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Article

Patterned remittances enhance women's health-related autonomy☆

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ABSTRACT

The consequences for women "left behind" by virtue of temporary male migration are known to be mixed. On one hand, concomitant changes in fertility, female labor force participation, and social norms are often associated with increased independence for women. On the other hand, women left behind can be vulnerable to increased dependency on members of their husbands' family, or face limited access to social institutions. These shifts in women's capacity for decision-making can have important implications for their health and well-being. Focusing on the state of Kerala in southern India, we examine the conditions under which the remittances that migrants send home have an impact on the health of women left behind. Specifically, we assess the extent to which the timing of remittance sending can support women's autonomy, and hence improve their autonomous healthcare decision-making and mobility to health facilities. We use evidence from migrant households in Kerala, a region deeply engrained in the world labor migration system for over five decades. Analysis is conducted with representative household survey data from the 2016 wave of the Kerala Migration Study (KMS), and paired with in-depth qualitative interviews with women in Kerala whose husbands and other family members have migrated to the Gulf. We show that the positive effect of remittances on women's autonomy manifests primarily through the timing of remittance receipt, not the amount of money remitted. Those who receive regular remittances experience more gains in autonomy, as compared to those receiving remittances at irregular intervals, net of amount remitted. This finding challenges the usual emphasis on remittance volume as the driving factor of social and behavioral change in sending communities. Analytical efforts should be refocused on the social-interactional component of remittance sending, and how these interactions can impact women's health and autonomy.

1. Introduction

This article considers the conditions under which temporary migration of a primarily male workforce is beneficial to women's autonomy, a crucial determinant of women's health. Temporary male migration in search of work is a characteristic feature of many low- and middle-income countries (LMIC). The consequences for women left behind are known to be mixed (Desai & Banerji, 2008; Gulati, 1983). On the one hand, male migration can indirectly lead to greater independence for women left behind through a host of economic and social changes "remitted" back to sending communities, and remitted wages can directly support higher quality of life overall (Adger, Kelly, Winkels, Huy, & Locke, 2002; Yabiku, Agadjanian, & Sevoyan, 2010). On the other, women left behind can be vulnerable to the challenges that come with an absent male household head, such as dependence on their in-laws or difficulty accessing loans (Datta & Mishra, 2011; Lenoël, 2017). Remittances can also be unreliable sources of income, leaving families in situations of financial precarity (Lu 2012; Wells, Lyn, Mclaughlin, & Mendiburo, 2014).

The changes accompanied by temporary male migration can all have implications for the health and well-being of women left behind—for instance, on their experience of stress, or their access to nutrition. In this article, we focus on the implications for women's autonomy to make decisions about and seek their own healthcare—factors known to be associated with objective health outcomes (Bloom, Wypij, & Gupta., 2001; Kawachi, Kennedy, Gupta, & Prothrow-Stith, 1999).

We link research on the impact of remittances with research on women's autonomy, assessing the conditions under which remittances improve women's healthcare decision-making autonomy. Drawing on extant definitions, we consider autonomy to comprise the extent to which women are involved in making decisions about their own health and healthcare, and the extent to which they are free to move about and enact those decisions. We focus on migrant remittance-sending, proposing that it will bolster the autonomy of women left-behind only

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under certain conditions—and that these conditions are about *when* remittances are sent, rather than how much money is remitted.

This study examines households that are part of a robust migration flow between the Indian state of Kerala and countries in the Gulf Cooperation Council (GCC). Rapid development and high demand for employment means that the GCC states receive some of the largest flows of temporary labor migration in the world. In many of these countries, the population of foreign-born workers already constitute a majority: about 88% in the UAE, 75% in Qatar, and 74% in Kuwait (Connor, 2016). The majority of these foreign-born temporary workers are men from India, Bangladesh, and Pakistan, with one or two-year visas; and the vast majority send remittances to their home communities. With its long history of Gulf migration, Kerala provides an ideal site for a study of migrant households; though given Kerala's exceptionally low fertility rate and high levels of literacy, caution should be exercised when extending these generalizations to other migrant-sending regions (Susuman, Lougue, & Battala, 2016).

1.1. Women's autonomy and women's health

Autonomy involves both actual capacities to plan and act independently, and subjective perceptions thereof. Researchers have chosen to focus on varied aspects of autonomy, but have generally agreed that it includes some "capacity to manipulate one's personal environment through control over resources and information, including freedom of movement, in order to make decisions about one's own concerns or about close family members" (Bloom et al., 2001; Mistry, Galal, & Lu, 2009). That is, decision-making capacity requires both making plans and accessing resources with which to carry out those plans. We utilize these interrelated but separable components of autonomy in this study. They are especially important when it comes to health. Seeking healthcare and planning for one's health requires an orientation toward the long-term future. It also requires that women can physically carry out their plans, which may include visits to far-off clinics, costs of medication and procedures, and significant changes in health behavior.

Important in its own right, women's autonomy is crucially linked to women's health and health-related behavior. In the US, research shows that higher levels of autonomy for women are correlated with both lower levels of maternal and child mortality and lower levels of depression (Chen, 2005; Kawachi et al., 1999). Elsewhere, greater autonomy and freedom of movement for women were also shown to be associated with higher rates of obtaining prenatal and antenatal care (Ghose et al., 2017; Mistry et al., 2009; Woldemicael & Tenkorang, 2010), as well as lower levels of unmet need for contraception and higher awareness of contraceptive options (Allendorf, 2010). Similarly, research using the Nigerian Demographic and Health Survey demonstrated a significant and positive relationship between women's household decision-making and use of modern contraceptives (OlaOlorun & Hindin, 2014). While research in LMIC has largely focused on women's reproductive health, a few studies have discussed the link between women's autonomy and health outcomes in other areas, such as cancer screening and treatment (Osamor & Grady, 2016).

The links between healthcare and autonomy can be observed across different operationalizations of autonomy, whether focused on decision-making, on freedom of movement, or on women's subjective status (Bloom et al., 2001; Kawachi et al., 1999; Mistry et al., 2009). A host of studies from several different contexts demonstrate that variation in the degree to which women have autonomy is associated with differences in health outcomes. The dynamics that impact women's autonomy will thus also have implications for women's health.

1.2. Temporary male migration and women's autonomy

Remittances from temporary workers to home communities often represent significant sources of additional income for migrant families, allowing for greater financial prosperity and increasing household purchasing power (Nziramasanga & Yoder, 2013; Zachariah & Rajan, 2015). This impacts both short-term consumption and longer-term investments: for instance, remittances can be invested into children's education, and having a migrant in the household is, in many cases, associated with increased educational attainment for migrant children (Antman, 2012; Zachariah, Mathew, & Rajan, 2001). Remittances also contribute to regional economic growth as a whole. This has the potential to reduce wealth inequalities as migration becomes more ubiquitous in the community, even though it may increase income inequality at the onset (Mckenzie & Rapoport, 2007; Odozi, Awoyemi, & Omonona, 2010; Stark, Taylor, & Yitzhaki, 1986). Temporary migration additionally serves to relieve unemployment in sending countries, thereby raising wages for those who remain behind (Taylor, 1999).

While research into women's autonomy has focused on structural effects of migration such as husband's absence or residence with in-laws, it has paid little attention to remittance sending. There is evidence of the link between male migration and increased autonomy for women left behind both as a direct result of male absence and as an indirect effect of migration's impacts on social structure and family formation. Yet research in the same vein also suggests that there are situations in which male migration can have negative implications for the autonomy of women left behind.

One pathway for male migration to change sending communities is through its impacts on fertility. Absent spouses can disrupt planned fertility, and greater wealth or encounters with new norms can change household strategies for childbearing (Bertoli & Marchetta, 2015; Billari, Philipov, & Testa, 2009). High out-migration areas in LMIC thus often see decreased birth rates over time, leading researchers to posit that temporary migration can precipitate a second demographic transition in such areas (Bertoli & Marchetta, 2015; Lindstrom & Saucedo, 2002). Male migration can also prompt changes in women's labor force participation. Women may do less unpaid household work, and work more outside of the home (Khan & Valatheeswaran, 2016), though this too is dependent on the presence of social constraints and the availability of outside employment opportunities for women (Durand & Massey, 2004). Provided that the work is done outside of the household, and comes with wage earnings, women's employment has been shown to correlate with an increase in their autonomy (Anderson and Eswaran, 2009).

Researchers also propose that gains to women's autonomy reflect the "social remittances" migrants bring from receiving countries in the form of changed behavior and preferences (Levitt, 2001). For instance, receiving country fertility norms might influence migrants' childbearing preferences, or change their attitude towards contraception, with effects on women's independence from family life (Liew, 2007). Gains in women's autonomy may also reflect shifting household structure: if, for instance, the absence of men requires women in migrant households to take on greater roles in decision-making in areas such as household purchases and investments, healthcare, and children's education (Zachariah et al., 2001). In the same vein, women may have increased mobility outside of the house by way of necessity. This dynamic may account for research that finds a direct effect of male migration on improving women's autonomy outside of its impacts on fertility and women's employment (Yabiku et al., 2010).

Yet temporary male migration can also have negative impacts on women's autonomy. In areas where women are expected to be accompanied by male companions in public, absent husbands and sons mean greater restrictions on where women can go. Research in Kerala and in rural Pakistan show that when migrant remittances lead to greater household wealth, reduced need for women's participation in paid labor may decrease opportunities for women to have independent income (Khan & Valatheeswaran, 2016; Wassan, Hussain, & Amin, 2017). There, and in Bangladesh, the enhanced status of male migrants has also allowed men to exercise greater power of choice in both marriage and divorce, with negative effects on women (Rahman, 2009; Wassan

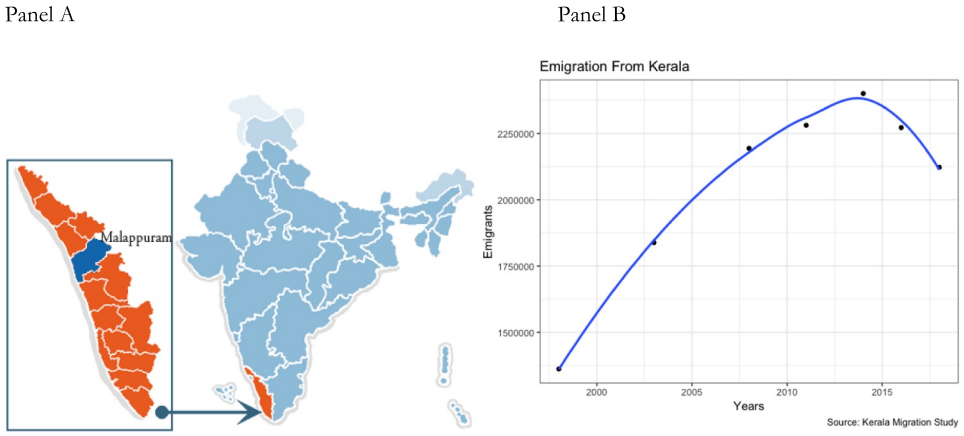

Fig. 1. Kerala as a study site for migrant sending communities. Panel A: Map of Kerala. Panel B: Historical Out-Migration Rates from Kerala. Estimates from the 1998, 2003, 2008, 2011, 2013, and 2016 Kerala Migration Study Surveys. Image adapted from the Center of Development Studies, Kerala.

et al., 2017). The effects of male migration on the marriage market can extend beyond migrant spouses: in the Matlab region of Bangladesh, researchers find that a brothers' migration often led parents to exercise more control over a sister's marriage, prioritizing proximity in order to ensure care for themselves in their old age (Protik & Kuhn 2006). Additionally, when marriage is patrilocal, women with absent husbands may be forced to cede to their in-laws control over crucial decisions with respect to health and healthcare.

Temporary migration aids family survival through remittances only when remittances are sufficient. Initially, migration can also entail amassing significant debt to pay migration recruitment fees, as well as periods of uncertainty when wages are not regular, or not as high as expected. These situations can leave families in financial precarity. Meanwhile, women in migrant households are often left to manage relationships with creditors involved in sending the migrant abroad, in addition to other demands on household finances (Rahman & Fee, 2009). Families of temporary migrants may be uncertain about how much migrants earn, and how much and when remittances will be sent (Seshan & Zubrickas, 2015). When remittances falter, families are left without outside resources, and without the capacity to plan for the future. They may have to rely more heavily on in-laws, extended family, or other community members (Wells et al., 2014).

In sum, studies on sending communities focus on the financial impact of remittances. They fall short of identifying the ways in which remittances have social impacts, though one study indicates minor protective effects of long-term remittance receiving on the psychological health of left-behind family members (Lu, 2012). Meanwhile, studies of women's autonomy tend to focus on other structural or social factors. Yet remittance sending is itself a social process, inscribing relationships between remitters and recipients and positioning both within a broader network of relationships (Carling, 2014).

Remittances also have a temporal component: they are sent at certain times and with certain frequencies. Variations in the amount remitted matter for a household's overall capacity for consumption, but variations in the *timing* of remittance crucially affect how well a household is able to plan for future consumption. Decisions about health and healthcare involve long-term planning, and are correspondingly more effective when one has stable expectations for the future. Thus, remittance timing, with respect to both pattern and frequency, may be especially salient for healthcare decision-making autonomy. Here, we bridge disparate literatures by focusing on how and under what conditions monetary remittances impact the health of women left behind through its impact on their autonomy. We posit that monetary remittances can have an impact on the autonomy of women "left behind" and thus on their health such that women in households receiving more frequent and regular remittances will report higher levels of autonomy than those in households receiving remittances at irregular intervals.

1.3. Migration from Kerala

This analysis uses data from Kerala, India. India is one of the world's top remittance-receiving countries and Kerala is one of the largest emigrant-sending states in the country. In 2011, Kerala sent over two million workers abroad and received 31% of its net state domestic product from remittances. Migration has been a central driver of economic growth in Kerala since the mid-1900s, contributing to significant declines in poverty and unemployment across the state. Temporary migration has been increasing from Kerala to the GCC since the Kerala Migration Survey (KMS) began in 1998. Data collected during the first wave revealed that 1,400,000 individuals had emigrated and sent 130 billion rupees prior to 1998; the 2014 wave of the study estimated that 2,400,000 individuals had emigrated and sent 710 billion rupees back to Kerala between 1998 and 2014 (Zachariah & Rajan, 2015). Kerala is located geographically in Panel A, where Malappuram - the site for our qualitative interviews- is located; the historical pattern of out-migration from Kerala is reported in Panel B of Fig. 1.

As the largest sending district in Kerala, Malappuram offers an ideal site for understanding the impact of global migration from a sending country's perspective. The district's substantial migrant population has been instrumental in shaping Kerala's labor market and economic growth – it accounted for about 18.8% of all emigrants from and 20% of all remittances to Kerala in 2014 (Rajan, 2014). In practical terms, Malappuram is ideal because of the saturation of transnational households (Zachariah & Rajan, 2015). Many of the developmental gains in women's health and autonomy likely result from social changes already in place following past migration cycles. At 1.58, Kerala's total fertility rate is well below replacement level; female literacy is 92% (compared to a national average of 65%); contraceptive awareness is high; and infant mortality rates are the lowest in the country (Alukal, George, & Raveendran, 2018; Susuman et al., 2016). In these areas, any diffusion of normative change as a result of migration has already occurred, thus we can rule out normative variation as a factor impacting variations in women's autonomy today. The history and ubiquity of male migration and its impacts also makes Kerala a conservative study site, as differences in women's autonomy are far less likely to be due to variations in exposure to international migration, allowing us to identify more immediate determinants thereof. We focus here on women's reported participation in decision-making and their freedom of movement, particularly as they relate to healthcare. In addition to having implications for women's objective health and well-being, these measures offer insight into women's subjective sense of their own autonomy and how it has changed.

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2. Methods

2.1. Study design

This study employs both semi-structured interviews and survey data to understand how the social process of receiving remittances is a determinant of women's health-related autonomy in Kerala. Ethnographic research and semi-structured interviews conducted in Malappuram, Kerala between 2016 and 2017 serve as the qualitative foundation of our analysis. Our fieldwork included interviews with 40 women from diverse caste and religious backgrounds sampled from each of the six sub-districts within Malappuram with an eye toward population size and religious composition. We interviewed women about a wide range of topics, including their family lives, social and political participation, and hopes for the future, seeking to examine how male migration to the Gulf shapes the lived experience of women who do not migrate themselves but are still significantly impacted by the process. Interviews were recorded, transcribed, and coded after anonymization, and are stored in a secure location. We pair these narratives with statistical analysis using data from the 2016 wave of Kerala Migration Study (KMS), a representative longitudinal household survey conducted in Kerala. The survey has been described in detail elsewhere (see Kunniparampil Curien Zachariah & Rajan, 2015). The 2016 KMS dataset includes a gender module which focuses on the women left behind after family members migrate for economic opportunities. The 2016 dataset includes information on 55,276 individuals in 13,199 households. This includes 2,834 married women aged 15–49 who were individually interviewed for the gender module. We exclude participants who are missing data for the outcome (change in mobility to healthcare centers, n = 93) or for any covariates (husband's residence, n = 26; women's employment status, n = 12; whether or not they are receiving remittances directly, n = 66). Most women who are excluded had missing data for multiple variables. In total, we removed 85 participants, and our final sample size is 2,749. From this, we use a sample of 689 women who reported receiving remittances directly.

2.2. Measures of autonomy

Using KMS data, we measure two dimensions of autonomy: change in healthcare decision-making participation and change in freedom of movement to seek healthcare, as reported by the married women respondents. Respondents were asked, "Has your participation in this decision [related to your own healthcare] increased, decreased or not changed in the last 5 years?" Respondents were also asked "Do you think your freedom of movement in this respect [to visit a health clinic/hospital] has changed in the last five years?" Again, response options were: increased, decreased, and unchanged. We compare those who reported increased autonomy against those with decreased or unchanged autonomy.

In addition to *change* in healthcare autonomy, current healthcare autonomy levels were measured by assessing self-reported participation in decision-making and freedom of movement related to their own healthcare. Women were asked, "Who makes this decision [related to your healthcare]?" Women were grouped as: makes decisions alone, makes decisions with others (if she reported making decisions with her husband or family elders, or that everyone in the household makes the decision), or not participating in decisions at all (if she reported that her husband alone or family elders alone make decisions). They were also asked about their current freedom of mobility: "Can you go by yourself [to a health clinic/hospital]?" Response options included: yes; no, you need an escort; no, you are not allowed to go; and other.

While the degree to which women report involvement in their decision-making and freedom of movement represent tangible dimensions of autonomy, the questions about whether women feel these dimensions have changed or not reflect women's perceptions about their own autonomy. Jointly, these measures capture a fuller picture of lived experience for women in migrant households.

2.3. Remittances

To examine the effects of remittances from migrants outside of Kerala to women left behind in Kerala, we use data from the migration module of the KMS household survey. In a remittance schedule, respondents were asked whether or not they received any remittances in the form of money, goods or gifts from persons residing abroad or within India in the past 12 months. If they responded yes, they were asked to list the individuals who sent and received each remittance, the frequency with which the remittance was received, and the amount received. They were offered six options to describe the remittance frequency: every month, every three months, every six months, every twelve months, no fixed pattern, and other.

Households can list multiple remittances in the remittance schedule; this analysis focuses on the family's *primary* remittance: the remittance that they list first. Thus those who list a remittance received every month in the first line could receive remittances more frequently overall, if there are multiple remitters. However, there were few cases in which households listed more than one remittance sender.

We first assess the effect of a migrant household receiving any remittance at all using a dichotomous variable allowing comparison between those in households receiving any amount of remittance with those in households receiving nothing.

To examine the effects of remittance timing, we conduct two analyses: the first concerns pattern, comparing those who receive at least one patterned remittance (reflecting some sort of regularity) with those who receive remittances on no discernable pattern; the second concerns frequency, comparing those who receive remittances at different frequencies: every month, every three months, and every six months to a year.

To assess the impact of remittance *regularity*, we group all individuals who reported receiving their primary remittance on any fixed pattern – either every month, every three months, every six months, or every year – as receiving patterned remittances, and compare them to those who reported no fixed pattern in receiving their remittances. To compare the impacts of differences in remittance *frequency*, we include variables specifying how often they receive remittances. Since the number of women who reported remittances every six months and every year were relatively small, we group those who received their primary remittance either every six months or every year into one category ("rare" remittances), comparing them to those who receive remittances every month and those who do so every three months.

We control for household income, total amount of remittances received, respondent's age, respondent's employment status, husband's residence, and in-law residence, all factors known to be related to women's autonomy. Self-reported household income and amount of remittances are collected in rupees, and divided by 1,000 for interpretability. We calculate annual household income by multiplying amount of income received in the month prior to the interview by 12. This figure includes salaries, pensions, rental income, and business income, and does *not* include remittances and other money received from outside Kerala. We utilize the KMS staff's total remittances calculation, which was computed by summing the amount of remittances in households received from various individuals in the 12 months preceding the interview. We categorize respondent's employment status into four classes – not working, participating in unpaid labor, looking for work, and employed. Husband's residence is measured by responses to the question, "Does your husband currently reside in the household?" Lastly, we use household rosters with information on a respondent's relationship to household head to construct a dichotomous variable for whether or not the respondent resides with her in-laws. We categorize women as residing with their in-laws if the roster indicates that they are a daughter-in-law or sister-in-law in their household, or if they are

Table 1
Sample characteristics by changes in healthcare decision-making participation and changes in freedom of movement to healthcare facilities.

	Change in healthcare decision-making participation			Change in freedom of movement to healthcare centers		
	Decreased or unchanged	Increased	P-value	Decreased or unchanged	Increased	P-value
n	1970	779		1938	811	
Measures of autonomy in 2016						
Participation in healthcare decision-making (%)			< 0.001			< 0.001
Doesn't participate at all	25 (1.3)	15 (1.9)		33 (1.7)	7 (0.9)	
Makes decisions with others	1350 (68.5)	384 (49.3)		1279 (66.0)	455 (56.1)	
Makes decisions alone	595 (30.2)	380 (48.8)		626 (32.3)	349 (43.0)	
Freedom of movement to healthcare facilities (%)			< 0.001			< 0.001
Not allowed to go at all	11 (0.6)	4 (0.5)		12 (0.6)	3 (0.4)	
Can only go with an escort	618 (31.4)	146 (18.7)		641 (33.1)	123 (15.2)	
Allowed to go alone	1341 (68.1)	629 (80.7)		1285 (66.3)	685 (84.5)	
Covariates						
Household income Mean (sd)	102.07 (143.83)	155.24 (211.23)	< 0.001	103.40 (152.45)	149.97 (194.90)	< 0.001
Household remittances Mean (sd)	163.91 (247.34)	172.99 (271.09)	0.662	164.45 (238.71)	172.15 (289.26)	0.714
Age Mean (sd)	35.60 (7.62)	36.59 (8.44)	0.003	35.47 (7.72)	36.86 (8.16)	< 0.001
Women's employment status (%)			< 0.001			< 0.001
Not working	3 (0.2)	4 (0.5)		3 (0.2)	4 (0.5)	
Participating in unpaid labor	1600 (81.2)	567 (72.8)		1569 (81.0)	598 (73.7)	
Looking for work	75 (3.8)	49 (6.3)		72 (3.7)	52 (6.4)	
Employed	292 (14.8)	159 (20.4)		294 (15.2)	157 (19.4)	
Husband's residence (%)			0.001			0.059
Resides outside of the household	410 (20.8)	209 (26.8)		417 (21.5)	202 (24.9)	
Resides in household	1560 (79.2)	570 (73.2)		1521 (78.5)	609 (75.1)	
In-law's residence (%)			0.055			0.215
Does not live with in-laws	822 (41.7)	357 (45.8)		816 (42.1)	363 (44.8)	
Lives with in-laws	1148 (58.3)	422 (54.2)		1122 (57.9)	448 (55.2)	

listed as wives in a household that also contains a parent. Table 1 in Results shows descriptive statistics for these covariates.

2.4. Statistical analysis

We fit multivariate logistic regression models to analyze the relationships between remittance regularity and frequency and women's healthcare decision-making, as well as to analyze the relationships between remittance regularity and frequency and women's healthcare-related freedom of movement. For the regression analyses, we use dichotomous variables to represent women's healthcare-related autonomy: increased and decreased/unchanged decision-making participation, and increased and decreased/unchanged freedom of movement. We test the same model with alternative specifications – with different frequencies of remittances – to determine the interval that has the greatest impact on women's autonomy.

We fit additional multivariate logistic regression models to explore the effects of receiving remittances directly rather than through another household member. There are two possible ways to identify these women: the first is that respondents in the gender module who indicated they are receiving remittances are asked "Is the money being sent to you directly?"; the second is to match a respondents' identification number to the identification numbers listed in the remittance schedule under the recipient column. In the first set of models, we add a dichotomous indicator of their answer to whether money was sent to them directly as an additional control. In the second set, we restrict the sample to women who responded "yes" to that question. In the third, we restrict the sample to women whose participant identification number from the gender module matched a participant identification number that was reported as a remittance recipient in the remittance schedule. Like the regression models described above, the first model in each of these two sets estimates the association between remittance frequency and regularity on decision-making participation, and the second model in each set estimates the association between remittance frequency and regularity on freedom of movement to health centers. We again control for household income, total amount of remittances received, respondent's age, respondent's employment status, husband's residence, and in-law residence. Finally, our last set of regression models estimates the association between remittance timing on health-related decision-making and movement, but instead of using the dataset that is cleaned of missing values, these models use the full sample of women who completed the KMS gender module (n = 2834).

3. Results

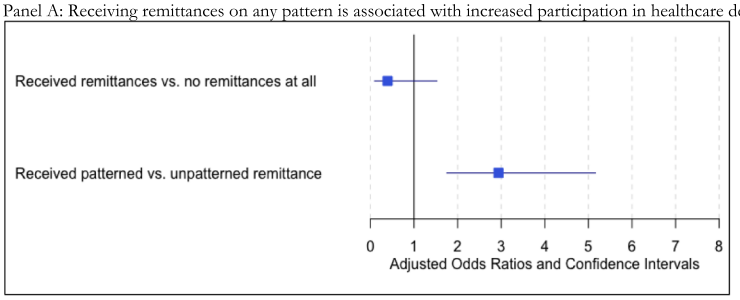
3.1. Findings from the KMS Survey

Healthcare autonomy levels (as recorded in 2016) are displayed in Table 1. Over 60% of women reported jointly making decisions about their own healthcare with others in the family, more than one-third reported making such decisions on their own, and less than two percent of women reported that they did not participate at all in making decisions regarding their own healthcare. While 70% of women reported being able to go to a clinic alone, many reported restrictions on their freedom of movement: 28% of respondents needed an escort to visit a health clinic or hospital. Table 1 also displays data on the changes in healthcare autonomy between 2011 and 2016. When it came to decision-making, 28.3% reported increased participation and 71.7% reported decreased or unchanged participation. Likewise, 29.5% of women reported increased freedom of movement and over 70% reported decreased or unchanged freedom of movement.

Figs. 2 and 3 display the relative odds of increased participation in healthcare decision-making and increased freedom of movement as estimated by each regression model. Tables 2 and 3 present these regression models in greater detail. Our findings show that women who received patterned remittances were more likely to report increased autonomy compared to women who received remittances at irregular intervals, net of the amount received. Our findings also show that the highest odds of increased autonomy are among women who received monthly remittances, compared to women who received remittances at other frequencies. By contrast, merely receiving remittances is not significantly associated with increased autonomy.

After adjusting for household income, remittance amount, woman's age, woman's employment status, whether or not the respondent's

Panel A: Receiving remittances on any pattern is associated with increased participation in healthcare decision making.



Panel B: Those who receive remittances every month rather than every three, six, or twelve months are more likely to report increased participation in healthcare decision making.

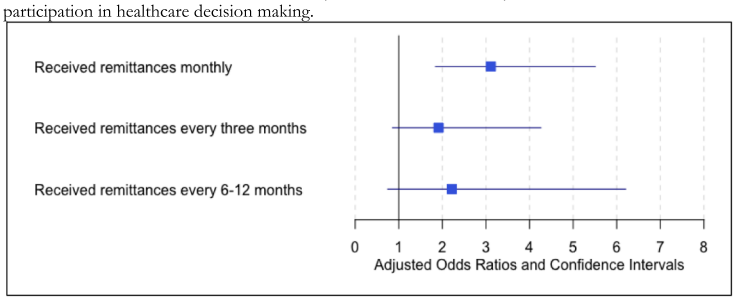


Fig. 2. Relative odds of increased participation in healthcare decision-making. Panel A: Receiving remittances on any pattern is associated with increased participation in healthcare decision making. Panel B: Those who receive remittances every month rather than every three, six, or twelve months are more likely to report increased participation in healthcare decision making.

husband resides in the household, and whether or not the respondent lives with her in-laws, our findings show that the odds of increased decision-making participation among women who received at least one remittance compared to women who did not receive any remittances are not statistically significant, with an odds ratio of 0.39 and a 95% confidence interval (CI) of 0.10 to 1.52. Conversely, the associations between participation in decision-making and timing of remittances (receipt of patterned remittances and receipt of monthly remittances) are highly statistically significant. The odds of increased decision-making among women who received at least one patterned remittance are 2.94 (95% CI: 1.75, 5.16) times that of women who received remittances on no fixed pattern. The relative odds of increased participation are slightly higher among women who received remittances every month (OR: 3.11; 95% CI: 1.84, 5.51) compared to women who did not receive a primary remittance on a fixed pattern.

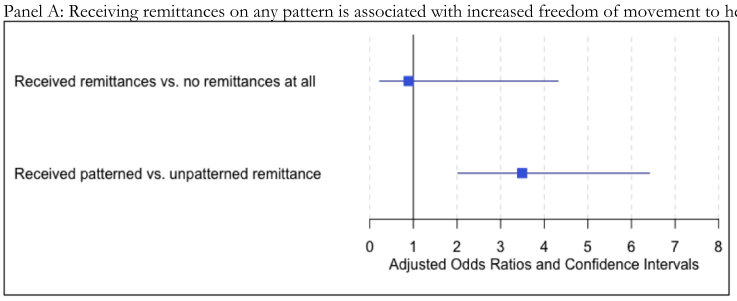
The adjusted odds ratio of increased decision-making participation among women who received at least one remittance every month compared to women who received remittances on irregular intervals is 3.11 (95% CI: 1.84, 5.51); the adjusted odds ratio among women who received at least one remittance every three months is 1.91 (95% CI: 0.86, 4.26); and the adjusted odds ratio among women who received at least one rare remittance on a fixed pattern is 2.22 (95% CI: 0.75, 6.21).

Fig. 3 displays the relative odds of increased freedom of movement to healthcare centers. Similar to the relationship between remittance timing and decision-making, we find that women who reported patterned remittances also reported increased freedom of movement to healthcare facilities. The strength of this association – between remittance timing and autonomy – increases as remittance payments are distributed more frequently. More specifically, we find that the more frequent the pattern of remittances, the higher the odds of increased mobility to healthcare facilities.

Notably, we also find that the relationship between remittance timing and self-reported freedom of movement is stronger than the relationship between remittance timing and participation in decision-making.

After controlling for potential confounders, the association between

Panel A: Receiving remittances on any pattern is associated with increased freedom of movement to healthcare centers.



Panel B: Those who receive remittances every month rather than every three, six, or twelve months are more likely to report increased freedom of movement to healthcare centers.

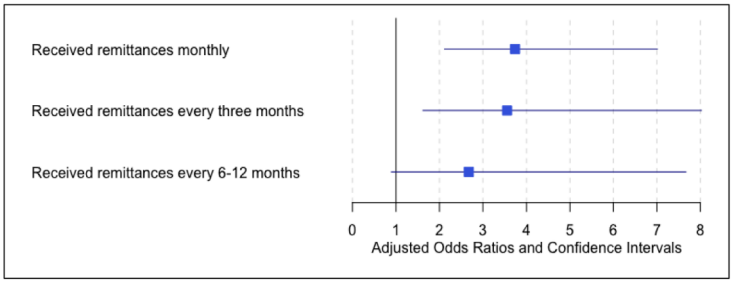


Fig. 3. Relative odds of increased freedom of movement to healthcare centers. Panel A: Receiving remittances on any pattern is associated with increased freedom of movement to healthcare centers. Panel B: Those who receive remittances every month rather than every three, six, or twelve months are more likely to report increased freedom of movement to healthcare centers.

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Table 2
Logistic regression models estimating associations between remittance frequency and increased healthcare decision-making participation: Kerala Migration Survey, 2016. Odds Ratios (95% CI).

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Received remittances vs. no remittances at all	0.393 (0.095, 1.524)						
Received patterned vs. random remittance		2.938*** (1.754, 5.162)					
Received remittances monthly			3.112*** (1.842, 5.509)				
Received remittances every three months				1.912 (0.856, 4.260)			
Received remittances every 6–12 months					2.217 (0.747, 6.205)		
Total household income earned in the past 12 months (1000 s of rupees)	1.001**	1.002**	1.001**	1.002*	1.002*	1.001**	
	(1.001, 1.002)	(1.001, 1.002)	(1.001, 1.003)	(1.000, 1.004)	(1.001, 1.004)	(1.001, 1.002)	
Total remittances received in the past 12 months (1000 s of rupees)	1.000	1.000	1.000	1.000	1.001	1.000	1.000
	(0.999, 1.001)	(0.999, 1.001)	(0.999, 1.001)	(0.997, 1.003)	(0.998, 1.006)	(0.999, 1.001)	(0.999, 1.001)
Woman's age (years)	1.007 (0.983, 1.031)	1.004 (0.980, 1.028)	0.998 (0.972, 1.023)	1.004 (0.946, 1.067)	1.016 (0.952, 1.086)	1.007 (0.983, 1.031)	
Woman's employment status	1.456** (1.147, 1.845)	1.479** (1.161, 1.884)	1.509** (1.161, 1.963)	1.915* (1.134, 3.206)	1.356 (0.709, 2.444)	1.451** (1.144, 1.839)	
Husband resides in household	0.767 (0.500, 1.158)	0.754 (0.488, 1.149)	0.714 (0.438, 1.142)	1.809 (0.719, 4.368)	1.674 (0.611, 4.344)	0.777 (0.508, 1.173)	
Lives with in-laws	0.608* (0.410, 0.900)	0.635* (0.426, 0.945)	0.576* (0.376, 0.879)	0.589 (0.209, 1.676)	1.271 (0.409, 4.200)	0.600* (0.405, 0.886)	
Constant	0.650 (0.126, 3.527)	0.109*** (0.035, 0.328)	0.140*** (0.043, 0.449)	0.060* (0.004, 0.727)	0.035* (0.002, 0.596)	0.263** (0.096, 0.718)	0.453*** (0.374, 0.547)
N	698	689	598	184	151	698	698
Log Likelihood	-416.172	-401.646	-348.124	-81.695	-66.210	-417.103	-435.664
AIC	848.344	819.292	712.248	179.391	148.421	848.205	875.329

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

merely receiving remittances and change in freedom of movement among women is not statistically significant (OR: 0.89; 95% CI: 0.23, 4.32). However, the odds of increased freedom of movement among women who received patterned remittances, remittances every month, and remittances every three months – compared to women who received irregular remittances – are 3.49 (95% CI: 2.02, 6.41), 3.74 (95% CI: 2.12, 7.01), 3.55 (95% CI: 1.62, 8.03), respectively; these associations are all statistically significant. Notably, the higher odds of increased freedom of movement – after controlling for confounders such as amount of remittances received – among women who received patterned remittances compared to women who did not receive remittances on a fixed pattern suggests that timing of remittances drives the relationship between remittances and women's autonomy related to their own healthcare.

Our results are confirmed in additional regression models that adjust for receiving remittances directly or are restricted to women who receive remittances directly (presented in Supplemental Tables 1–6), as well as regression models that use the full KMS sample (presented in Supplemental Tables 7 and 8). When we examine only the sample of direct remittance recipients and add direct access as a control, the effects of remittance timing remain strong.

3.2. Findings from interviews

Evidence from interviews with women left-behind in Kerala supports the finding that those who receive direct access to remittances experience a higher sense of autonomy than those who do not. It also underscores the importance of considering the particular parties involved in remittance sending: not only who sends them, but also who receives them. Our qualitative interviews reveal stark differences in women's access to remittances that are sent home on their behalf, and the effect, consequently, on their autonomy. One woman, for example, told us:

> Almost all of the money he sends home is used up for running the household. The money doesn't come to me – it comes into the bank account of his younger brother, who along with my mother-in-law uses it to meet household expenses. *I have virtually no role when it comes to using the money my husband earns in the Gulf.*

This woman, like another who did not receive remittances directly, saw no benefits with respect to increased capacity for decision making or freedom of movement. Here, a young wife said that:

> I had responsibilities in the family like cooking, cleaning and helping father in cattle rearing (collecting grass, cleaning cattle shed) and also had to pay attention on my children's education. If I want to go outside for some matters, mother in law would come with me or father or brothers in law. *I had not gone outside alone while my husband was away from me*…. Father in law received the money/remittances and he used to give me to my needs.

In contrast, women who received funds directly experienced significant gains in autonomy of movement and over substantive decisions, especially if remittances were sent on a regular basis. One woman told us that:

> My husband sent money to his elder brother. He gave it to mother and she kept it. But now he is sending money to my account. It is for the last five years. I ask help/advice to his brothers and to my family, when a serious matter I face. I asked their help when we were

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Table 3
Logistic regression models estimating associations between remittance frequency and increased freedom of movement to health centers: Kerala Migration Survey, 2016. Odds Ratios (95% CI).

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Received remittances vs. no remittances at all	0.887 (0.226, 4.316)						
Received patterned vs. random remittance		3.494*** (2.019, 6.413)					
Received remittances monthly			3.738*** (2.117, 7.011)				
Received remittances every three months				3.554** (1.619, 8.025)			
Received remittances every 6–12 months					2.674. (0.894, 7.667)		
Total household income earned in the past 12 months (1000 s of rupees)	1.001**	1.001**	1.002***	1.002*	1.001	1.001**	
	(1.000, 1.002)	(1.001, 1.002)	(1.001, 1.003)	(1.001, 1.004)	(1.000, 1.002)	(1.000, 1.002)	
Total remittances received in the past 12 months (1000 s of rupees)	1.000	1.000	1.000	1.000	1.001	1.000	1.000
	(0.999, 1.001)	(0.999, 1.000)	(0.999, 1.000)	(0.997, 1.003)	(0.998, 1.005)	(0.999, 1.001)	(0.999, 1.001)
Woman's age (years)	1.042** (1.016, 1.069)	1.039** (1.013, 1.067)	1.037** (1.010, 1.067)	1.043 (0.981, 1.112)	1.085* (1.012, 1.169)	1.042** (1.016, 1.069)	
Woman's employment status	1.616*** (1.273, 2.055)	1.642*** (1.286, 2.102)	1.606*** (1.226, 2.109)	1.510 (0.876, 2.552)	1.246 (0.624, 2.305)	1.616*** (1.272, 2.054)	
Husband resides in household	0.675. (0.433, 1.034)	0.673. (0.428, 1.039)	0.553* (0.324, 0.916)	0.919 (0.336, 2.306)	0.761 (0.231, 2.185)	0.676. (0.433, 1.035)	
Lives with in-laws	0.946 (0.632, 1.427)	0.976 (0.647, 1.482)	0.861 (0.554, 1.350)	2.022 (0.681, 6.485)	2.505 (0.780, 8.915)	0.945 (0.631, 1.423)	
Constant	0.061** (0.009, 0.329)	0.020*** (0.006, 0.064)	0.021*** (0.005, 0.073)	0.010** (0.001, 0.139)	0.003*** (0.0001, 0.073)	0.054*** (0.018, 0.155)	0.428*** (0.353, 0.518)
N	698	689	598	184	151	698	698
Log Likelihood	-404.378	-388.183	-326.955	-81.924	-62.390	-404.392	-428.498
AIC	824.757	792.366	669.909	179.848	140.780	822.784	860.995

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

building the house and his brother used to come with me to banks. *Now I go to the bank and take money from my account.* Last year onwards, he was sending 15000 [approximately 210 USD] *a month.* 5000 Rs is the school fee of my daughter.

Remittance regularity appears as a central element in the narratives of women who were able to use their husbands' absence to increase, rather than decrease, their level of autonomy over crucial decisions and plan for the future, either with respect to their children's education, their health-related decisions, or as in this case, the construction of a new home.

My husband sends home around Rs. 20,000 [approximately 280 USD] *per month*, and *he sends it into my bank account.* I use some of the money to help meet the household expenses, and the rest goes into asset creation. We are planning to build a small house of our own here. We have already constructed the base for the house, and now we have a plan to go ahead and begin the actual construction of the structure.

In another woman's description of how she and her husband plan the use of their remittances, we see how they try to deal with irregularity by seeking other sources of income.

My husband sends the remittances into his own back account here in Kerala. However, I operate the account on his behalf, using presigned cheques to withdraw the cash necessary to run the household. The remittances are erratic in nature – we don't get them every month. Household expenses usually come to around Rs. 3,000 [approximately 42 USD] every month, which we meet out these remittances. If there is any need for more money here, my husband borrows money from someone else and sends it so that we face no hardship.

These reflections on household management and future planning demonstrate that remittance timing has salience in the eyes of women in migrant households. The frequency with which husbands send money home is a salient part of their family's calculations, and is meaningfully related to well-being for the women we interviewed.

4. Discussion

Our analysis suggests that migrant remittance-sending can impact sending communities not only by boosting household wealth and economic development but also through its effects on the health-related autonomy of those left behind. Specifically, we find that remittance timing—rather than amount—drives the relationship between remittances and women's autonomy over their own healthcare. Using data from the KMS 2016 household survey, we examine the effects of remitting pattern and remittance amount, looking at both regularity (whether migrants remit on a fixed pattern or not) and frequency (how often they remit). The evidence shows that "left behind" women in migrant households were more likely to report an increase in their participation in healthcare decision-making and an increase in their freedom of movement to seek healthcare when the household received remittances on a regular and frequent pattern. For an indicator of personal autonomy, we looked to women's responses to questions about their participation in decision-making and their freedom of movement in health-related matters. In both cases, women were asked if their participation or freedom has increased, decreased, or remained unchanged in the last five years.

Our models predict the impact of remittance timing – both pattern and frequency— on these indicators of autonomy, controlling for household income, total amount of remittances received, respondent's age, respondent's employment status, husband's residence, and in-law's residence. That the regularity of remittance sending is significantly associated with reports of increased participation in decision-making and increased freedom of movement suggests to us that the study of economic transactions must look beyond questions of amount. Moreover, regularity matters, but not on just any time scale—even though annual and semi-annual remittances would constitute a "regular" remittance, they did not have the same positive associations with increases in autonomy as did more frequent remittances.

In contrast to expectations derived from the literature, living with in-laws did not emerge as a significant determinant of autonomy in our sample—while there is a slight negative association between living with one's in-laws and reporting increased autonomy, this association was not statistically significant. Women's employment *is* positively associated with increased autonomy, suggesting that there exists in Kerala sufficient social and economic opportunity for women to be employed outside of the household. Yet even this effect was not as strong as that of receiving regular and frequent remittances.

This pattern invites us to consider how remittance sending is as much a social interaction as it is an economic transaction. To entrust someone with your earnings suggests confidence in their plans and alignment of financial goals. In these ways, it is a subjective indicator of confidence in the independent decision-making of the remittance recipients.

Moreover, a key component of autonomy is having the resources with which to enact one's plans. As our interviews demonstrate, remittances are often used to enact long-term plans, such as building a house, buying new land, or funding a child's education. Seeking healthcare is similarly a form of long-term planning. The decisions women make about preventative treatments, contraceptive use, or prenatal care involve intentions for their future. Part of planning for the future is having additional income at hand—but even more crucial is having the reasonable expectation that income will continue to arrive. Remittances that are regular and frequent impart and affirm expectations for future income. As such, women who receive remittances regularly and frequently have a firmer material foundation from which they can assert autonomy over decision-making, both in the short and long-term. Interview data from Kerala suggests that this is particularly salient for women left-behind when they receive remittances directly rather than through a family member. Indeed, supplementary analysis of our survey data shows that these effects are even stronger for women who receive remittances directly, rather than through a family member (See Tables S1-S6); but finding these effects even among women who receive remittances indirectly indicates the high degree to which timing matters.

With respect to their healthcare, the association between greater autonomy and better health outcomes for women is clear. When women have the capacity to plan and make choices about their own health, they and their children are healthier. Those concerned about women's health in LMIC should thus be interested in the dynamics of migration and remittance timing. Because remittance pattern and frequency are known to be shaped by institutions in destination countries, changes which facilitate frequent remittances, net of overall volume, can make a difference for women's autonomy and health by making planning more possible.

There are some limitations to this study. First, restricting our analysis to those in the gender module who are in remittance-receiving households notably reduces our sample size. In Models 4 and 5, applied to those receiving remittances every three months or even more rarely, the sample sizes are especially small, and the results of those models should be treated with caution. Limiting analysis to those women who receive remittances directly further shrinks the sample. More power could be gained with a study that explicitly oversampled women who receive migrant remittances.

Second, while Kerala is in many ways ideal as a study site we should be cautious when extending these findings to other migrant-sending communities. Kerala is particular for its density of migrant households and overall high levels of economic development and literacy. Research in other contexts have shown notable differences in the effects and uses of migrant remittances even between urban and rural areas. Further, because measures of autonomy and empowerment are context-specific, measuring changes in healthcare decision-making and freedom of movement to healthcare centers may not always be an appropriate measure for health-related autonomy (Malhotra, Schuler, & Boender, 2002).

The KMS data also does not allow us to determine the time point at which migrants began sending remittances, relative to the changes in autonomy women reported. The question asks for changes women have experienced "within the past five years." Given that short term contracts are likely between one and three years long, we can hazard that these changes are occurring on the same time scale as a single trip if there is presently a migrant sending remittances to the household. Yet we are unable to determine a causal relationship from a statistical standpoint.

While KMS does include information about migrants in the household, there is no way to determine the stability of migrants' employment during their time abroad. Our analysis thus does not account for the possibility that an unstable work situation underlies the association between irregular remittances and lower autonomy for women left-behind. However, the structure of migration to GCC countries requires all migrants to nominally have full-time employment in the destination country. Even in cases where this is violated or employment falls through, there is little reason to believe migrant's unstable employment should have a direct impact on women's healthcare autonomy, net of its effects on the regularity of remittances.

One could also argue for a reverse causality—that women who feel they are more autonomous are better able to elicit frequent and regular remittances from migrants. However, among those who reported increased autonomy and those who reported their autonomy to be decreased or unchanged, the proportion of those who had high levels of autonomy versus those with low levels of autonomy are almost identical. Additionally, there is no reason why this should be the case for healthcare autonomy in particular.

Despite these limitations, our study shows that remittance timing, net of volume, matters. This challenges the usual emphasis on remittance volume as the driving factor of social and behavioral change in sending community households. It asks us to refocus our analytical efforts on a better understanding of the social-interactional component of remittance sending, and how these interactions can shift a woman's place within the social structures of home. Just as crucially, the importance of remittance timing suggests that policymakers interested in the well-being of migrant families should renew efforts to facilitate timely and reliable remittance transfers while migrants are abroad. Lastly, this research invites us to expand our thinking about how male migration affects women left behind beyond the conventional sorting into "economic" and "social" remittances, to how the structure of migrant-family interactions can impact sending communities in important ways.

Ethical statement

The qualitative research reported in this paper arises from a project, *Migration and Kerala's Gender Paradox* directed by Hannah Bruckner at NYUAD, and was approved for expedited review by the NYUAD Institutional Review Board on January 29, 2017).

The quantitative research reported in this paper arises from a project, *Kerala Study of Migrant Families,* directed by Ganesh Seshan, then at Georgetown University, and was approved for expedited review by the Georgetown University School of Foreign Service in Qatar Institutional

Review Board on April 6th, 2016.

Both studies were reviewed and funded by the REALM project at Columbia University, directed by Peter Bearman and Charlotte Wang.

All data collection and analyses were handled to ensure that no harm could come to participants in the study by virtue of their participation and that their information would remain confidential. REALM is a part of INCITE, at Columbia University, an organization whose mission statement is, in total: "By leveraging the ideas and empirical tools of the social and human sciences, INCITE conceives and conducts collaborative research, projects, and programs that generate knowledge, promote just, equitable societies, and enrich our intellectual environment."

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Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ssmph.2019.100370.

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