. It shows that an individual's health is not limited to biological determinants but is also strongly associated with SES, neighborhood context, and other factors (Anderson et al. 2004; Egede 2006; Hernandez, Blazer, and Institute of Medicine 2006). This health research framework attempts to disentangle the external factors that improve, maintain, or are detrimental to health. Immigrant families in particular may face several

barriers to healthcare and risks to their health that are directly associated with class standing as well as with the demanding labor of jobs associated with their class standing (Derose, Escarce, and Lurie 2007; Parra-Cardona et al. 2006).

Emotionally, migrants experience the direct impact of being separated from their families. While remittances may alleviate part of this impact by helping maintain connections and support abroad, the physical separation may still exist, with remittances serving as a reminder that one's family, friends, and past lives are forever at a distance. Support networks in the countries of origin more than often do not transfer to an immigrant's destination. Being responsible for developing new support networks in the US, while still feeling pressure to support one's older networks in the country of origin may be overwhelming for US based migrants.

Remittance sending may deplete immigrants' disposable income, particularly the already lower income of labor migrants. Actual disposable income must take into account remittances, which are sent over long periods and in varying amounts (Mohapatra, Ratha, and Silwal 2011). US-based migrants use this decreased income for a range of living and health expenses from housing to food and health care (Acevedo-Garcia et al. 2012). This is supported by Ponce et al.'s (2011) findings that while remittances do not impact overall health, they impact receivers' expenditure on preventive care and subsidize healthcare shocks in Ecuador. Remittances may operate similarly in the immigrant receiving county (in this case the US), where loss of income via remittances may not impact direct health care access but may impact preventive care. Loss of income is more detrimental, as some forms of preventive care are not covered by insurance, and those who are uninsured, partially insured, or publicly insured are less likely than those under

private insurance to utilize preventive care (Irwin et al. 2009). Remittances limit the resources that can be used towards other goals such as personal needs, living expenses, or education (Acevedo-Garcia and Almeida 2012; Mossakowski 2003). In this way, remittances may add another burden to an already economically and emotionally burdened population.

In summary, the few studies that consider the relationship between remittances and health in the sending county focus on the characteristics of remitters and reasons for their investment in the country of origin. The missing evidentiary link in all of this research is remittances' impact on the migrants that send them. Only two studies (Ambugo and Yahirun 2016; Amoyaw and Abada 2016) consider the role of remittances on migrant mental health. Building on their work, I consider both mental and physical health outcomes of remitters, allowing for countervailing associations.

I first consider how remittance sending may have adverse effects on the physical health of migrants to the US. Remittances may cause a decrease in money available for health expenditure within the US, particularly for the un-insured or under-insured. If so, remittance sending could contribute to the documented decline in health that occurs with more time in the United States, in accordance with the pattern put forth in the Healthy Immigrant Paradox. Moving to the US places some immigrants at a structural disadvantage to natives in terms of obtaining health resources, as some neighborhoods, particularly low SES neighborhoods, lack access to resources such as health clinics. Sending of remittances may exacerbate those differences. Conversely, remittance sending may have positive mental health effects for migrants, operating as a way to maintain family ties and invest in a future at home. As immigrants are placed into a highly racialized and stratified context, their abilities to look to

those at home for support and identity may lead to better mental health outcomes. Since remittances maintain transnational ties, they may operate as one mechanism of mutual support. Yet while fulfillment of family roles through financial support may produce a mental health bonus, the pressure to fulfill those roles across geographic space may lead to a mental health detriment.

Chapter 4. Data and Methods

Data

I will explore whether remitting is associated with a mental health bonus, but a physical health detriment for remitters, using data from the New Immigrant Survey (NIS), one of the few nationally representative samples of US immigrants, specifically immigrants who recently attained legal permanent residency. The sample includes newly arrived immigrants and immigrants already in the US with temporary non-immigrant visas (or undocumented immigrants) who were able to adjust their status to lawful permanent residence. The NIS is a panel survey that is drawn from a probability sample of administrative records of the United States Citizenship and Immigration Services (USCIS). The sampling frame was developed based on electronic administrative records from the US Immigration and Naturalization Service (INS). The sampling frame contains 12,500 adults and 1,250 children. Children's interviews were conducted through a parental proxy. In total 8,573 adult and 810 child interviews were completed between May and November of 2003.

The NIS contains measures for both physical and mental health as well as remittances. The NIS is ideal for the research questions assessed here because it is one of the few national surveys that collects information on remittances. Moreover, the national sample includes many different immigrant groups within the US. Use of the NIS will mean that any findings are limited to this population of new legal permanent residents; I cannot examine income and health impacts

of currently undocumented immigrants, immigrants from sending nations outside of those most represented, immigrants who are naturalized citizens, or more recent migrants including recent waves of refugees including Somalians, Syrians and Sudanese. Nor can I examine the health of immigrant's counterparts in the country of origin (Riosmena, Kuhn, and Jochem 2017) in order to better understand prior health histories. However, no other data set currently incorporates all of those groups and measures on a national level. My study aims to establish an association between remittances sent to the country of origin and health outcomes in the US. It will also assess the role of remittance size and type in hopes of spurring more work on mechanisms that lead to differential health outcomes for those who send remittances to their countries of origin versus those who do not.

Missing Data

Using the 20%/80% skip pattern that exists in the transfers questionnaire, of the total sample of 8,573, a total of 6,676 cases responded to at least one of the questions regarding remittance sending. Respondents that did not get asked were dropped. For the analytic sample for the self-rated physical health outcome, I dropped 10 cases missing information on my main dependent variable, self-rated health. I further excluded cases missing on age, race, marital status, region, and education for a total of 212 additional dropped cases from the 6,676 sample. No missing cases existed for gender or visa type. For my analytic sample for mental health, I excluded 342 cases which were missing data on the mental health question. I additionally excluded cases missing on controls for a total of 529 dropped cases. As with the self-rated health sample, no cases were missing for gender or visa type. Overall my self-rated health analytic

sample consisted of 6,464 respondents and my mental health analytic sample contained 6,147 respondents.

Measures

My dependent variables capture physical and mental health. I will use a self-rated health[1] measure to capture the physical health of migrants. This measure of health may be limited by reliability of self-assessment, but researchers find self-rated health to be a robust measure in its prediction of mortality, and overall health (Mossey and Shapiro 1982; Miilunpalo et al. 1997). Further, self-rated health is a validated measure of health statuses of different ethnic groups (Chandola and Jenkinson 2000). In this research, I use the following self-rated health question: "Would you say your health is excellent, very good, good, fair, or poor?" Using the five health outcomes, I combined excellent and very good health and all other types of health (good, fair, and poor) creating a dichotomous indicator predicting excellent/very good health versus good, fair, or poor health.

To assess the association between remittances and mental health, I will use a question from the NIS that discerns whether respondents have felt "sad, blue, or depressed" for two weeks or more in the past 12 months. Response options are "Yes," "No," or "Did not feel depressed because on anti-depressant medication (if respondents volunteered this information)." I dropped the 11 respondents who volunteered information on anti-depressants and created a dichotomous indicator of mental health predicting good mental health (not having felt sad or depressed in the past 12 months).

[1] While the NIS contains measures asking immigrants if a doctor has diagnosed them of conditions ranging from high blood sugar to diabetes, self-rated health is a more objective measure because being able to pay for a doctor to begin with is part of the focus of the study.

Remittances will be measured using the "Transfers" section of the survey. It asks respondents whether they have given (or received) financial assistance, if so, in what amounts, and specifically to what group of family members or friends. I create three different remittance variables meant to discern the different ways in which remittance sending may impact health. I first create a binary variable for sending versus not sending of remittances to examine the overall association. Second, I create a remittance variable that discerns whom these monies are sent to, distinguishing by remittances sent to one's nuclear family (children and spouses) or extended family (parents, siblings, cousins, etc. or friends) versus non remittance sending respondents. Lastly, I create a remittance magnitude variable, converting all currency data to USD using purchasing power parity* to reflect country specific currencies and values. I calculate the average amount of remittances sent among remitters in the sample ($2,583.97 per year), then classify respondents as sending either below or above average remittance amounts.

Analysis

I run ten different logistic regression models, 5 that assess the self-reported physical health outcome and 5 the mental health outcome. I first look at the association of the binary remittance sending variable with physical and mental health. Next, I take into account the role of remittance type to see if who a remitter is sending monies to matters, switching out the reference categories between non-remitters and remitters sending to extended family to assess all possible contrasts. Lastly, I look at whether remittance magnitude matters for the relationship between

* Purchasing power parity accounts for the different costs of the same items around the world, and thus will allow for economic comparisons across countries without taking into account fluctuating exchange rates.

remittance sending and health, again switching out reference groups between non-remitters and remitters sending below average amounts. In the analyses, I use education as a measure of SES because income is missing for more than half the NIS sample (see limitations section page 46). I also add sample weights and control for age, gender, marital status, race, visa type, and region of origin.

Chapter 5. Results

Descriptive Statistics

The general analytic sample (Table 1) consists of 6,464 LPRs, with slightly more males (51.81%) then females (48.19%). There is considerable region of origin diversity in the NIS sample. Almost half of the NIS migrants (47.14%) come from South/Central America and Asia, as expected of migration flows during the early 2000s. The diversity in migrant's regions of origin is also reflected in migrant's race/ethnicity, with 30.80% of the sample classifying as Hispanic, 29.33% as Asian, and 22.65% as Non-Hispanic White. Of the sample, 36.71% hold a family reunification visa, closely followed by employment visas at 19.31% and diversity visas at 18.86%. At 47.05%, almost half of the sample has an education of high school or less. With 52.95% reporting Bachelor's attainment or higher, this sample is more highly educated then the general immigrant population of the U.S.- 30% of whom reported having a Bachelor's degrees or higher (Krogstad and Radford 2018). In terms of the outcome variables, 12.47% of the sample reported negative mental health, and 34.19% reported negative physical health. In terms of the focal independent variable, 19% of the sample remits. Looking at remittance types and magnitudes, we see that 58.97% of remitters send money to extended family and friends, while a smaller 40.03% send money to nuclear families. Similarly, remitters tend to send below average amounts, as 64.43% of remitters send less then ($2583.97-the average remittance amount) and about half as much (35.57%) send more than average.

When distinguishing the sample by remittance sending (Table 1, Columns 2 and 3), we see that remitters are similar to non-remitters on some dimensions but also differ from non-remitters in important ways. Remitters and non-remitters are, on average, middle-aged but

remitters are significantly more likely to be married [though marital statuses for both groups are higher than those of the US population as a whole (Parker and Stepler 2017)]. Remitters are more likely to be male, non-White, more educated, and tend to be in the US on an employment visa. Thus, among this sample of LPRs, remitters are more advantaged in terms of education level and visa type. This matches characteristics traditionally ascribed to employment migrants, where heads of household, typically males, migrate for employment opportunities in order to send money back to their families. However, the higher education status of remitters in the sample lines up with characteristics of professional migrants. In terms of the outcome variables, there are only slight and non-significant differences between remitters and non-remitters in terms of physical health, but there are significant differences in mental health, with remitters reporting worse mental health. There are minor differences between my physical and mental health analytic samples due to a loss of 317 cases in the mental health sample caused by non-response.

Table 1. Descriptives

Table 1a: NIS Physical Health Analytic Sample Descriptives (N=6,464)*			
	Total Sample	**Non-Remitters**	**Remitters**
Variable Name	**Mean (or %)**	**Mean (or %)**	**Mean (or %)**
Gender* **			
Male	51.81	49.87	60.10
Female	48.19	50.13	39.90
Age (st. dev.)* **	54.27 (13.93)	54.33 (14.58)	53.99 (10.73)
Race/Ethnicity* **			
Non-Hispanic White	22.65	23.80	17.75
Non-Hispanic Black	13.57	13.41	14.25
Hispanic	30.80	30.29	32.98
Asian	29.33	28.78	31.68
Other (NA/Hawaii/PI)	3.65	3.72	3.34
Marital Status* **			

Not Married	36.76	38.73	28.34
Married	63.24	61.27	71.66
Region* **			
Mexico	*14.08*	14.95	10.34
South/Central America	*24.58*	23.66	28.50
Europe	*15.24*	15.99	12.05
Asia	*22.56*	22.50	22.08
India/Middle East	*12.18*	11.97	13.03
Africa	*9.72*	9.19	11.97
North America, Arctic, Oceania	*1.66*	1.74	1.30
Visa* **			
Family Reunification	*36.71*	39.71	23.94
Employment	*19.31*	17.02	29.07
Diversity	*18.86*	19.25	17.18
Refugee/Asylee	*6.44*	6.25	7.25
Other	*18.69*	17.78	22.56
Education* **			
High school or less	47.05	48.11	42.51
College (Bachelors)	31.17	30.94	32.17
Advanced Degree	21.78	20.95	25.33
Self-rated Health			
Excellent/Very Good	65.81	65.89	65.47
Good/Fair/Poor	34.19	34.11	34.53
Mental Health (Depressed 12 mo. Y/N)* **			
Yes	12.47	11.76	15.46
No	87.53	88.24	84.54
Remittance Type* **			
Nuclear Family	-	-	40.03
Extended Family/Friends	-	-	58.97
Remittance Magnitude * **			
Above Average	-	-	35.57
Below Average	-	-	64.43
Total (n)	6,464	5,236	1,228

T-test of mean difference or Pearson Chi2: p<0.1† p<0.05* p<0.01** P<0.001***

Physical Health and Remittances

The first set of tables present the results from a series of logistic regression models predicting positive self-rated physical health, with different measurement schemas for the remittance variable (Tables 2-4b). I first assess whether remittance sending itself impacts self rated health (Table 2). Next, I assess whether the relationship between remittance sending and health is conditioned by the types of remittances migrants send (Tables 3a and 3b) or the magnitude of those remittances (Tables 4a and 4b). Table 2 includes the binary remittance variable and tables 3a and 3b include the remittance type variable, switching out reference groups to better assess the relationships among remitting to nuclear family members, extended family members, or not remitting at all. Lastly, Tables 4a and 4b include a dichotomous remittance variable measuring the magnitude of remittance transfers relative to the mean remittances sent per household. The first model in all tables is the baseline model which only includes one of the three remittance variables predicting the health outcomes. The second model controls for basic demographic characteristics (gender, age, race, and marital status). The third model controls for two additional migration-related variables, region of origin and visa type. The fourth and final model in all analyses includes education as a control for SES, where respondent's education is classified as high school or less, some college, or an advanced degree(s).

Starting with the physical health models (Table 2), the results demonstrate that there is not a significant relationship between remittance sending and physical health (Model 1), even after accounting for the demographic controls (Model 2). Gender and age are highly significant predictors of physical health, with lower odds of positive health for women and older

respondents ($p<0.001$). Marital status is only a marginally positive significant predictor of physical health in this sample of immigrants, an association that loses significance in Model 2 when the demographic controls are included in the model. Model 3 accounts for region of origin and visa type. Compared to all other immigrant origin groups with the exception of Asia, migrants from Mexico have significantly worse self-rated health. The odds of having positive health are 55.8% and 40.4% higher for immigrants holding employment and diversity visas, respectively, compared to family reunification visas ($p<0.001$ and $p<0.01$). Refugees and asylees have 29.3% lower odds of having positive mental health ($p<0.01$).

After accounting for region of origin and visa type in Model 3, the negative relationship between remitting and physical health attains significance at the .01 level and persists after accounting for education level in Model 4. In the final model, the odds of reporting positive physical health are 17.3% lower for remitters ($p<0.01$) compared to non-remitters. Importantly, remitter's decreased odds of reporting positive health is only significant after accounting for the variation in who sends remittances, suggesting a suppressor effect. As evident in Table 1, among this sample of LPRs, remitters are more likely than non-remitters to gain permanent residency via employment visas and they are more likely to come from Africa and South America (Table 1), and be highly educated, all statuses that are associated with better self-rated health. Controlling for visa type, region, and education level accounts for the overrepresentation of remitters among those that report better self-rated health. Consequently, it is only after controlling for these factors that the significant and negative relationship between remitting and physical health becomes apparent.

Table 2. Odds Ratios Predicting Positive SRH by Overall Remittance Sending

Table 2: The Odds of Having Positive Health by Overall Remittance Sending (n=6,464)				
Remittance Sending	**Model 1:**	**Model 2:**	**Model 3:**	**Model 4:**
Remitting (vs. Not Remitting)	0.959	0.914	0.836**	0.827**
Female (vs . Male)	-	0.629***	0.648***	0.661***
Age²	-	0.513***	0.555***	0.571***
Race (vs. Non-Hispanic White)				
Non-Hispanic Black	-	1.029	0.871	0.905
Hispanic	-	0.561***	0.781	0.831
Asian	-	0.900	1.125	1.146
Other	-	0.543***	0.730	0.784
Married (vs. Not Married)	-	1.115†	1.043	1.017
Region (vs. Mexico)				
South/Central America	-	-	2.008***	1.879***
Europe	-	-	1.755**	1.484†
Asia	-	-	1.378	1.199
India/Middle East	-	-	1.554*	1.304
Africa	-	-	2.689***	2.335***
NAO*	-	-	6.430***	4.917***
Visa (vs. Family Reunification)				
Employment	-	-	2.032***	1.558***
Diversity	-	-	1.652***	1.404**
Refugee/Asylee	-	-	0.725**	0.707**
Other	-	-	0.955	0.965
Education (vs. High School or Less)				
College	-	-	-	1.718***
Advanced	-	-	-	2.096***
				p<0.1† p<0.05* p<0.01** P<0.001***
				* NAO= North America, Arctic, and Oceania

To test for the possibility that different types of remittance sending are more consequential for health than others, the next set of models distinguishes remittance sending by the type of remittance recipient (Tables 3a and 3b). Specifically, I distinguish between those who report sending remittances to nuclear family members versus extended family members/friends. Compared to non-remitters, those remitting to nuclear family members have marginally significant lower odds of having positive health ($p<0.1$). Those remitting to extended family have slightly higher odds of reporting positive SRH then non-remitters, but this relationship is not statistically significant. Controlling for gender, age, and race in Model 2, the marginally significant decreased odds of reporting positive physical health among those who remit to nuclear family members (compared to those who do not remit at all) loses significance, but the extended family comparison (vs. not remitting) becomes marginally significant and negative (Model 2). Controlling for the migration variables in Model 3 also increases the negative physical impact of remitting to extended family/friends on the odds of reporting positive health compared to those who do not remit. By Model 4, which additionally controls for education level, those remitting to extended family have 22.3% lower odds of having positive health than non-remitters ($p<0.01$). In contrast, there is no significant difference between those remitting to immediate family and those not remitting to anyone in the odds of reporting positive physical health.

In order to directly compare remitting to nuclear versus extended family, we turn to Table 3b. The results demonstrate that remitting to one's nuclear family is significantly associated with a 21.10% percent lower odds of reporting positive health compared to remitting to one's extended family. Thus, remitting to one's nuclear family has a negative impact on self-rated

health, but that impact is rendered insignificant once demographic controls are introduced in Model 2. Table 3b again shows that, once controls are added for demographic background factors and migration-related variables in Models 2 and 3, non-remitters have significantly higher odds of reporting positive health compared to those who remit to extended family (28.7% higher odds of having positive health then those remitting to extended family in Model 4, $p<0.001$). Comparing across tables 3a and 3b, the consistent negative health association occurs when remitters to extended family/friends are compared to non-remitters. Additionally, this set of tables again demonstrates that compositional differences between remitter and non-remitters play an important role in the association between remitter and physical health outcomes.

Table 3. Odds Ratios Predicting Positive SRH by Overall Remittance Type

3a: The Odds of Having Positive Health by Type of Remittance Receivers (n=6,464)				
Remittance Sending	**Model 1:**	**Model 2:**	**Model 3:**	**Model 4:**
Remitting (vs. Not Remitting)				
Nuclear Family	0.837†	0.987	0.896	0.896
Extended Family	1.061	0.861†	0.792**	0.777**
Female (vs . Male)	-	0.630***	0.649***	0.662***
Age²	-	0.511***	0.553***	0.568***
Race (vs. Non-Hispanic White)				
Non-Hispanic Black	-	1.028	0.872	0.906
Hispanic	-	0.560***	0.780	0.830
Asian	-	0.903	1.128	1.149
Other	-	0.542***	0.729	0.783
Married (vs. Not Married)	-	1.114†	1.041	1.015
Region (vs. Mexico)				

South/Central America	-	-	1.999***	1.870***
Europe	-	-	1.750**	1.478†
Asia	-	-	1.373	1.193
India/Middle East	-	-	1.553*	1.302
Africa	-	-	2.678***	2.323***
NAO*	-	-	6.399***	4.892***
Visa (vs. Family Reunification)				
Employment	-	-	2.042***	1.566***
Diversity	-	-	1.652***	1.403**
Refugee/Asylee	-	-	0.727**	0.709**
Other	-	-	0.954	0.964
Education (vs. High School or Less)				
College	-	-	-	1.722***
Advanced	-	-	-	2.095***
				p<0.1† p<0.05* p<0.01** P<0.001***
				* NAO= North America, Arctic, and Oceania

3b: The Odds of Having Positive Health by Type of Remittance Receivers (n=6464)

Remittance Sending	**Model 1:**	**Model 2:**	**Model 3:**	**Model 4:**
Remitting (vs. Extended Family)				
Nuclear Family	0.789*	1.146	1.131	1.153
Non-remitting	0.943	1.162†	1.262**	1.287**
Female (vs . Male)	-	0.630***	0.649***	0.662***
Age²	-	0.511***	0.553***	0.568***
Race (vs. Non-Hispanic White)				
Non-Hispanic Black	-	1.028	0.872	0.906
Hispanic	-	0.560***	0.780	0.830
Asian	-	0.903	1.128	1.149
Other	-	0.542***	0.729	0.783
Married (vs. Not Married)	-	1.114†	1.041	1.015
Region (vs. Mexico)				
South/Central America	-	-	1.999***	1.870***
Europe	-	-	1.750**	1.478†
Asia	-	-	1.373	1.193

India/Middle East	-	-	1.554*	1.302
Africa	-	-	2.678***	2.323***
NAO*	-	-	6.399***	4.892***
Visa (vs. Family Reunification)				
Employment	-	-	2.042***	1.566***
Diversity	-	-	1.652***	1.403**
Refugee/Asylee	-	-	0.727**	0.709**
Other	-	-	0.954	0.964
Education (vs. High School or Less)				
College	-	-	-	1.722***
Advanced	-	-	-	2.095***
				p<0.1† p<0.05* p<0.01** P<0.001***
				* NAO= North America, Arctic, and Oceania

The next set of models attempt to distinguish remittance sending by the magnitude of the remittances, since the amounts of money that migrants send may matter in ways that are consequential for health (Tables 4a and 4b). In terms of magnitude of remittance sending, Model 1, Table 4a demonstrates that migrants who remit above average amounts are more likely to report positive health then non-remitters, but this relationship is entirely accounted for and loses significance when controlling for the demographics in Model 2. Model 1 also demonstrates that those sending below average amounts of remittances are less likely to report positive health compared to non-remitters, a relationship that holds even when additional controls are included in Models 2-4. Adjusting for gender, age, race, region, visa type and SES, migrants remitting below average amounts are 24.4% less likely to report having positive health ($p<0.001$).

Table 4b switches the reference categories in order to directly compare the effects of remitting above average amounts compared to below average amounts. Among remitters, migrants remitting above average are significantly more likely to experience positive health then those who remit below average. In the full model (4), compared to those who remit below

average amounts, migrants who remit above average amounts are 32 percent more likely to report positive SRH. Thus, those who remit below average amounts are significantly less likely to report positive SRH compared to non-remitters or above average remitters, above and beyond demographic, migration-related, and SES controls.

Table 4. Odds Ratios Predicting Positive SRH by Remittance Magnitude

4a: The Odds of Having Positive Health by Remittance Magnitude (n=6,464)

Remittance Sending	Model 1:	Model 2:	Model 3:	Model 4:
Remitting Magnitude (vs. Non-remitting)				
Above Average	1.364**	1.152	1.043	0.998
Below Average	0.809**	0.801**	0.753***	0.756***
Female (vs . Male)	-	0.628***	0.650***	0.662***
Age²	-	0.498***	0.554***	0.570***
Race (vs. Non-Hispanic White)				
Non-Hispanic Black	-	1.052	0.866	0.901
Hispanic	-	0.584***	0.785	0.836
Asian	-	0.908	1.122	1.143
Other	-	0.560***	0.733	0.787
Married (vs. Not Married)	-	1.113†	1.044	1.018
Region (vs. Mexico)				
South/Central America	-	-	2.017***	1.887***
Europe	-	-	1.755**	1.486†
Asia	-	-	1.378	1.200
India/Middle East	-	-	1.545*	1.299
Africa	-	-	2.686***	2.336***
NAO*	-	-	6.413***	4.915***

Visa (vs. Family Reunification)				
Employment	-	-	2.004***	1.543***
Diversity	-	-	1.641***	1.397**
Refugee/Asylee	-	-	0.725**	0.707**
Other	-	-	0.955	0.965
Education (vs. High School or Less)				
College	-	-	-	1.714***
Advanced	-	-	-	2.080***
				p<0.1† p<0.05* p<0.01** P<0.001***
				* NAO= North America, Arctic, and Oceania

4b: The Odds of Having Positive Health by Remittance Magnitude (n=6,464)

Remittance Sending	Model 2:	Model 3:	Model 4:	Model 5:
Remitting Magnitude (vs. Below Average)				
Above Average	1.678***	1.457**	1.386*	1.320*
Non-remitting	1.235**	1.238**	1.328***	1.322***
Female (vs. Male)	-	0.630***	0.650***	0.662***
Age²	-	0.514***	0.554***	0.570***
Race (vs. Non-Hispanic White)				
Non-Hispanic Black	-	1.026	0.866	0.901
Hispanic	-	0.569***	0.785	0.836
Asian	-	0.896	1.122	1.143
Other	-	0.548***	0.733	0.787
Married (vs. Not Married)	-	1.113†	1.044	1.018
Region (vs. Mexico)				
South/Central America	-	-	2.017***	1.887***
Europe	-	-	1.755**	1.486†
Asia	-	-	1.378	1.200
India/Middle East	-	-	1.545*	1.299
Africa	-	-	2.686***	2.336***
NAO*	-	-	6.413***	4.915***
Visa (vs. Family Reunification)				
Employment	-	-	2.004***	1.543***
Diversity	-	-	1.641***	1.397**

Refugee/Asylee	-	-	0.725**	0.707**
Other	-	-	0.955	0.965
Education (vs. High School or Less)				
College	-	-	-	1.714***
Advanced	-	-	-	2.080***
			p<0.1† p<0.05* p<0.01** P<0.001***	
			* NAO= North America, Arctic, and Oceania	

In sum, the physical health models demonstrate the important role of selection in conditioning the impact of remittance sending on health. Selection into remitting is patterned in a way that is consequential for the relationship between remittance sending and health. Employment migrants are more likely to be remitters, and remitters tend to be more highly educated, factors that are all associated with better self-rated health. As a result, there is a suppressor effect and in the uncontrolled model, remittance sending appears to be unrelated to physical health. However, once these factors are accounted for, a negative association emerges between remittance sending and physical health such that those who send remittances are 15 percent less likely to report positive health than those migrants who do not.

The results also show that equally important to the propensity to remit is the type of remittances, as well as the magnitude of these monies. Immigrants remitting to extended family experience more of a physical health detriment than those not remitting. Compared to those who remit to nuclear family members, immigrants remitting to extended family appear to experience a physical health bonus (Model 1, Table 3b), although this association is entirely accounted for by differences in demographic profiles between the two remitting types (Model 2, Table 3b). Additionally, after controlling for all additional variables, those remitting lower amounts experience a significant physical health detriment.

Mental Health and Remittances

Similar to physical health, Tables 5-7b present the nested logistical regressions for mental health. Unlike the physical health models, the mental health models demonstrate an association between remittances and mental health even before accounting for the selection of higher SES individuals into remittance sending (Table 5, Models 1 and 2). Remitters have 28.7% lower odds of reporting positive mental health compared to non-remitters in the uncontrolled model (Table 5, Model 1 $p<0.001$). While gender and marital status play a significant role in the relationship between remittance sending and mental health, age is not significant (Model 2 , both $p<0.001$). With the addition of migration controls in Model 3, the results show that region of origin and visa type matter less for respondent's mental health then their physical health shown by the smaller, less significant ORs. Compared to Mexican respondents, respondents from Europe, Asia, and India or the Middle East have higher odds of having positive mental health. There is no significant difference in the odds of positive mental health for migrants originating in South/Central America compared to those originating in Mexico. Refugees are less likely to report positive mental health, while employment visa recipients are more likely to report positive mental health. Model 4 demonstrates that refugees have 34.6% lower odds of reporting positive mental health, compared to family reunification visa holders ($p<0.01$). Education is a stronger predictor of positive physical health outcomes then mental health. Respondents with advanced degrees have 30.8% higher odds of positive mental health then those with high school education or less ($p<0.05$) and were shown to be 2.10 times more likely to have positive physical health ($p<0.001$). Remittance sending remains highly significant throughout models with the addition of demographic, migration, and SES controls. In fact, the negative impact of remittance sending

becomes more pronounced when controlling for other explanatory variables (Model 4). In the full model (Model 4) remittance senders have 34.7% lower odds of reporting positive mental health than migrants who do not send remittances ($p<0.001$).

Table 5. Odds Ratios Predicting Positive Mental Health by Overall Remittance Sending

Table 5: The Odds of Having Positive Mental Health by Overall Remittance Sending (n=6,147)

Remittance Sending	Model 1:	Model 2:	Model 3:	Model 4:
Remitting vs. (Not Remitting)	0.713***	0.661***	0.655***	0.653***
Female (vs . Male)	-	0.652***	0.656***	0.661***
Age²	-	0.955	0.979	0.985
Race (vs. Non-Hispanic White)				
Non-Hispanic Black	-	0.931	1.856*	1.890*
Hispanic	-	0.518***	1.001	1.025
Asian	-	1.259†	1.293	1.302
Other	-	0.450***	0.762	0.786
Married (vs. Not Married)	-	1.492***	1.425***	1.415***
Region (vs. Mexico)				
South/Central America	-	-	0.923	0.907
Europe	-	-	2.168**	2.078**
Asia	-	-	1.636†	1.597†
India/Middle East	-	-	1.956*	1.883*
Africa	-	-	1.015	0.982
NAO*	-	-	1.431	1.311
Visa (vs. Family Reunification)				
Employment	-	-	1.394†	1.270
Diversity	-	-	1.052	1.001
Refugee/Asylee	-	-	0.663*	0.654**
Other	-	-	1.034	1.035
Education (vs. High School or Less)				

College	-	-	-	1.105
Advanced	-	-	-	1.308*
				p<0.1† p<0.05* p<0.01** P<0.001***
				* NAO= North America, Arctic, and Oceania

Turning to our remittance type comparisons (Table 6a), remitting to both nuclear and extended family has negative mental health impacts, but when remitting to nuclear family the negative impact is most pronounced. In the uncontrolled model, the odds of reporting positive mental health are 35.1% lower for those remitting to nuclear family ($p<0.001$) and 24.5% lower for those remitting to extended family ($p<0.01$) compared to non-remitters. Model 4 demonstrates that both types of remittances (to immediate family and to extended family/friends) are significantly and negatively associated with positive mental health compared to non-remitting, with very small differences in magnitude of the associations. For mental health, the difference between sending to nuclear family versus extended family/friends is not consequential (Table 6b, Model 4). Table 6b demonstrates that the key cleaver is whether you remit or not, not to whom you remit. There are no significant differences when one compares immediate family remitters to extended family/friend remitters.

Table 6. Odds Ratios Predicting Positive Mental Health by Overall Remittance Type

6a: The Odds of Having Positive Mental Health by Type of Remittance Receiver (n=6,147)				
Remittance Sending	**Model 1:**	**Model 2:**	**Model 3:**	**Model 4:**
Remitting (vs. Non-remitting)				
Nuclear Family	0.649***	0.624***	0.629***	0.628***
Extended Family	0.765*	0.691**	0.675***	0.674***
Female (vs. Male)	-	0.651***	0.656***	0.660***

Age²	-	0.958	0.981	0.987
Race (vs. Non-Hispanic White)				
Non-Hispanic Black	-	0.932	1.854*	1.888*
Hispanic	-	0.518***	1.001	1.025
Asian	-	1.256†	1.291	1.300
Other	-	0.451***	0.763	0.786
Married (vs. Not Married)	-	1.494***	1.427***	1.417***
Region (vs. Mexico)				
South/Central America	-	-	0.926	0.910
Europe	-	-	2.170**	2.081**
Asia	-	-	1.638†	1.600†
India/Middle East	-	-	1.954*	1.882*
Africa	-	-	1.018	0.985
NAO*	-	-	1.434	1.314
Visa (vs. Family Reunification)				
Employment	-	-	1.390†	1.266
Diversity	-	-	1.052	1.000
Refugee/Asylee	-	-	0.662**	0.653**
Other	-	-	1.035	1.036
Education (vs. High School or Less)				
College	-	-	-	1.104
Advanced	-	-	-	1.308*
				p<0.1† p<0.05* p<0.01** P<0.001***
				* NAO= North America, Arctic, and Oceania

6b: The Odds of Having Positive Mental Health by Type of Remittance Receiver (n=6,147)

Remittance Sending	**Model 1:**	**Model 2:**	**Model 3:**	**Model 4:**
Remitting (vs. Extended)				
Nuclear Family	0.849	0.902	0.932	0.933
Non-remitting	1.307*	1.446**	1.481***	1.484***
Female (vs. Male)	-	0.651***	0.656***	0.660***
Age²	-	0.958	0.982	0.987
Race (vs. Non-Hispanic White)				
Non-Hispanic Black	-	0.93	1.850*	1.884*

Hispanic	-	0.518***	1.001	1.025
Asian	-	1.254†	1.289	1.298
Other	-	0.451***	0.763	0.786
Married (vs. Not Married)	-	1.494***	1.427***	1.417***
Region (vs. Mexico)				
South/Central America	-	-	0.926	0.910
Europe	-	-	2.170**	2.081**
Asia	-	-	1.640†	1.600†
India/Middle East	-	-	1.953*	1.880*
Africa	-	-	1.020	0.987
NAO*	-	-	1.435	1.315
Visa (vs. Family Reunification)				
Employment	-	-	1.390†	1.265
Diversity	-	-	1.052	1.000
Refugee/Asylee	-	-	0.662**	0.653**
Other	-	-	1.034	1.035
Education (vs. High School or Less)				
College	-	-	-	1.105
Advanced	-	-	-	1.307*
				p<0.1† p<0.05* p<0.01** P<0.001***
				* NAO= North America, Arctic, and Oceania

In terms of the role of remittance magnitude (Table 7a), the results show that remitting below average amounts is associated with 36.3% lower odds of reporting positive mental health, compared to not remitting ($p<0.001$). Controlling for demographics in Model 2, remitting above average becomes significantly worse in terms of mental health outcomes. Controlling for SES (Model 4), remitting above average is associated with 30.8% lower odds of reporting positive mental health than not remitting, suggesting that while some migrants are able to share their recently gained access to higher incomes, remittance sending overall does not seem beneficial to one's mental health. Those remitting below average have 36.1% lower odds of reporting positive mental health then non-remitters ($P<0.001$) and remitting above average is associated

with 44.2% higher odds of reporting positive mental health, but this relationship loses significance with the first set of demographic controls (Table 7b, Model 2). It is important to note that the negative impact of remitting below average persists across models despite control variables. However, the negative impact of remitting above average only becomes apparent when controlling for background variables, suggesting a suppressor effect for these more advantaged individuals who can send above average amounts.

Table 7. Odds Ratios Predicting Positive Mental Health by Remittance Magnitude

7a: The Odds of Having Positive Mental Health by Remittance Magnitude (n=6,147)				
Remittance Sending	**Model 1:**	**Model 2:**	**Model 3:**	**Model 4:**
Remitting Magnitude (vs. Non-remitting)				
Above Average	0.918	0.732†	0.702*	0.692*
Below Average	0.637***	0.634***	0.637***	0.639***
Female (vs . Male)	-	0.654***	0.657***	0.662***
Age²	-	0.955	0.979	0.985
Race (vs. Non-Hispanic White)				
Non-Hispanic Black	-	0.930	1.852*	1.886*
Hispanic	-	0.520***	1.002	1.026
Asian	-	1.257†	1.292	1.301
Other	-	0.451***	0.763	0.786
Married (vs. Not Married)	-	1.491***	1.425***	1.415***
Region (vs. Mexico)				
South/Central America	-	-	0.924	0.908
Europe	-	-	2.167**	2.079**
Asia	-	-	1.637†	1.598†
India/Middle East	-	-	1.950*	1.879*
Africa	-	-	1.014	0.982
NAO*	-	-	1.430	1.311
Visa (vs. Family Reunification)		-		

Employment	-	-	1.385	1.264
Diversity	-	-	1.050	0.999
Refugee/Asylee	-	-	0.662**	0.653**
Other	-	-	1.034	1.034
Education (vs. High School or Less)				
College	-	-	-	1.105
Advanced	-	-	-	1.305*
				p<0.1† p<0.05* p<0.01** P<0.001***
				* NAO= North America, Arctic, and Oceania

7b: The Odds of Having Positive Mental Health by Remittance Magnitude (n=6,147)

Remittance Sending	Model 2:	Model 3:	Model 4:	Model 5:
Remitting Magnitude (vs. Below Average)				
Above Average	1.442*	1.155	1.103	1.083
Non-remitting	1.570***	1.576***	1.570***	1.564***
Female (vs. Male)	-	0.654***	0.657***	0.661***
Age²	-	0.955	0.979	0.985
Race (vs. Non-Hispanic White)				
Non-Hispanic Black	-	0.929	1.848*	1.882*
Hispanic	-	0.521***	1.003	1.026
Asian	-	1.255†	1.290	1.300
Other	-	0.452***	0.763	0.786
Married (vs. Not Married)	-	1.491***	1.425***	1.415***
Region (vs. Mexico)				
South/Central America	-	-	0.924	0.908
Europe	-	-	2.168**	2.079**
Asia	-	-	1.638†	1.599†
India/Middle East	-	-	1.949*	1.878*
Africa	-	-	1.017	0.983
NAO*	-	-	1.431	1.312
Visa (vs. Family Reunification)	-	-		
Employment	-	-	1.383†	1.263
Diversity	-	-	1.049	0.999
Refugee/Asylee	-	-	0.662**	0.653**

Other	-	-	1.033	1.034
Education (vs. High School or Less)				
College	-	-	-	1.105
Advanced	-	-	-	1.303*
				p<0.1† p<0.05* p<0.01** P<0.001***
				* NAO= North America, Arctic, and Oceania

Overall, I find scant evidence of the positive mental health impact of remittances supporting some prior studies (Ambugo and Yahirun 2016; Amoyaw and Abada 2016). Visa type and region of origin have less central roles in predicting mental health, compared to their roles in predicting physical health, and thus are less influential in conditioning the relationship between remittance sending and mental health. The models demonstrate that the magnitude of remittances is somewhat important and remitting to extended family is slightly more detrimental then remitting to nuclear family but remitting in general puts migrants at a mental health disadvantage.

Chapter 6. Conclusions and Discussions

The billions of dollars sent annually by migrants to their respective countries of origin not only play a critical role in the global economy but also in the lives of those individuals saving and sending these monies. Remittances have been shown to improve health, development, and education for transnational families worldwide (Acosta et al. 2008; Adams and Cuecuecha 2010; Arif et al. 2019; Curran et al. 2003; Dreby and Stutz 2012; Frank et al. 2009; Hildebrandt et al. 2005; Lu and Treiman 2007; Maimbo and Ratha 2005; Ponce et al. 2011; Portes 2007; Semyonov and Gorodzeisky 2008; Vogel and Korinek 2012). However, the impact of remittances on the migrants that send them has seldom been analyzed. This underappreciation for the impact of remittances on those who send them is related to our understanding of immigrant health and the immigrant health paradox. Remittances act as another layer of responsibility for many migrants in the US and this could have health implications. Thus, it is important to explore the potential health impact that remittances have on migrants, many of whom have moral, community, cultural, and family obligations to consider. I focused on the association between remittances and the mental and physical health of U.S. based migrants that send them.

My study contributes to the understanding of remittances in two primary areas. First, I simultaneously looked at the mental and physical health of remittance sending migrants, which has to my knowledge never been done. This is important as remittance sending has the potential

of impacting both types of health in different ways. Second, I compared three distinct measures of remittance sending by looking at the presence of remitting, the magnitude of remittances, and the receivers of remittance transfers. These dimensions disentangled aspects of remittance sending that were most impactful to health. Examining only at the presence of remittances masked the differential impacts that these monies have when they are sent in lower or higher volumes (Massey and Parrado 1994). A migrant who sent higher amounts of money abroad or participated in this exchange more frequently, may be more impacted by his/her remittance sending than a migrant who sent a small amount of remittances one time at the behest of family members abroad. Additionally, family systems and friendship networks could place different responsibilities and demands on remitting migrants. Fulfillment of such demands may be important in understanding remittances' relation to health. A migrant may feel more duty in sending money to spouses and children, compared to sending money to friends. Knowing who remittances are sent to and the volume in which they are sent allows researchers to understand the potentially nuanced impact of these transfers for participating migrants.

Using data from the NIS, I found that, remittances play a role in the health of migrant populations in the US but with important variation by health outcome and along the axes of remittance magnitude and type. Compared to non-remitting migrants, remitters were less likely to exhibit positive physical or mental health. Further, whom remittances were sent to and the amount of money sent matters. Remitting to any receiver is worse than not remitting when it comes to migrant's mental health. One possibility for this pattern is that remitters have closer ties to their countries of origin and may thus have been more affected by the separation than non-remitters. In fact, Thoits states that strong or primary ties, such as those to significant others, are

instrumental to understanding health outcomes (Thoits 2011). Remitters could be more likely to have a close, consistent, contact with nuclear family members and increased contact with other remittance receivers, leading to worse mental health, regardless of whom remittance receiver groups.

Amount of remittances sent was also meaningful for predicting health outcomes. Compared to remitters sending above average amounts and non-remitters, remitters who sent below average amounts experienced a physical health detriment associated with remitting. In the case of physical health, compared to non-remitters, remitters are less likely to report positive health. But compared to those remitting below average, remitters sending above average amounts are 1.32 times more likely to report positive physical health. Among remitters, remitting above average amounts produced better mental health outcomes than remitting below average (though the relationship lost significance with controls), which could potentially signify that the mental health bonus was reserved for high volume remitters. This bonus could be interpreted in regard to levels of fulfillment, as those who sent more money could view themselves as having more of a hand in helping family members abroad. However, this effect was rendered insignificant once controls were added to the model because the controls were themselves predictors of positive mental health.

Importantly, selection into remitting was not random. I found that the association between remittances and health outcomes was conditioned by selection into remitting, as migrants who were remitters tended to be more educated and more likely to come to the US on employment visas, both factors that are positively and significantly associated with better physical and mental health.

Ultimately, remitters experienced unique challenges to their health in the US, particularly as remittance sending is often a long-term commitment (Orozco and Burgess 2011), and health deteriorates with both age and with time in the US (Acevedo-Garcia et al. 2010). The relationship between remittance sending and health was complicated and multi-faceted. I find countervailing effects, as some aspects of remittance sending alleviate the mental and physical health burden and others expand remitter's financial responsibility across borders, embodying the difficulties of distance experienced by transnational families. Overall, I find remittance sending to be detrimental to migrant's mental health, echoing the work of Ambugo and Yahirun (2016) as well as that of Amoyaw and Abada (2016) when looking at recent migrants in Canada. My research is the first to find an association between remittances and migrants' physical health, with remitter's lower odds of having positive physical health. Going beyond existing studies, I find that remittance magnitude and types matter, as does selection into remitting. Seeking to understand these nuanced impacts of remittance sending on mental and physical health of migrants is crucial to improving long term migrant health and better understating the unique challenges facing some migrants in the US.

As such, remittance sending provides another layer of analysis for migrant's lives. As they move and integrate into the US, some migrants may face additional difficulties as they try to balance commitments between their new lives and family and friends back home. Remittances serve as a window into understanding these difficult but sometimes rewarding responsibilities. Yet most national surveys lack data on remittances, rendering this important aspect of some migrants' lives overlooked. As this research shows, remittance sending in as important

dimension to the lives of migrants that likely has impacts on their health and well-being and must therefore be considered in any future studies evaluating immigrant health and well-being.

Limitations and Future Research

While my findings add to the field by looking at more specific aspects of remittance sending (type and magnitude) and two health outcomes, my study has several limitations. Despite being nationally representative of LPRs, my data is limited to describing migrant populations over 15 years ago (2003) and significant populations shifts in the foreign born population by US tenure, age composition, visa makeup, and region of origin may make these findings slightly less representative of all current immigrant populations in the US (Radford and Noe-Bustamante 2019). Additionally, the NIS doesn't account for immigrants who are undocumented at the time of survey, although it does include information on those who began their lives in the U.S. undocumented and ultimately adjusted their status through a LPR visa. The burden of remitting on mental and physical health could be amplified by statuses associated with lower SES such as an undocumented status and under/unemployment. My data is also cross-sectional, rather than longitudinal and longitudinal data are needed to understand how the health impacts of remittances unfold over time. Only having a snapshot greatly limits the possibility of untangling causality- does high remitting cause worse/better health or does better/worse health cause high remitting? Future longitudinal or qualitative research should further examine the directionality between remittance sending and health.

Additionally, both mental and physical health constantly change throughout the life course, so one point in time may not accurately capture these changes. Measuring self-rated

health only captures migrant's health at one point in time and is based on the non-medical opinion of respondents. However, self-rated health better predicts mortality than physician assessments (DeSalvo and Muntner 2011) and is independently an efficient global predictor of mortality (Idler and Benyamini 1997), supporting the measure. Further, immigrant's reference group for self-rated healthy may be non-migrants in their countries of origin (Rosenzweig et al. 2004). Thus, migrants rate their mental or physical health as good, it may be because compared to those in their country of origin it is good, but this may not be the case compared to those in the U.S. There is reason to believe that stratification would be even more drastic for the undocumented since they have limited ways of improving or protecting their health. As Fox (2016) shows, undocumented immigrants are excluded from the welfare system as well as social service provisions, both of which have improved the lives of millions of low income Americans yearly since the 1970s. Lastly, since less then 20% of the sample remits, the ability to look at smaller subsets of the sample of remitters are limited by sample size. For example, thinking of women's central role in long term caregiving (Browne and Braun 2008) we have reason to believe that remittances operate differently for female remitters sending to immediate family versus male remitters sending to a few friends. A broader initial sample of remitting immigrants is necessary to conduct these types of sub-analyses.

Furthermore, it may be that second-generation migrants continue remittance patterns and past research hints that these patterns may be different. Future research should look at these generational differences since the racialized and discriminatory experiences of second-generation immigrants look significantly different from those of the first generation (Portes 2007; Viruell-Fuentes and Schulz 2009), and discrimination impacts not only mental but also physical health

(Williams, Neighbors, and Jackson 2003). Additionally, another dimension that may be relevant for the impact of remittance sending on immigrant health is migrant's location in the US, especially in relation to the rural/urban divide as Viruell-Fuentes et al. (2012) suggest that different factors impact the health of rural migrant populations.

Immigrants represent upwards of 13.6% of America's population today (Radford and Noe-Bustamante 2019), yet use healthcare services at 50 to 75 cents on the dollar compared to US born populations (Ku 2009). Lower healthcare usage combined with some migrant's transnational responsibilities are likely two overlooked factors in our understanding of the health erosion experienced by migrants with time in the US. In conclusion, the results presented here suggest that remittance sending should be considered as a mechanism that may contribute to the challenges and health of US-based immigrants.

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