

Muhammad Adeel and Anthony Gar-On Yeh

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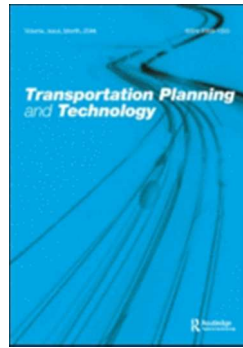
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Gendered immobility: Influence of social roles and local context on mobility decisions in Pakistan

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Abstract

This paper examines the instances of one-day immobility in Pakistan and reports its socio-demographic determinants using the nationally representative dataset of 2007 Pakistan Time Use Survey. Of 37,830 time diary respondents, nearly 30 percent respondents did not report travel during the diary day. Homemakers and those out of workforce were more likely to be immobile than employed or student respondents. Immobility rates were very high among women (55%) as compared to men (4%). Among women, those between 20 to 34 years of age, married, with children, having better education, dependent on other household members and those living in higher income households were more likely to be immobile. Excessive gender nature of immobility seems to be triggered by gender based sociocultural environment, which restricts female mobility due to family honor concerns. Other than this, those living in the provinces of Sindh and Khyber-Pakhtunkhwa or in urban areas were more likely to be immobile than those living in Punjab and Sindh provinces or in rural areas. The significant geographic effect at broader spatial scale is caused by the demographic structure as well as due to differences in social and cultural context of these areas. Finally, question regarding measurement of immobility and the potential implications of increased female immobility are discussed.

Section 1: Introduction

In its simplest sense, immobility is the binary opposite of mobility that is considered a central component of travel surveys, which represents a significant figure in travel behavior estimates. Yet only a small number of articles in travel behavior research have specifically examined this phenomenon. It has been mainly viewed as an indicator of data quality, e.g. (Hubert et al., 2008, Madre et al., 2003) and only a couple of papers have explored it as a function of personal and familial circumstances, e.g. Ureta (2008), Motte-Baumvol and Nassi (2012). None of these studies have explored the gender dimensions of immobility, particular from quantitative perspectives, although gendered mobility differences have been extensively researched within the transportation literatures (Meyer, 2004).

The topic of immobility is worth studying for two major reasons. Firstly, that the share of the immobile has had a strong impact on average mobility levels and activity participation. Secondly, because increased instances of immobility are of special concern to the policymakers who aim to facilitate the mobility and accessibility of disadvantaged groups, particularly women, in order to reduce their social exclusion (Lucas, 2011, Lucas and Currie, 2012).

This paper aims to go some way towards filling this research gap. The results that are presented here represent an analysis in a specific geographical and social context, Pakistan, and so may not necessarily be representative of other contexts. Nevertheless, this study makes a unique contribution by demonstrating how the study of immobility (rather than mobility) can be used to explain mobility inequality and the differential effects of local context on mobility decisions across men and women.

Pakistan makes an interesting case for this analyses because of wide gender differences in mobility as well as due to strong influences of gender ideologies in almost every aspect of day to day life, be

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3 it access to employment (Roomi and Parrott, 2008, Naqvi et al., 2002), education (Sawada and
4 Lokshin, 2001), healthcare (Mumtaz et al., 2003) or wider political and social participation (Kayani
5 and Rafi, 2013). In this paper, we specifically explore gender differences in immobility and report
6 upon its socioeconomic determinants by exploiting the 2007 Pakistan Time Use Survey (PTUS). We
7 seek answer to the two important questions: i) Do men and women experience similar levels of
8 immobility? ii) How do various demographic factors and sociocultural context shape the instances of
9 immobility across gender? Our work complements existing knowledge and provides new evidence
10 on the differential influence of individual and household related characteristics on immobility among
11 gender.
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14 Section 2 summarizes the literatures from international and Pakistani contexts. Section 3 describes
15 the dataset and procedure of measurement. Section 4 presents the results and discussion whereas,
16 Section 5 concludes with comments on the potential impacts of increased immobility amongst
17 Pakistani women and ways to deal with it.
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19 **Section 2: Literature review**

20 **Mobility and Immobility: A conceptual couple**

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Immobility contrasts with mobility in that it represents the absence of travel. Mobility in
itself is a broad concept that encompasses physical, virtual and imaginative movement of
humans, physical objects in space and time (Urry, 2007). In the fields of transportation,
geography and planning; mobility is measured by corporeal travel that is often short-term,
repetitive and flows designated as 'circulation' (Zelinsky, 1971). In this sense, immobility is
its binary opposite and those who do not yield a single trip during a given period of time,
usually one day, are considered immobile (Levinson and Kumar, 1995). Authors like
(Cresswell, 2012) contend that mobility cannot be perceived without immobility calling
them a conceptual couple which neither a dualism nor an opposition, rather a relational
continuum (Pellegrino, 2011).

Mobility enables people's access to opportunities and services; and is considered important
for social inclusion (Social Exclusion Unit, 2003, Preston and Rajé, 2007), better quality of life
(Urry, 2000, Miller, 2003) and personal wellbeing (De Vos et al., 2013, Metz, 2000,
Schwanen and Wang, 2014). Reduced mobility is linked with inadequate service availability
(Jones and Lucas, 2012, Lucas, 2012, Lucas, 2004, Grieco et al., 2000, Hine and Mitchell,
2003, Hine and Mitchell, 2001a, Spinney et al., 2009), vulnerability to social isolation and
decline in physical and mental health (Bassett Jr et al., 2008, Hine and Mitchell, 2001b). In
that case, immobility represents an extreme expression of inequality and reduced
accessibility in which an immobile would be considered as disadvantaged when compared
to even with a least mobile person. In a society that values mobility, immobility heightens
inequality and the excessive immobility looks particularly troubling to the governments that
aim to reduce economic disparities and facilitate mobility of disadvantaged groups.
(Hanson, 2010) elaborates that gender and mobility are inexplicably interlinked and shape
each other in both visible and invisible ways. Mobility presents resourcefulness, freedom
and an agent of change to the existing power structure between genders. On the other
hand, denial of mobility or enforced immobility is often seen a way to 'keep women in a
subordinate position or sustain gender traditional gender relations'.

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3 A higher mobility, on contrary, may not necessarily represent increased accessibility as it is
4 not the only way to reach services (Cass et al., 2005), facilities and social networks (Urry,
5 2012). Increased mobility can be an issue for the traveller and if incurs undesired costs
6 (Johnson et al., 2009). Same goes with immobility, not all of it may represent a problem.
7 People may choose to remain immobile on a particular day voluntarily, or even if they are
8 somehow involuntarily remain immobile, they may still remain active and contended (Urry,
9 2007). Similarly, in certain cases when mobility causes potential risk to the traveler,
10 immobility becomes a strategy to control risk as well (Pellegrino, 2011). Work by Lund et al.
11 (2013) demonstrates that both immobility and mobility can be effective strategies to
12 improve livelihoods or may lead people into a spiral of declining wellbeing. It is clear that
13 the effects of mobility and immobility (both positive and negative) are not always
14 straightforward, particularly when gender is taken into account. In order to better
15 understand the gender and mobility nexus, Hanson (2010) rightly calls for greater
16 understanding of 'gendered meanings and power relations embedded in various forms of
17 mobility and immobility' and that also from different social and geographical contexts.
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21 **Social context of mobility in Pakistan**

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24 Pakistan houses 188 million population with 39 % of them living in urban areas (Planning
25 Commission, 2014). The country ranks low on Human Development Index (164) and its
26 demographic data highlights wide gender differences in access to education, healthcare and
27 economic resources (Haider, 2014, UNDP, 2013, Aurat Foundation, 2012a). Country's
28 sociocultural context exerts significant constraints on women and its issues related to
29 female empowerment and freedom of choice are widespread (Heward and Bunwaree, 1999,
30 SDPI, 2008).
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33 Social values in Pakistani society delineate a gender based code of honor where female are
34 considered private and homemakers while male are considered public and breadwinners
35 (Jejeebhoy and Sathar, 2001). The homemaking and private role make women a symbol of
36 family honor which is upheld by their seclusion from outside world (Papanek, 1971). A
37 female and her family is dishonored if she does not observe seclusion or starts an
38 interpersonal relation (sexual or nonsexual) with unrelated men without marriage (Mumtaz
39 et al., 2012).
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42 Female mobility and honor are closely linked (Sathar and Kazi, 2000). Mobility carries the
43 risk of dishonor as it results in leaving the seclusion and travelling through public spaces.
44 The risk is minimized by controlling female mobility through social practice of permission
45 before travel and ensuring their escort or veiling (purdah) during travel (Aurat Foundation,
46 2011).
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49 As a result, sociocultural environment shapes female mobility decisions, how she travels,
50 where she goes and for what purposes (Mumtaz and Salway, 2005, Haque, 2004, Adeel et
51 al., 2014). Mobility control is somehow lenient for subsistence travel (such as fetching water
52 or going to work) and stricter for discretionary activities as nobody wants to be dishonored
53 for an 'unnecessary' activity (Population Council, 2003). This phenomenon of socially
54 acceptable mobility shapes female's mode choice as well. Walking and travelling on public
55 transport are discouraged because they might create an environment for male and female
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interaction. On the other hand, travelling on personal automobile is considered a symbol of honor as it preserves their seclusion during mobility (Adeel et al., 2016).

The level of adherence to these mobility restrictions varies across individuals, households and communities (Mumtaz et al., 2003, Government of Pakistan, 2003b). Mobility control is often stricter for unmarried and adult women. Some tribes and localities, particularly from the remote area, exhibit greater adherence than the rest. On the other hand, some women and their households do find ways to circumvent these restrictions by emphasizing women empowerment and equality of rights between gender (Khan, 1999). While these social factors have been qualitatively explored in a number of studies, a quantitative examination of their effect is lacking in literature.



Figure 1: Provinces of Pakistan and areas excluded in the 2007 Pakistan Time Use Survey

Immobility in activity surveys

Trip-based Household Travel Surveys (HTS) and activity-based Time Use Surveys (TUS) record immobility in different ways (Bose and Sharp, 2005). In HTS, those who do not report travelling during the survey day are considered immobile; whereas in TUS, the immobile are

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3 those who report staying at home during the survey day. This difference of definition
4 creates significant variation in resulting estimates (Clarke et al., 1981). For example,
5 Armoogum et al. (2004) report immobility rates in France as 17% by NPTS and 8% by TUS,
6 carried out in 1994 and 1999, respectively. Richardson (2007) found that the immobility
7 rate in Australia was 11% in the 1997 TUS and 17% in the Victorian Activity Travel Survey
8 1994-1997. Studies have shown that both surveys tend to overestimate the results but TUS
9 give more realistic results (Noble, 2001). Madre et al. (2007) suggest that normal immobility
10 rates should range between 8-12 % for one-day diary and should reduce further for longer
11 observation period. However, immobility rates in developing countries are found to be
12 much higher than those reported from the developed countries. For example, Motte-
13 Baumvol and Nassi (2012) noted immobility rate in Rio de Janeiro at 45%, Elias and Shiftan
14 (2014) report the share of immobile population at 55% among Jordanian women and 37 %
15 among Arab Israelis. Similarly, Baker et al. (2005) noted 55% immobility rates in their
16 Greater Mumbai Household Travel Study from India, all for one day travel diary surveys.
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20 Immobile populations exhibit similar characteristics across all study areas. Previously quoted
21 studies on immobility found that unemployed, home-based workers, poor, elderly, disabled,
22 low density or rural residents, carless, non drivers, or those with limited access to public
23 transport, were significantly more likely to report immobility than others. These groups of
24 population are often considered vulnerable to transport related exclusion (Lucas, 2012).
25 However, the question about implications of immobility has obtained somewhat mixed
26 response in travel behavior research. Immobility studies carried out so far seem to develop
27 along two strands. Both strands consider immobility as an issue, but of different nature.
28 The first strand views immobility as a random phenomenon caused by higher levels of soft
29 refusals in the data collection process (Armoogum et al., 2004). Considering it an issue of
30 data quality, it aims to reduce immobility by improving data collection methods (Tomás et
31 al., 2008). The second (and arguably more important) strand of knowledge on immobility
32 has increased attention to its underlying causes and potential impacts on individuals. This
33 strand broadly links immobility to the larger debates on mobility inequality and effect of
34 transport related exclusion on individuals' lives (Currie et al., 2010, Lucas, 2004, Hine and
35 Mitchell, 2001b, Hine and Mitchell, 2001a, Hine and Mitchell, 2003). The more limited
36 volume of literatures on mobility and livelihoods issues from these countries highlights that
37 non-economic factors such as social norms and cultural practices play a significant role in
38 shaping mobility of women in these area (Hou and Ma, 2013, Porter, 2002, Mumtaz and
39 Salway, 2005, Hirway and Antonopoulos, 2009).
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45 **Section 3: Data and methods**

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48 The 2007 Pakistan Time Use Survey, the only national study of time use of the country,
49 aimed to quantify the paid and unpaid work time among women for a more equitable
50 allocation of resources across gender (Pakistan Bureau of Statistics, 2008). The survey is
51 representative of its national and provincial populations across urban and rural areas.
52 Pakistan Bureau of Statistics (PBS) used a multi-staged stratified random sampling
53 methodology to select 19600 sample households for the survey. Data was collected using
54 two questionnairesⁱ. First questionnaire recorded the household demographic information
55 and the second questionnaire recorded demographic information and yesterday's time use
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3 diary of two household members, who were at least 10 years old. The diary respondents
4 were selected systematically using a Kish Table of person's rank in the household.
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6 The survey collected data from January 2007 to January 2008, roughly equally from each
7 month and day, so as to cover seasonal variations. The sample excluded Federally Azad
8 Tribal Areas (FATA) and some areas of Khyber Pakhtunkhwa (KPK) Province (Figure 1). It also
9 did not cover military areas, hotels, prisons and homeless individuals and children below 10
10 years of age, that as a whole make up to 22 percent of national population. PBS conducted
11 pen and paper based home interviews, digitized the filled survey forms and provided
12 preprocessed Stata files for general public download through their website for free.
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15 A total of 37830 time use diaries with complete data have been provided in the
16 downloadable dataset that shows a low drop out rate of around 3.5%. The survey
17 organization attributes it to strategies such as multiple visits, help from local political
18 leaders and hiring local female interviewers.
19

20 **Social role of respondent**

21
22 Main social role of the diary respondent was identified using three employment related
23 questions. Those who reported working for personal or family gain for at least one hour a
24 day during past week were marked as 'employed' and sub categorized into 'paid workers' if
25 they gained economic benefit or 'unpaid workers', otherwise. The non-workers were
26 labeled as students or homemakers if they reported so in the question related to the reason
27 for non-working. Remaining choice options for not working (e.g. laid off, retired, etc.) were
28 grouped as 'other'.
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32 **Measurement and potential sources of bias**

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34 Time use diary noted daily time use in 30 minutes time episodes. Each episode noted up to
35 three activities undertaken and their context location. Following the United Nations
36 recommended International Classification of Activities for Time Use Surveys (ICATUS), the
37 survey divided all possible human activities, in 123 detailed activity codes out of which 23
38 codes specifically enquired about travel. Respondents who did not report any travel activity
39 in the diary were identified as immobile.
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42 The PTUS does overestimate immobility rate because of the following two reasons. Firstly,
43 travel is somewhat less precisely defined in the survey. The immobile respondents that
44 would have moved inside the home obviously, might also have made short trips outside
45 home without considering it a 'travel'. This possibility is supported by the fact that
46 boundaries between dwelling and neighborhood can be blurred and fluid, especially in rural
47 areas. The effects of this possibility are not directly measurable. Secondly, the diary notes
48 up to three activities in thirty minute long episodes. There is a possibility that travel might
49 have occurred as the fourth activity and hence it was not recorded. However, the data
50 shows that only two percent episodes noted three activities, and travel was most likely to
51 be noted as first activity. Hence, the chances of missing travel remain slim, although
52 significant.
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Section 4: Results and discussion

A gendered phenomenon

As shown in table 1, approximately 30.1 percent did not report any trip on the diary day. However, gender disaggregation shows that women made up to 95 percent of all immobile respondents. Women were more likely to stay at home than making trip outside, as 55 percent of them reported immobility as compared to only 3.6 percent men reporting so. Motte-Baumvol and Nassi (2012) has previously found that immobility is closely linked with the employment status of individuals. Our data partly confirm this finding.

Table 1: Immobility rate across men and women: overall and by main activity

	Men (N= 18,321)	Women (N= 19,509)	All (N=37,830)
Overall			
Reported travelling	96.4	45.0	69.9
Did not report travel	3.6	55.0	30.1
By social role			
Employed	01	31	07
Regular worker	01	17	03
Self employed	02	44	05
Casual worker	01	43	09
Unpaid family worker	01	26	15
Student	03	22	11
Homemaker	33	69	69
Other	19	59	40

Source: Author's calculations

Respondents who were involved in some kind of out-of-home activity were less likely to be immobile. Share of non-trippers was clearly lower among employed and students (7 and 11 percent, respectively) as compared to homemakers and 'other' category respondents (69 and 40 percent). Within employed population, regular workers exhibited least while the unpaid family workers reported highest immobility (3 and 15 percent, respectively). The results are consistent with previous studies that show that the unpaid family workers often worked from home which reduces their chances of travel (Khan, 2007).

High instances of immobility among women suggest that gender related socioeconomic attributes might exert significant influence on their mobility decisions. It is well known that the country exhibits wide gender gap in most of the socioeconomic indicators (UNDP, 2013). PTUS data also highlights that, as compared to men, female were more likely to be homemakers, illiterate, married, in the age of puberty between 10 to 44 years age, and less likely to own any income (Table 2). In next section we analyze which of these demographic attributes play a significant role in mobility decisions in the country.

Table 2: Gender comparison on selected demographic characteristics (in percent)

Demographic indicators	Men	Women
Main activity		
Employed	69	17
Student	20	14
Homemaker	1	59

Other	10	10
Education level		
No formal education	31	58
Less than 10 years	44	28
More than 10 years	24	14
Marital status		
Never married	44	35
Currently married	56	65
Age of respondent (years)		
10 to 44	77	81
45 to 65	17	15
65 and above	6	4
Personal income		
No income	30	77
Any income	70	23

Source: 2007 Pakistan Time Use Survey

Individuals and familial circumstances have a significant effect:

Immobility increased with the ageing, both among men and women. However, there were two significant gender differences by age groups. Firstly, the age factor becomes significant among women, from the age of 15, when their honor concerns arise and they start observing purdah, but after the age of 25 among men. Secondly, during 45 to 64 years of age, immobility rates halted among women, when their honor concern decrease considerably with ageing. In elderly stages of life, immobility levels reach an all-time high, among men and women both. However, women experience greater negative effects than men as elderly men keep visiting nearby religious and social places but these travel routines remain scare among women due to lack of opportunities for elderly women.

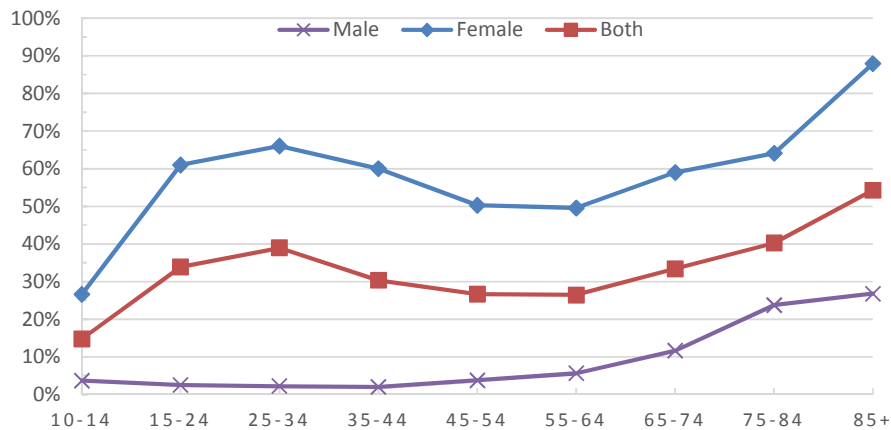


Figure 2: Immobility rate by age of the respondent in 2007 Pakistan Time Use Survey

Source: Author's calculations

Table 3 presents the results of logistics model, which examines the effect of important demographic variables such as age, marital status, education, household and personal income, vehicle ownership and location of residence on gendered mobility decisions in the country.

Main activity of respondent was the strongest predictor of immobility. As compared to the reference category of paid workers, immobility levels were significantly higher among homemakers and 'other'

respondents, both among men and women. Surprisingly, students and unpaid workers exhibited no different immobility levels than paid workers when controlled for other demographic factors. This conforms to the idea that travel is mostly a derived demand and that having some kind of task was necessary for being mobile even when majority of travel is done walking.

Age of respondent was also positively associated with mobility decisions. However, there are two significant gender differences by their age groups. Firstly, that the age factor came into effect at the age of 25 among men whereas it started much earlier among women, from the age of 15. This is linked with gradually strengthening honor related mobility concerns among women and their families with the start of adulthood. Secondly, during late adulthood age of 45 to 64 years, immobility rates stop increasing among women whereas keep increasing among men. A significant decrease in female immobility during the age of 45 to 64 is evident in Figure 2 as well. This is probably due to the fact that female honor and privacy concerns decrease during this age, as they become mothers of grown up children who become chaperone for them. Female mobility restrictions also relax during this age, as they become relatively more empowered and also the fact that they are less likely to become a target of street harassment in this age. However, in late elderly stages of life, immobility levels reach an all-time high among men and women. This happens because of a deteriorating physical health as walking becomes increasingly difficult in 70s and afterwards. During this age period, female immobility remains twice higher than their male counterparts as elderly men keep visiting nearby religious and social places. It is expected that ageing might has a stronger effect on women as they lose both the purpose of mobility and the ability to walk in later stages.

Table 3: Logistic model of immobility showing differential effect of socio-demographic indicators across men and women

	Men				Women			
	Coeff.	SE	Wald Chi2	Pr> Chi2	Coeff.	SE	Wald Chi2	Pr> Chi 2
Intercept	3.0393	0.4078	7.45	***	1.7599	0.2232	7.88	***
Age: (reference: 10-14 years)								
15-24					-0.905	0.062	-14.6	***
25-34	-0.954	0.231	-4.13	***	-0.781	0.080	-9.82	***
35-44	-1.044	0.271	-3.86	***	-0.490	0.085	-5.78	***
45-54	-1.437	0.268	-5.35	***				
55-64	-1.130	0.273	-4.15	***				
65-74	-1.036	0.272	-3.81	***	-0.328	0.117	-2.8	**
75-84	-1.410	0.286	-4.92	***	-0.480	0.181	-2.66	**
85 +	-1.548	0.379	-4.09	***	-1.837	0.417	-4.4	***
Social role (reference: paid worker)								
Unpaid worker								
Student	-0.505	0.395	-1.28		0.358	0.221	1.62	
Homemaker	-3.046	0.423	-7.2	***	-1.459	0.213	-6.85	***
Other	-1.664	0.368	-4.52	***	-1.245	0.218	-5.7	***
Married					-0.258	0.058	-4.42	***

Education	0.147	0.031	4.71	***				
Personal income (reference: no personal income)								
Up to 4000	0.854	0.393	2.17	*				
4001-7000	0.892	0.405	2.2	*	0.721	0.249	2.9	***
7001-10000	1.317	0.459	2.87	**	0.473	0.275	1.72	.
Above 10000	1.153	0.427	2.7	**	0.733	0.274	2.67	**
Household income (reference: less than 4000)								
4001-5000					-0.272	0.060	-4.53	***
5001-7000					-0.303	0.052	-5.86	***
7001-10000					-0.376	0.053	-7.05	***
Above 10000					-0.433	0.058	-7.51	***
household vehicle type owned								
Car	-0.841	0.168	-5	***	0.169	0.074	2.28	*
Cycle	0.165	0.096	1.72	.	0.101	0.036	2.83	**
Motorcycle	0.219	0.133	1.64		-0.082	0.047	-1.73	.
Personal income source (reference: Wage-Salary)								
Self employed					-0.492	0.121	-4.07	***
Other members								
Else								
No income	(Omitted)							
Feelings (reference: not busy enough)								
Comfortable	1.024	0.123	8.33	***				
Too busy	0.988	0.149	6.65	***				
Urban residence	-0.239	0.096	-2.49	**	-0.166	0.038	-4.43	***
Province (reference: Punjab)								
Sindh	0.476	0.127	3.75	***				
KPK	0.588	0.132	4.45	***	-0.221	0.048	-4.56	***
Baluchistan	0.632	0.174	3.63	***	0.290	0.057	5.06	***
Model Summary								
N	17720				18826			
Model chi2	1256.55				3808.46			
Prob > chi2	0.0000				0.0000			
Pseudo R2	0.2312				0.145			
Log likelihood	-2089.23				-11087.211			

Key: '+' p < .10; '*' p < .05; '**' p < .01; '***' p < .001

Different: significant in one sex, insignificant in other

Opposite: significant and opposite direction of effect across sexes

Same: significant and similar direction of effect across sexes

Marriage increases female immobility but remains insignificant for men as moving into husband's home after marriage brings new set of household responsibilities for women and they often need to take permission from husband and his parents for travelling outside home (Mumtaz and Salway, 2005).

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3 Increasing education significantly decreases male immobility as it increases their chances of finding
4 work. Whereas, getting education barely affects female mobility decisions, as they are mostly
5 involved in homemaking roles.
6

7 Personal income decreases immobility across gender. However, having a small personal income of
8 less than Rs. 4,000 remains insignificant for women mobility as they may earn a small income either
9 by working from home or they often get pocket money from other members of family. Household
10 income also emerges as a significant predictor of immobility among women. Women living in higher
11 income households have significantly higher risk of immobility relative to the lower income
12 households. Women from poor households often leave their home for finding work or necessities
13 like water which increases their mobility chances (Mumtaz et al., 2003). Similarly, personal source of
14 income also significant effected women mobility decisions. Self-employed women were significantly
15 more likely to remain immobile than those working for wage or salary because the former are often
16 home based workers (Khan, 2007).
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19 With household car, instances of immobility significantly decreased among women but increased
20 among men, showing the rising importance of personal automobile for female mobility in the
21 country. Similarly, bicycle decreased immobility whereas motorcycle increases female immobility but
22 remains insignificant for male respondents. Effect of household vehicle on immobility seems more
23 complex needing further investigation.
24
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26 Feelings of being busy had a significant effect on male immobility. Those who reported having
27 comfortable things to do or being too much busy were less likely to remain immobile than the
28 reference category group of those reporting 'not busy enough'. In contrast, workload remained
29 insignificant for female respondent. It also suggests that the broader sociocultural mobility
30 constraints keep them at home even if they have some free time at their discretion.
31

32 Respondents from urban areas were significantly more likely to report immobility than their rural
33 counterparts. These geographical differences are associated with variation in the level of physical
34 development among urban and rural areas. Urban areas exhibit higher access to services and
35 amenities at home whereas rural population often need to travel outside for even basic services that
36 increases their chances of mobility. At provincial level, as compared to the reference category of
37 Punjab province, living in Sindh significantly decreased the risk of immobility among men but
38 remained insignificant for women. Similarly, living in Baluchistan decreased immobility among men
39 and women, both. whereas, in KPK, the risk of immobility increased among women and decreases
40 among male. These significant differences are mainly caused by the interprovincial differences in
41 social norms. The province of KPK houses conservative Pashtun tribes that strictly practice female
42 *pardah* (privacy) whereas Punjabi women are often involved in out of home tasks, particularly in
43 rural areas (Government of Pakistan, 2003b). Similarly, men in KPK make more frequent trips to
44 nearby community places for social and religious purposes (Government of Pakistan, 2003a). The
45 fact that Baluchistan exhibits least level of development helps decreases immobility levels in the
46 province as its resident need to reach out for accessing basic facilities (Government of Pakistan,
47 2003b).
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51 **Contextual influence on the determinants of immobility**

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54 As shown in Table 4, at provincial levels, immobility rates remained below average in Punjab and
55 Baluchistan (28.7%) and above average in Sindh and KPK (32%). This pattern was more pronounced
56 in women respondents and their share of immobility rose to 59.1% in the former but lowered to
57 51.9 % in the latter region. Urban and rural areas also exhibit similar pattern. In the regions of high
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female immobility, male exhibited lower immobility rates showing that women were more likely to be secluded if their men were more outgoing.

Table 4: Share of immobile men and women across Pakistan

	Punjab and Baluchistan	Sindh and KPK	Overall
Women			
National	51.9	59.1	54.9
Urban	56.4	57.6	56.9
Rural	49.1	59.9	53.7
Men			
National	4.4	2.6	3.6
Urban	4.5	3.0	3.9
Rural	4.3	2.4	3.5
All			
National	28.7	32.0	30.1
Urban	30.7	30.3	30.5
Rural	27.5	33.1	29.8

Source: Author's calculations

As shown in table 5, the provinces of Sindh and KPK exhibited distinct composition of demographic and sociocultural characteristics that increased their female immobility. For example, these provinces exhibits 11 percent higher share of homemaker women than Punjab and Baluchistan. Similarly, the share of employed and student population is also 5 to 6 percent point lower in the former region than the latter. A significantly greater share of women in Sindh and KPK region is illiterate, currently married or in the puberty age of 15 to 45 years. The effect of these demographic characteristics on immobility is well noted in Table 3.

On sociocultural differences, the high immobility region, particularly KPK, is characterized by more rigid adherence to female seclusion and purdah practices in the country (Haroon, 2010). Similarly, the nationally study on female harassment has documented significantly higher sensitivity to street harassment in Sindh and KPK (Aurat Foundation, 2012b). Other studies note that Baluchistan women are often involved in fetching water from distant places (Government of Baluchistan, 2011) while Punjabi women are also known for working in the agricultural fields (Government of Punjab, 2008). While the influence of cultural variations in mobility and activity uptake is remains less researched, the exert significant influence in shaping female immobility in the country (Mumtaz and Salway, 2005).

Table 5: Comparison of Low and High female immobility regions on selected female demographic characteristics (in percent): Pakistan Time Use Survey, 2007

	Punjab and Baluchistan	Sindh and KPK
Main role		
Employed	19	14
Student	17	11
Homemaker	54	65
Other	10	10
Formal education		

No education	53	64
At least one year	47	36
Marital status		
Never married	35	33
Currently married	65	67
Age of respondent		
10-44	80	81
45-65	15	15
65+	05	04
Personal income		
No income	84	68
Any income	16	32

Source: 2007 Pakistan Time Use Survey

In table 6, the previous model of female immobility is presented separately for the high and low female immobility regions. Results indicate that previously found relationship persists but significant variations are also apparent between the two regions. For example, during 45-64 years of age, women immobility continued rising in KPK and Sindh whereas it remained insignificant at Punjab and Baluchistan region.

As compared to the employed women, unpaid workers and student exhibited significantly lower immobility in KPK and Sindh. Similarly, the effect of personal income becomes significant only in high immobility area and that also for the upper income quintiles only.

With increasing education, immobility decreased in Sindh and KPK but increases in the Punjab and Baluchistan region. It shows the potential of education for increasing female mobility and access to services in the high immobility region.

Household income effects appeared consistent across both regions but a small household income did not significantly increase female immobility in Sindh and KPK. Similarly, the significant positive effect of personal income vanishes in low immobility regions and becomes moderately significant for upper income quintiles in the other.

In Sindh and KPK, presence of household car had a negative influence on female immobility whereas motorcycle had a positive influence showing the importance of 'secluded mobility options' for female mobility in the high immobility region. On the other hand, availability of bicycle increase chances of female mobility in Punjab and Baluchistan showing that cycle might be an acceptable mobility option for women as a pillion rider in this region.

Table 6: Logistic models of women immobility for high and low immobility regions

Dependent variable: Mobility; Mobile =1, Immobile=0	Punjab and Baluchistan (low immobility region)				Sindh and KPK (High immobility region)			
	Coeff.	SE	Wald Chi2	Pr> Chi2	Coeff.	SE	Wald Chi2	Pr> Chi 2
Intercept	1.9567	0.2788	7.02	***	1.2446	0.3837	3.24	***
Age: (reference: 10-14 years)								
15-24	-0.7533	0.0831	-9.06	***	-1.0777	0.0952	11.32	***
25-34	-0.5558	0.1089	-5.1	***	-1.0323	0.1185	-8.71	***

35-44	-0.2758	0.1154	-2.39	*	-0.7476	0.1272	-5.88	***
45-54	0.1787	0.1226	1.46		-0.2352	0.1331	-1.77	†
55-64	0.2867	0.1327	2.16	*	-0.2697	0.1468	-1.84	†
65-74					-0.4868	0.1796	-2.71	**
75-84					-0.8326	0.2970	-2.8	**
85 +	-1.7545	0.4964	-3.53	***	-2.0432	0.7658	-2.67	**
Social role (reference: paid worker)								
Unpaid worker					0.7440	0.3757	1.98	*
Student					0.9359	0.3856	2.43	*
Homemaker	-1.6517	0.2637	-6.26	***	-0.9492	0.3715	-2.56	**
Other	-1.3676	0.2710	-5.05	***	-0.7982	0.3787	-2.11	*
Married	-0.3267	0.0807	-4.05	***	-0.1718	0.0863	-1.99	*
Education	-0.0803	0.0163	-4.93	***	0.0535	0.0196	2.72	**
Personal income (reference: no personal income)								
Up to 4000								
4001-7000								
7001-10000					0.7815	0.4612	1.69	†
Above 10000					1.2225	0.4665	2.62	**
Household income (reference: less than 4000)								
4001-5000	-0.4197	0.0794	-5.28	***				
5001-7000	-0.4080	0.0692	-5.9	***	-0.1500	0.0791	-1.9	†
7001-10000	-0.4486	0.0709	-6.32	***	-0.2305	0.0813	-2.84	**
Above 10000	-0.5319	0.0769	-6.92	***	-0.3056	0.0879	-3.48	***
Household vehicle type owned								
Car					0.2547	0.1124	2.27	*
Cycle	0.1104	0.0445	2.48	*				
Motorcycle					-0.1826	0.0842	-2.17	*
Personal income source (reference: Wage-Salary)								
Self employed	-0.4145	0.1457	-2.85	**	-0.6935	0.2288	-3.03	***
Other members								
Else								
No income	Omitted							
Feelings (reference: not busy enough)								
Comfortable	0.2588	0.0511	5.07	***	-0.3691	0.0596	-6.2	***
Too busy	0.2840	0.0602	4.72	***	-0.2999	0.0702	-4.27	***
Urban residence	-0.2109	0.0484	-4.36	***				
Model Summary								
N	10846				7980			
Model chi2	2290				1563			
Prob > chi2	0.0000				0.0000			
Pseudo R2	0.1525				0.1447			
Log likelihood	-6367				-4621			

Key: ' ' p < .10; '*' p < .05; '**' p < .01; '***' p < .001

Different: significant in one sex, insignificant in other

Opposite: significant and opposite direction of effect across sexes

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3 Same: significant and similar direction of effect across sexes
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6 Another interesting regional effect is observed for the level of workload on female immobility that
7 was found insignificant at national level. Female immobility decreased with their busier routine in
8 Punjab and Baluchistan but increased in Sindh and KPK. It shows that, with increasing workload,
9 women were more participating in outside-home activities in Punjab and Baluchistan but stayed
10 inside home in Sindh and KPK provinces.
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12 **Section 4: Conclusions**

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15 Our study explored how, and to what extent, demographic and sociocultural construction constrains
16 mobility decisions across men and women in the Pakistan society. Analysis of the 2007 Pakistan Time
17 Use Survey showed that nearly thirty percent respondents did not report travel on the diary day.
18 Gender disaggregation indicated that females were more likely to stay at home than reporting travel
19 on a random day. Such wide gender gaps in immobility have not been reported previously in the
20 literature.
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23 Using binary logit model, this paper found that Immobility is closely linked with social role of the
24 respondent. Homemakers were significantly more likely to report immobility than students or
25 employed respondents. However, women were more likely to be stay at home all day in every social
26 role. Gender disaggregated immobility model (Model 1) highlighted a differential effect of individual
27 and household related demographic variables across men and women. Effect of age was particularly
28 revealing about the social constraints. Female immobility rates increased during the period of early
29 and peak adulthood and later eased out during late adulthood. In elderly stages, female immobility
30 rates were nearly twice greater than male showing a potential lack of suitable activity options and an
31 increased vulnerability to exclusion. Other than this, being married, having better education, living in
32 higher income household, or being self-employed increased immobility among women. While being
33 employed or student, having as personal monthly income of above Rs. 4000 or having a car in the
34 household significantly reduces their immobility rates. For men, increasing age, living without job,
35 having no personal income, having low education and having nothing to do tend to increase their
36 immobility. Living in urban areas or in the provinces of Sindh or KPK also increased immobility, more
37 pronouncedly among women. This spatial dimension of immobility, at broader geographical scales,
38 was primarily linked with differences in demographic structure of their populations as well as with
39 differences of their cultural contexts as purdah observance is stricter and female have limited out of
40 home activity participation in high immobility regions.
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45 While female exhibit increased immobility, it is hard to guess its causes with the PTUS dataset.
46 Women might have remained immobile because they wanted to do so. At the same time, gender
47 related mobility constraints caused by household responsibility, societal norms and cultural values
48 seems influential as well. The consequences of immobility also remain complex to decipher
49 especially when it is measured with one-day data. Yet, excessive immobility may put a considerable
50 portion of women, especially those in adulthood age, on the verge of exclusion from important
51 services such as education, healthcare and employment. At the same time, immobility may
52 considerably reduce their physical activity levels, resulting in long term issues of obesity, declining
53 physical health and general wellbeing.
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56 Nevertheless, suitable policy responses to immobility (in Pakistan and similar elsewhere) should aim
57 to increase female participation in employment, education and leisure activities as well as at
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3 enhancing public awareness on the issue. Transportation and urban planning policies have an
4 important role to play for this. In a country that is predominantly a walking-based society, built
5 environment is barely suitable for active mobility of women. Women generally avoid walking in
6 streets and roads due to their safety and privacy concerns. And their families do not permit them to
7 travel without veiling, escort or making frequent trips because of these mobility issues. Creating
8 gender friendly streets, public spaces and transport options would surely encourage female mobility,
9 and would also help creating gender equality in the country. Building pedestrian walkways are
10 equally important for urban mass transit programs since the access to bus stops often requires a
11 considerable and a difficult walk. Provision of gender friendly leisure places is also important so as to
12 provide homemaker women and elderly with suitable destination choices for regular physical
13 activity. In many cities of the country, female-only parks are quite popular among women and their
14 households, as compared to mixed gender parks, because gender segregated facilities conform to
15 the powerful social principles of female seclusion in the country.
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19 A slow but gradual change in the cultural perspectives on females right to mobility is also desired. It
20 is expected that a significant portion of women would welcome the opportunities to be mobile
21 keeping that their honor concerns are addressed properly. Media campaigns regarding valuing
22 female mobility and respecting their mobility needs would also be useful in this regard. With
23 ongoing trends of increasing education and rising employment among women, demand for a female-
24 friendly mobility environment will keep increasing and probably will trigger actions for reducing
25 female immobility in the near future.
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28 We need further studies, spreading over multiple days or even months as well as in depth
29 understandings to fully appreciate the causes and effect of immobility on people's accessibility and
30 social inclusion. Exploring women's perspective on the causes and impacts of immobility are
31 essential to provide a more credible set of interventions for improving their mobility. A context
32 specific approach that would take into account the social, cultural and geographical factors at
33 individual, household and broader societal level is needed to better conceptualize the problem and
34 its impacts. A mixture of quantitative with qualitative perspectives would certainly improve our
35 understanding about how does mobility concerns lead to immobility and what does it means to be
36 immobile for one or more days.
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