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# HOW DO IMMIGRANTS SPEND THEIR TIME?:

## THE PROCESS OF ASSIMILATION

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## Abstract

Sharp differences in time use by nativity emerge when activities are distinguished by incidence and intensity in recent U.S. data. A model with daily fixed costs for assimilating activities predicts immigrants are less likely than natives to undertake such activities on a given day; but those who do will spend relatively more time on them. Activities such as purchasing, education, and market work conform to the model. Other results suggest that fixed costs for assimilating activities are higher for immigrants with poor English proficiency or who originate in less developed countries. An analysis of comparable Australian data yields similar results.

### Keywords

time use; fixed costs; incidence; intensity

## 1 Introduction

In this study we focus on assimilation as what immigrants do that might enable some of them to assimilate while others do not. In the past 40 years there have been immense numbers of economic studies that have focused on assimilation. With the exception of studies of labor supply, however, all of these have examined the outcomes of the process, not the process itself. Thus Chiswick's (1978) classic cross-section analysis focused on wage changes accompanying time spent in a new country, as did Borjas' (1985) and (1995) analyses of artificial cohorts. Other work (e.g., Antecol *et al*, 2006) has expanded the examination of the outcomes of the process of assimilation to focus on both prices (wage rates) and quantities (employment levels). Substantial work has also focused on employment of immigrants (see the summary in Ribar, 2012). These outcomes are the indicators of immigrants' well-being, and they provide signals to potential immigrants (and emigrants); but they tell us nothing about what immigrants are doing in the **process** of assimilation itself.

Here we step back from this black-box approach to assimilation and focus instead on the process of assimilation—on what immigrants actually do. We develop some facts describing immigrant-native differences in the use of time; based on these facts, we derive an economic

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theory of assimilation that has specific testable predictions about the behavior of immigrants compared to natives. We test these predictions on a large recently created American data set, the American Time Use Survey. After having examined these hypotheses we consider the sources of heterogeneity in immigrants' outcomes. Finally, we replicate the results on an Australian data set.

Although one recent study (Vargas and Chavez, 2009) has examined immigrants' time use and two others (Zaiceva and Zimmermann, 2007, 2011) have analyzed time use by ethnicity, our focus on assimilation as a process is novel for economists. But although new to economics, viewing assimilation this way has occupied historians and others for a very long time.[1] Handlin's (1951) classic discussion framed the "immigrant experience" as one of becoming rather than being, with assimilation viewed as a learning process:

> Working as they did in a new fashion and in a strange place, it took time to find a way around, to begin to learn the operations of the productive system of which they had become a part. (Handlin, p. 65)

## 2 Some Initial Impressions

Since 2003 the U.S. has developed the world's largest continuing data set based on time diaries, the American Time Use Survey (ATUS), which samples respondents from households that had recently left the Current Population Survey (CPS) sample. We use data from 2004–2008, containing diaries provided through next-day recall by nearly 65,000 individuals ages 15 and up, each for the one day prior to the morning on which they completed the diary (see Hamermesh *et al*, 2005). Each person keeps a diary for only that one day, thus preventing us from looking at anything other than snapshot differences between immigrants and natives. There are 55,949 natives in the sample and 8,976 immigrants. With the appropriate weights (accounting for the underlying sample mix, sample non-response, and the days covered by the diaries) we obtain a complete picture of what the representative American, immigrant or native, was doing on a representative day during these five years.

The ATUS' restriction to one household member prevents us from examining within-family behavior, and the restriction to one diary-day per person rules out consideration of differences in habitual or long-run behavior between immigrants and natives. The data set does, however, provide a sufficiently large sample of immigrants and enough additional information about them to enable us both to draw conclusions about immigrant-native differences and to examine the underlying causes of any implied differences in the costs of assimilation.[2]

The ATUS classifies activities into over 400 separate categories, with the biggest three—sleeping, paid employment, and watching television—accounting for over 60 percent of total time. Most activities are not engaged in by most respondents: The representative native averages 24.5 separate activities each day, as does the representative immigrant. This preponderance of zeroes means we cannot concentrate on a small set of primitive categories, since immigrant-native differences in participation in the activity would be tiny. We focus instead on ten aggregates of activities: Purchasing, education, market work, care for others,

[1]The role of learning and time use in assimilation has been recognized in song: Leonard Bernstein, *Candide*, "I am so easily assimilated, …, It's easy, it's ever so easy! Do like the natives do."

[2]While all the results reflect population-based sampling weights in the ATUS, one might be concerned about unit non-response. It is true (Abraham *et al*, 2006) that in terms of observables this is not a problem in the ATUS, but perhaps the sample is non-representative along non-observable dimensions. We obviously cannot account for this potential difficulty; but, if it exists, one would think that those immigrants who, other things equal, are less likely to have completed time diaries are those who are most different from natives. That being the case, the results here will understate the true immigrant-native differences.

eating/drinking, household activities (household production), personal care, other leisure, socializing/television watching, and organizational/civic/religious activities. For the first three of these aggregates, the three that we examine in most detail, the Appendix lists the sub-aggregates (many of which are themselves aggregated from the primitive categories) that comprise them, along with the average amounts of time in the most common sub-aggregates.[3]

In creating these aggregates we recognize that the task of classification is essentially arbitrary. For example, sleeping is clearly personal care; but is going to church a religious activity or socializing? Should eating/drinking be a separate category, or is some of it more properly included in work, as in a business lunch, or in socializing, as with a dinner with friends? In the end, as with the use of any accounting data, we are thrown back on the choices about classification made by the producers of the data.

Consider the raw differences in patterns of time use between immigrants and natives. The first row for each of the ten categories in Table 1 presents the mean amount of time in the activity by the average immigrant (native). Looking at these unconditional means suggests that there is no difference in time spent in many activities by immigrants and natives. The mean amounts of time spent in purchasing and education, for example, are nearly identical; and there appears to be no particular pattern in the other differences.[4]

The second and third rows of each part of the table present the fractions of sample members engaged in the activity (its incidence) and the conditional means of time spent on it by those engaging in the activity (its intensity). These patterns reveal a richer picture of immigrant-native differences. Consider, for example the purchasing category: The unconditional means are equal. Immigrants are less likely to undertake the activity, but their intensity in it exceeds that of natives. On the other hand, the unconditional time spent in organizational activities is greater among natives, but that is entirely due to their greater incidence of this activity—the intensities are the same. In these activities the distinctions are clear, but even in others the table demonstrates the need to go beyond comparing unconditional means.

## 3 Theoretical Motivation

We construct a theory of assimilation that highlights the distinction between incidence and intensity of time use. Assimilation is an investment process—the immigrant does things that natives do not need to do in order to learn more about the new country and “fit in better” in the future. To capture this process parsimoniously, let there be two time periods, t = 1 and 2, and two types of individuals, natives (N) and immigrants (F). Some of the things that an immigrant does aid assimilation. Taking a course in English, dealing with the transportation system, working outside the ethnic enclave, and shopping in non-ethnic stores all increase the immigrant’s familiarity with the new society. Conversely, other activities, particularly those performed at home, and those that involve dealing with other immigrants of the same background, are not assimilating.

Let there be two types of activity, assimilating activities, a, and other activities, a fraction 1-a, together making up the total amount of time available, set equal to 1 for convenience.

[3]One might be concerned that these activities include travel time. To exclude travel time would exclude something that is clearly endogenous. Nonetheless, we re-estimated the basic models reported in this study with travel time excluded, a re-specification whose results altered none of our conclusions qualitatively.

[4]The time diary method requires total times to exhaust the day—1440 minutes. Because a few categories could not, however, be coded, the sums of these averages do not quite exhaust the total: Among immigrants they total 1422 minutes, among natives 1419 minutes.

Assimilating activities require overcoming the language and cultural hurdles of getting out into the native world. The Foreigner's maximization problem is:

$$\text{Max } \{U(a_1, 1 - a_1) - CI(a_1) + RF(a_1)U(a_2, 1 - a_2)\}, \quad (1)$$

where $0 < U_1(a_t, 1- a_t), U_2(a_t, 1- a_t) < \infty$ for $0 \leq a_t \leq 1$; $U_{11}, U_{22} < 0$. R is the discount factor, $0 < R < 1$. The gain to engaging in the assimilating activity is increased utility in the future, with the magnitude of the gain depending upon the function F, $F(0)>0$, $F'>0$, $F''<0$. $I(\cdot)$ is an indicator function equaling 1 if $a_1 > 0$, 0 if $a_1 = 0$; and each immigrant incurs the lumpy cost C of choosing to overcome the hurdles (language, foreignness, etc.) of undertaking the assimilating activity.

The parameter C varies across immigrants—some find it easier than others to leave the comfort of their familiar culture and take part in activities that are foreign to them. We have assumed that the costs of participating in the assimilating activity are independent of the amount of the activity that is undertaken. This is probably a simplification—some of these costs no doubt are also variable, rising as the amount of the assimilating activity increases. Nonetheless, so long as some part of the cost is fixed, the predictions of the model are valid; and the presence of variable costs adds no other testable predictions.

Maximization by the immigrant in Period 1 yields:

$$U_1(a^*_1, 1-a^*_1) - U_2(a^*_1, 1-a^*_1) = -RF'(a^*_1)U(a_2, 1-a_2), \text{if } a^*_1>0, \text{ with } a^*_1>0 \text{ if:} \quad (2a)$$

$$[U(a^*_1, 1 - a^*_1) - U(0, 1)] + R[F(a^*_1) - F(0)]U(a_2, 1 - a_2) > C. \quad (2b)$$

Now consider maximization by the native. We assume that the native's costs of undertaking the assimilating activity are identically zero—$C \equiv 0$, and that there are no gains to assimilation— $F(a_1) \equiv 1$ for all $a_1 \geq 0$. The native has, by definition, already assimilated, so that the fixed costs are always greater for the immigrant. The utility-maximizing choice of activity in Period 2 is identical for both natives and immigrants—all that differs, assuming that U is the same for both, is the fillip to utility generated by the fact that $F(a^*_1) <1$ for immigrants. Given the shape of U, in this simplified model the native will always undertake some of both the assimilating activity and the other activity; and the right-hand side of (2a) will be identically zero among natives (because $F'(a_1) \equiv 0$ for them).

We can thus focus on differences in outcomes in Period 1 between natives and immigrants. Recognizing that C is a random variable, rewrite the equation describing the immigrant's decision about undertaking the assimilating activity as:

$$\Pr\{a^*_1>0\} = \Pr\{C<[U(a^*_1, 1-a^*_1) - U(0, 1)] + R[F(a^*_1) - F(0)]U(a_2, 1-a_2)\}, \quad (2b')$$

and remember that this probability is identically one for natives. Comparing (2a) between immigrants and natives, whatever the maximizing choice of $a^*_1$ is for natives, the negative term on the right-side for immigrants means that, if they choose to undertake any of the assimilating activity, the amount chosen will exceed that undertaken by natives.

The model yields two major predictions:

1. The assimilating activity is less likely to be undertaken by immigrants than by natives. That is more likely to be true if the costs of assimilation C are higher, the gains to assimilation, $F(a_1) - F(0)$, are lower, and the immigrant has a shorter horizon (lower R).

**2** Conditional on both engaging in the assimilating activity, the immigrant will choose a higher $a^*_1$ than the native.

In addition to these two broad implications about immigrants in comparison to natives, one can go further and proxy some of the parameters to consider how outcomes will change with variation in immigrants' characteristics, linking those characteristics to C. Thus:

**3** Immigrants who have been in the new country longer will be more native-like, as will those from countries that are more similar to the U.S. Their probability of engaging in assimilating activities will approach that of natives, and, conditional on engaging in these activities, the amount they undertake will approach that of natives (and be less than that of more recent immigrants who choose to engage in the activities).

**4** Older immigrants, conditional on the time they have lived in the new country, will have a lower probability of engaging in the assimilating activity, because for them Period 2 is shorter.

The model outlined above describes "long-term" behavior, with an immigrant's lifetime in the destination country partitioned into two broad stretches of time, an initial period in which assimilation takes place (Period 1), and a subsequent period in which no further assimilation occurs (Period 2). In this context, choosing not to engage in the assimilating activity (i.e., $a^*_1 = 0$) represents a decision *never* to engage in this activity during the years (or perhaps even decades) of the initial assimilation period. Long-term non-participation along these lines might make sense for two of the assimilating activities we study below: education and work. The other major assimilating activity that we study, however, is purchasing, and it difficult to believe that an immigrant would never shop over an extended period. Moreover, the data we analyze provide time-use information only for a single, randomly chosen day for each individual in the sample. Non-participation in these data does not necessarily represent the long-term concept described by the preceding model. Rather, it represents the short-term decision to forgo the assimilating activity on the survey day and perhaps undertake it on other nearby days.

To provide a closer link between our theory of assimilation and the empirical analysis to follow, consider an immigrant for whom the long-term utility maximization problem outlined above implies an optimal choice of $a^*_1 > 0$ for the amount of assimilating activity undertaken during the initial assimilation period. The immigrant must now choose how to allocate this aggregate amount of time across the shorter time periods (e.g., days) that make up the longer assimilation period and that we observe in the data.[5] Let $a_{1d}$ represent the time allocated to the assimilating activity on day d of the D days that make up the assimilation period. We can then write the immigrant's short-term time allocation problem as choosing the $a_{1d}$ to:

$$\text{Max } \{\sum_{d=1}^{D} \quad u(a_{1d}, 1 - a_{1d}) - cI(a_{1d})\}, \text{ s.t.} \sum_{d=1}^{D} a_{1d} = a^*_1. \quad (3)$$

Here, $u(\cdot,\cdot)$ is a daily utility function, c represents the fixed cost of engaging in the assimilating activity on a particular day, and $I(\cdot)$ is an indicator function for $a_{1d} > 0$.[6] If the fixed costs c were zero, concavity of the utility function would yield an optimal solution of spending the same time on the assimilating activity every day (i.e., $a^*_{1d} = a^*_1 / D$). With sufficiently high fixed costs, however, it becomes optimal to concentrate the assimilating

[5] In the long-run problem described by equation (1), $a^*_1$ was normalized to represent the fraction of time spent on the assimilating activity in the initial period. For the short-term problem in equation (3) $a^*_1$ is renormalized to represent the total amount of time (in days) spent on the assimilating activity in the initial period.

[6] As before, for simplicity we ignore any variable costs associated with engaging in the assimilating activity.

activity on selected days and completely forgo it on others. The higher the daily fixed costs, the greater the incentive to concentrate assimilating activity on fewer days, and therefore the trade-off between incidence and intensity of time use that emerged from the long-term model reappears in its short-term counterpart. In both models, fixed costs of participation are the source of this trade-off.

Of course, both immigrants and natives are likely to face daily fixed costs of participating in various activities. These fixed costs will tend to be higher for immigrants than for natives, however, perhaps because of poor English proficiency, unfamiliarity with host country customs, and other factors that make social engagement more difficult for them. We examine all of these potential reasons in the empirical work. Moreover, fixed costs of participating in *assimilating* activities will be especially high for immigrants relative to natives, because such activities require substantial engagement with society at large, which can be more difficult and uncomfortable for immigrants. Holding constant the overall amount of time spent in such activities (i.e., holding constant $a^*_1$), the assumption of higher fixed costs for immigrants yields the prediction that they engage in assimilating activities less frequently but more intensively than natives. In other words, immigrants will undertake these activities on fewer days per week, but on the days when they do participate in themthey will spend more time on them. Similar implications pertain for comparisons among identifiable groups of immigrants expected to vary in their fixed costs of engaging in assimilating activities (i.e., because of differences in English proficiency or years in the host country).

The extension of our theoretical model to short-term time allocation decisions establishes a direct link between the model's predictions and the empirical analysis that follows, because the data refer to time use on a single day.[7] Although in some respects the long-term and short-term versions of the model have similar implications, the short-term model provides a clearer interpretation of our findings for an assimilating activity that all individuals engage in at some point. Because eventual participation in this activity is 100 percent, there is no long-term trade-off between the incidence and intensity of time allocated to it. In the short-term however, there is the possibility of doing it less frequently but for longer hours per trip. The short-term model predicts that immigrants will do this in order to mitigate their higher fixed costs of engaging with the host society.

## 4 Basic Results

To move to the empirical analysis we first need to consider what activities might be called "assimilating." The process of assimilation involves using one's available time partly to invest in learning about the native culture, economy and environment. We need to define which activities can appropriately be classified as assimilating. We arbitrarily assume that three activities—purchasing, education and market work—are included in this list, while the other activities are not and can be called non-assimilating. In the end, however, the best test of what is an assimilating activity is whether it is characterized by the one-day immigrant-native differences in behavior suggested by the theory.

For those activities that we believe to be assimilating we cannot tell whether the time spent by an immigrant in the activity eases him/her into the native world. For example, a work activity may take place in a sweatshop where the immigrant worker is surrounded by his/her fellow immigrants who speak the same language, and where s/he deals with a foreman in that same language. Alternatively, eating and drinking may occur in a workplace where the immigrant is surrounded by natives. While the ATUS does identify the location of an

[7]We thank a referee for suggesting this extension of the theoretical model.

activity and the presence of others, these identifications are only provided for some of the activities; and it is not possible to identify the immigrant status of any other people (except household members) present when the respondent engages in the activity.

While we could provide a quick informal test of the theory using the means in Table 1, a consideration of the immigration literature and the descriptive statistics (shown in the online Appendix Table 1) suggests this would be misleading. Immigrants are significantly younger than natives: While 23 percent of natives are under age 18 or over age 64, only 13 percent of immigrants are. Immigrants are much more likely than natives to be Hispanic, much less likely to be African-American, and much more likely to be married. They have many more children at home than do natives, and those children are disproportionately likely to be preschoolers. Immigrants are much less likely than natives to have gone beyond high school, and also more likely not to have completed high school; but they are more likely than natives to have advanced degrees. All these demographic differences are consistent with immigrant-native differences shown in more familiar data sources, including the U.S. Census of Population (Kritz and Gurak, 2005; Friedberg and Jaeger, 2009; Duncan and Trejo, 2012).

These demographic differences make it essential that, in testing the theory and pointing out immigrant-native differences in the incidence and conditional amounts of assimilating activities, we account for as many of them as possible. Since the essential point of the theory is that the central characteristic, immigrant status, will have opposite effects on the incidence and intensity of activities on the randomly chosen diary day, one's initial instinct of estimating a tobit model (e.g., Stewart, 2009) on these time-use data would lead one astray. Instead, the theory suggests using a double-hurdle model, of the type proposed by Cragg (1971), which involves the joint estimation of a probit on the incidence and a truncated regression on the intensity. We can test whether the impact of immigrant status on these two outcomes differs by constraining its effects to be the same and testing the constraint using the normal distribution.[8]

The top half of Table 2 shows the determinants of the incidence of the particular assimilating activities, and the aggregate of the three assimilating activities, based on probits estimated over the entire sample.[9] This table and all subsequent tables that show results describing incidence list the effects of a one-unit increase in the independent variable on the probability of the activity being undertaken. Before examining the predictions of the theory about incidence, consider the impacts of the control variables (which we present in the online Appendix Table 2). 1) Men are more likely than women to engage in the activities that we believe may be assimilating, but only because they are much more likely than women to be working for pay; 2) Those with young children are less likely to engage in these activities, both because they are less likely to work and because they are less likely to be engaged in an educational activity; 3) As has been shown for a number of countries (Gronau and Hamermesh, 2008), there is a steady increase in the probability of engaging in each of these activities with greater educational attainment.

Participation in assimilating activities overall is statistically significantly lower among immigrants, with a difference between them and natives of 1.5 percentage points (on a mean of 77 percent). This central result is driven by purchasing activities, which are far less likely to be undertaken on the single diary day provided by the ATUS by immigrants than by

[8]This is easily accomplished in STATA using the routine "craggit" created by Burke (2009). The error terms in each probit and associated truncated regression are assumed independent. Since there are different numbers of observations in the two, no test of this standard assumption is possible.

[9]Throughout the paper, we report alongside our probit estimates the popular pseudo-$R^2$ measure proposed by McFadden (1974). Veall and Zimmerman (1996) discuss a variety of such measures.

natives.[10] Educational activities are more likely to be undertaken by immigrants (a difference that disappears if we exclude homework time, which is less likely to be assimilating), while rates of market work are essentially identical between the two groups. Overall the results for the crucial variable, immigrant status, do suggest weakly that the theory describes short-run immigrant-native differences in these activities.

The bottom half of Table 2 tests the second major prediction, that, conditional on engaging in an activity on a given day, immigrants will spend more time on it. The sample sizes in these truncated regressions vary from activity to activity because the number of participants varies across activities. As with the discussion of incidence, we first examine the impacts of demographic differences (presented in the online Appendix Table 2). 1) African-Americans spend conditionally less time in the activities that may be assimilating, mainly because they spend less time in educational activities; 2) Men are more likely to spend time in these activities, entirely because, conditional on working for pay, they spend more time in the market; 3) Similarly, having more and especially younger children in the household reduces the amount of time in assimilating activities among those who participate in them; 4) Finally, the conditional amount of time in these activities rises steadily with educational attainment.

Conditional on participating in the activity on the diary day, immigrants spend more time on it in each of the three categories. The extra time immigrants spend in what we have designated as assimilating activities is not small: 10.9 percent extra in purchasing, 9.7 percent extra in education, 4.0 percent extra in market work, and 5.7 percent extra in assimilating activities in total (and hence 1.2 percent less time in other activities).[11]

For each activity the final row of Table 2 provides the normal deviate testing the cross-equation constraint that the effects of immigrant status on incidence and intensity are the same (i.e., that we could have combined the two in a standard tobit model rather than estimating separately the probit and truncated regression for each activity).[12] In each case the hypothesis of equality is strongly rejected. In its predictions about the allocation of time conditional on choosing to undertake a particular sub-aggregate of activities, time use in these activities is described fairly well by the theory. The data reject the notion that immigrant-native differences in the incidence and intensity of these activities are the same and, indeed, suggest the effects are in opposite and expected directions.[13]

These results are only suggestive: Perhaps immigrant-native differences in incidence and intensity in the other seven activities on the diary day are also respectively negative and positive, and statistically different from each other. To examine this possibility, Table 3 presents estimates of probits and truncated regressions for the impact of immigrant status in each of these activities. The final column of the table presents these estimates for the intensity in the aggregate of these seven activities, which we designate as “non-

[10]This result is driven by purchasing of goods (see the Appendix), which accounts for slightly more than half of total time in this category. Immigrant-native differences in travel time, which are arguably less likely to be assimilating, are much smaller.

[11]Although we cannot know the nativity status of an ATUS respondent’s fellow workers, it might be that those who are in blue-collar positions (CPS occupation code ≥4000) are more exposed to the native culture than other workers. Dividing the sample by this criterion, we do find that, conditional on positive work time on the diary day, and holding all the controls constant, blue-collar immigrants do work longer than blue-collar natives.

[12]A problem might arise (Stewart, 2009) with this method if those who engage in the activity on a particular day are non-randomly selected from the sub-sample that ever engages in the activity. Only a tiny fraction of people are likely to engage in educational activities during a year, and nearly everyone does some purchasing; but only part of the sample works during the year. To examine this concern we re-estimate the models for work in Table 2 including only those respondents who stated that they usually have positive work hours in a week. The results, particularly the immigrant-native differences, are essentially the same as those presented in the Table.

[13]The results look very similar when we re-estimate all equations separately for individuals younger or older than 40 years of age. The impact of immigrant status is nearly identical regardless of the age of the individual.

assimilating," (with the incidence estimates deleted since all sample members engage in at least one of these activities). In six of the seven aggregates, immigrants either have both greater (eating/drinking) or lesser (the three leisure categories) intensities and incidence than natives, or one of the two effects is not significantly nonzero. Only for household activities are the differences in incidence and intensity between immigrants and natives negative and positive, and statistically different, as they were for assimilating activities.

One might be concerned that some of the "controls" are endogenous—that choices about time use affect some of the variables that we have identified as demographic, particularly marital status, age and number of children, and perhaps educational attainment. To examine this, we re-estimated the models holding constant only the age, gender and racial/ethnic variables, with results nearly identical to those presented in Tables 2 and 3. Another possibility is that the results differ by gender in more subtle ways than is captured by inclusion of an indicator variable. Separate estimates show that immigrant-native differences in intensity and incidence (or the absence thereof for some activities) are almost identical for both men and women.[14]

A possibly more serious problem is that immigrant status is endogenous—people choose to emigrate to the U.S. based on economic incentives (e.g., Borjas, 1987). This means that our results do not reflect what would be observed if one could randomly choose members of the immigrant population. If, however, potential immigrants are rational, those who did migrate (and did not return back to their native countries) are those who expected and found the costs of assimilation to be less than those facing the average (unselected) potential migrant. This would be true whatever the immigrant's position in the earnings distributions of the home and receiving countries. That being the case, our results underestimate the immigrant-native differences that we would observe if actual immigrants were randomly selected from the set of potential immigrants.

Overall the findings accord fairly well with our theory of short-run immigrant-native differences in time use. Immigrants are less likely to engage in activities we have denoted as "assimilating," on a randomly chosen day, but conditional on doing so they spend more time on them than natives. No doubt other explanations are possible, but the findings are consistent with a theory of short-run fixed daily costs of assimilation.

## 5 The Sources of Differences in Time Use

Here we explore some possible sources of the fixed costs that underlay the results in Section 4. One obvious suspect is language knowledge, as there is substantial evidence (Chiswick and Miller, 1995; Dustmann and Fabbri, 2003; Bleakley and Chin, 2004) that knowledge of English, or at least the opportunity to learn English, affects such outcomes as immigrant-native differences in wages. Accordingly, we focus much of our attention on various measures of English-language facility (although the ATUS does not contain information on this directly).

The first measure that we use reflects the extent to which an immigrant has had time to acculturate him/herself generally to the U.S., namely the number of years since immigration. To create usefully sized cells we divide years since migration into the categories: Less than 6 years (19 percent of immigrants), 6–10 years (17 percent), 11–20 years (28 percent), and more than 20 years (36 percent). A native whose parents are immigrants may also bear substantial costs of assimilating, although for many outcomes second-generation Americans

[14]Another possibility is that immigrant-native differences differ by marital status, but that possibility too is not apparent in the data. Nor do the differences result from immigrants' much greater concentration in metropolitan areas: When rural residents are deleted, the results are nearly the same as in Tables 2 and 3, except that the immigrant-native differences in Table 2 are slightly more pronounced.

look much more like higher-order generation natives than like immigrants (Perlmann and Waldinger, 1997; Farley and Alba, 2002; Card, 2005; Burda *et al*, 2013). To examine this we define nativity variables for natives' parents, including whether both are immigrants, the father is foreign-born (and the mother is U.S.-born), or vice-versa. Nearly 10 percent of natives have at least one immigrant parent, with half of these being children of two immigrant parents and the other half split fairly evenly between children whose immigrant parent is their father or their mother.[15]

In Table 4 we substitute the indicators of years since migration for immigrant status in the probits and in the truncated regressions. We also add the indicators describing second-generation Americans. Consider first the estimates of incidence. Except for education the probit derivatives are largest and most negative for the most recent immigrant arrivals. Moreover, the effects diminish steadily in absolute size with years since migration for the aggregate of assimilating activities (and for purchasing activities).

The results for the intensities of activities are less consistent with the notion of acculturation lowering these costs. Except for purchasing activities, where the conditional amounts undertaken decrease monotonically with years since migration, there are no obvious distinctions between immigrants classified by years in the U.S.

More support is provided by the estimated impacts of second-generation status on the incidence and conditional amounts of assimilating activities. Second-generation Americans look nothing like immigrants. Indeed, if both parents were immigrants, the respondent is more likely than other natives to engage in the activities that we have classified as assimilating, although the conditional amounts they undertake do not differ from those of other natives who participate in those activities. At least in terms of short-run differences in time use, these results suggest that the process of assimilation is complete by the second generation.

As noted, a central aspect of the cost of acculturation is that of acquiring the native language. First, adopting the categorization of Bleakley and Chin (2004), we divide immigrant countries of origin into three mutually exclusive categories: 1) Those where English is the primary spoken language; 2) Those where English is not the primary spoken language but is designated as an official language; and 3) All others, where English is neither the primary spoken language nor an official language. Fully 76 percent of U.S. immigrants come from this third type of country, about one-eighth come from countries where English is an official language but not the primary spoken language (with most originating in the Indian sub-continent or the Philippines), and another eighth of U.S. immigrants hail from English-speaking countries.

A second measure of language facility is more direct but not exogenous to choices about assimilation: Whether the household's interview in the CPS was conducted in a foreign language (overwhelmingly Spanish in this sample), observed among one-third of immigrants. Given the sensitivity of some outcomes of assimilation to whether the immigrant is Mexican or not (Farley and Alba, 2002), we also include an indicator for the 21 percent of immigrants in the ATUS of Mexican origin.

The upper half of Table 5 examines the impacts of the treatment of English in the immigrant's country of origin on the probability that s/he undertakes an assimilating activity and on the conditional amount undertaken. The estimates suggest that immigrants who come

[15]Farley and Alba (2002) report similar patterns with respect to the relative size and composition of the second-generation population in the United States.

from English-speaking countries look less like other immigrants and more like natives in how they allocate time to the so-called assimilating activities. Patterns of time use are quite different, however, among those immigrants who come from countries where English is only an official language, and for the large majority of immigrants from countries where English is not an official language. These latter two groups show the predicted time use patterns relative to natives. The only surprise here is that, at least for the incidence of these activities, the negative effects are greater for those from English-official countries than those from non-English-speaking countries.

An alternative approach relies on the language in which the interview was conducted and includes the additional indicator for Mexican immigrants. The results, presented in the bottom half of Table 5, show that, conditional on their language ability, Mexican immigrants are no more likely than immigrants generally to undertake a particular assimilating activity; and conditional on that they do not perform any less of it. Weak English, however, does matter: Those immigrants whose CPS interview was not conducted in English are especially less likely to engage in assimilating activities; but conditional on doing so, they spend more time at those activities (again, with the exception being the few people involved in educational activities). These results underscore again the role of language knowledge in lowering the fixed daily costs of assimilation.[16]

While language facility, or the possibility of it, appears to be a good proxy for the fixed costs in our model, there are others. One argument is that, independent of language ability, the fixed costs of participating in assimilating activities in the United States are higher for emigrants from less developed countries with economies that are more different from the U.S. economy: “How could this man, so recently removed from an altogether different life, explain to himself the product system in which he was enmeshed?” (Handlin, 1951, pp. 78–79)

As a proxy for this idea we obtained the recent per-capita real GDP in the home country of each immigrant.[17] The average GDP per capita in the immigrants’ home countries in 2008 was $10,355 (standard deviation $14,200), with a range from $230 to $94,354. Adding this additional proxy for the costs of assimilating to the equations in Table 5 produces the estimates shown in Table 6. The inclusion of this index of development changes the estimates of the effect of emigrating from an English-speaking country, since these are highly correlated, weakening the negative impact of the latter on the incidence and intensity of these activities. The effects of GDP per capita itself are consistent with our interpreting them as reflecting lower costs of assimilation: Immigrants from countries with higher GDP are more likely than other immigrants to undertake assimilating activities on a given day (although not significantly, t=1.14) and spend significantly less time engaging in these activities, conditional on undertaking them.[18]

[16]The conclusions do not change if we interact the proxies for English-language knowledge with the individual’s educational attainment. Nor do they change if we restrict the sample to Hispanics. Re-estimating the equations in Tables 2, 3 and 5 including only the sample of Hispanics, both natives and immigrants, we find that immigrants as a group have a lower incidence of these activities than natives. Conditional on engaging in them, however, the intensity is greater. Moreover, the immigrant-native differences are entirely due to differences in language knowledge.

[17]For most of the countries of origin we use data for 2008 from the World Development Indicators of the World Bank. For a few others for which these were unavailable in that database, we obtained the information from the World Economic Outlook database of the IMF. GDP is converted to U.S. dollars using the exchange rate against the dollar.

[18]Adding interactions of home-country GDP with the language categorizations adds nothing to these equations—the effects are apparently independent. We also experimented with other proxies for cultural differences, including dominant Christian-religion or Asian. These are so highly collinear with the variables English-language background and home-country GDP per capita that we cannot draw inferences about their possible independent effects.

Another broad, but fairly weak proxy for these explanations is the extent to which other immigrants are prevalent in the area where the immigrant resides. This might lower the day-to-day costs of undertaking what we have denoted as assimilating activities. Restricting the sample to metropolitan residents, we link the data to Census 2000 information on the fraction immigrant in the metro area.[19] Adding this measure to the estimates in Table 2 does not alter the conclusions that immigrants are less likely to engage in assimilating activities but that the conditional means of their time inputs into them exceed those of natives. Either the size of the ethnic enclave does not matter, or our proxy for it is too weak to capture this possible effect.

## 6 A Replication for Australia

The theory presented above is general, so it should be applicable beyond the parochial confines of the United States. Australia is one of the few countries with large numbers of immigrants and large-scale time-diary data sets. The Australian Time Use Survey of 1992 (Australian Bureau of Statistics, 1993) included diaries completed by nearly all of the almost 7000 individuals ages 15 or over in the sampled households. The diaries were recorded in five-minute intervals on two consecutive days, with the days evenly distributed over the week. To make the analyses as similar to those for the U.S. as possible, we created control variables identical to those included in the tables above: marital status, gender, a quadratic in age, number of children and indicators of their age distribution, and educational attainment.[20] (Indicators for African-American and Hispanic are excluded for obvious reasons.) The data set also includes an indicator of whether the respondent speaks a foreign language at home, which we use to examine the sources of immigrant-native differences.

The survey recorded activities in 280 different categories. To make the test as similar to that for the U.S. as possible, we aggregated these into the same ten sets of activities. Each of these aggregates includes travel time pursuant to the basic activity. The basic activities included in purchasing and market work are very similar to those in the ATUS. Most of the others are too, although education/training activities encompass a somewhat different set of basic uses of time.

Immigrants account for 24 percent of the diary-days of the respondents in these data, compared to 23 percent for all Australians counted in the 1991 Census of Population and Housing.[21] Except for market work, the average (unconditional) amounts of time spent in the activities that we have shown might be viewed as assimilating look strikingly similar to the figures in Table 1: 44 (48) minutes in purchasing activities by natives (immigrants); 29 (24) minutes in schooling/training; and 200 (196) minutes in market work. The fractions of the respondents in Australia engaging in what we have classified as education/training are almost identical to those shown in Table 1. What we have classified as purchasing activities are more frequent in these data, but market work is less frequent. Among immigrants, 35 percent of the respondents state that they speak a foreign language at home, nearly identical to the fraction of immigrants in the ATUS with whom the interview was conducted in a foreign language.

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[19]We thank Brian Duncan for having supplied his tabulations from the Census 2000.

[20]We exclude the few respondents over age 85 and thus outside the age range reported in the ATUS. Also, household residents in the Australian data are recorded as children only if they are under age 15, and their categorization by age differs slightly from that in the ATUS. Finally, the categories of educational attainment necessarily differ from those in the United States. We include as low-educated respondents those with secondary or lesser qualifications; as middle-educated those with trade qualifications or a certificate or diploma; and as high-educated those with a bachelor's degree or higher. We dropped the 5 percent of respondents who were still attending school.

[21]http://www.ausstats.abs.gov.au/ausstats/free.nsf/0/4C64DE2D65803F30CA2574BF00167A44/$File/28210_1991_230_Australia_in_Profile.pdf Table 1.1.

The results for the three activities are presented in Table 7, a replication of Table 2. Each probit is based on the entire sample of 12,998 diary-days for which all the data were available, and each truncated regression is based on all the individuals who engaged in the activity. The standard errors of the estimated coefficients account for clustering of the observations.[22] For each of the activities, the first column includes only the indicator for immigrant status, while the second adds the foreign-language indicator. All the estimated equations also contain the control variables discussed above.

The results are qualitatively identical to those for the United States. As in the U.S., the conditional amounts of time spent in the assimilating activities on the diary day are greater among immigrants than natives. Also the probability of engaging in education/training on a given day is higher among immigrants, and the probability of purchasing or doing market work is lower. Although some of the estimated parameters are statistically significant, significance is lower than in the U.S. (mainly because the samples sizes are smaller). Even the ability of the models to fit the data is similar to what we saw in Table 2. Finally, as in the U.S. data, tests of the equality of the immigrant effects on incidence and intensity reject the hypotheses for purchasing and for educational activities, although not quite for work.

The role of language in generating the outcomes is striking. (Remember, the effect of being an immigrant who speaks English at home is the coefficient on the immigrant indicator, while that for an immigrant who speaks another language at home is the sum of the two coefficients in the table.) All of the effects for immigrants are mediated through language knowledge. Only those immigrants who do not speak English at home engage in conditionally more of the assimilating activities than do natives on the diary day. English-speaking immigrants are no different from natives in the likelihood of engaging in these activities, while non-English speaking immigrants are significantly less likely to be purchasing or engaging in market work, but significantly more likely to be undertaking education/training. As with the basic results, the results on the importance of language corroborate the findings for the U.S.

An additional check is provided by the estimates of the probits and truncated regressions for the other seven categories of activities, presented in Table 8. For none of these seven do we reject the hypothesis of equal effects of immigrant status on incidence and intensity and also observe a negative effect on incidence and a positive effect on intensity with t-statistics above one. These results thus differ from what we observed for both purchasing and market work in Table 7 and look very much like what we saw in Table 3 for their American analogs.

## 7 Conclusions and Implications for Heterogeneity

Motivated by the immigrant-native differences in time use that we document here, we have derived a theory of the process of assimilation based on the notion that it is costly to assimilate. The cost is a barrier to assimilation. Some potential immigrants will not even emigrate, perceiving the barrier to be too great. Others will emigrate, but will not cross that barrier and undertake the activities that natives do, or at least not do so as often. Those immigrants who do cross the barrier have an incentive to undertake more of the assimilating activities on a given day than do natives.

Identifying a number of activities viewed as leading to assimilation, particularly education, shopping, and market work, we use the 2004–2008 American Time Use Survey to examine

[22]Among those who engaged in the same assimilating activity on both diary days, the within-person correlations of the residuals are 0.21, 0.30 and 0.32 for purchasing, education/training and work respectively.

these predictions. They are strongly supported by the data, and immigrant-native differences in other activities are not characterized by the same lower daily incidence and higher conditional intensity as these activities. While immigrants no doubt are as likely as natives to engage in most of what we have denoted as assimilating activities over the long term, their engagement is more lumpy: In the short run they are less likely to undertake the activity but perform more of it if they do it at all. This is consistent with the role of fixed daily costs in affecting behavior.

We also examine the sources of these apparent daily fixed costs of assimilation. Various proxies for them, including the immigrant's language background, suggest that language knowledge partly underlies the costs of assimilation. Higher GDP per capita in the home country also leads immigrants to behave less differently from natives, suggesting that unfamiliarity with American-style economic life also underlies those costs.

We also tested the theory on Australian data from 1992, which have the advantage of coming from a country that is nearly twice as immigrant-intensive as the U.S. While the survey instrument defines activities slightly differently from the U.S. data, the Australian results look very similar to those for the U.S. In both countries, language plays an important role in time use assimilation by immigrants.

Our view of the process of assimilation and the demonstration of its validity with time-use data suggest a testable implication for the commonly-examined outcomes of the assimilation process. Some immigrants will assimilate well, while others will not—our short-run results would extend to the long run for some immigrants. While much of the research on assimilation outcomes has focused on the time path of **average** immigrant-native differences, the heterogeneity implied here suggests that the cross-section variance of immigrants' earnings and hours will exceed that of natives. This should be true for immigrants as a group, but also for immigrants who are otherwise observably the same as natives, since unobservable factors will leave some residual heterogeneity. The same implications could be tested on such outcomes as wages/earnings, labor-force participation, and hours of work.

In terms of policy, the results suggest a critical need to encourage immigrants to undertake assimilating activities—to overcome the short-run costs of assimilation. As we have shown, these costs involve familiarity with language and economy, and no doubt other aspects of life as well. Requirements of and subsidized immersion into the language and culture, perhaps like the Israeli *ulpanim*, are one possibility.[23]

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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# Appendix

Categorization of time-use activities (minutes/day), ATUS 2004–2008

| Type of Activity | | | |
|---|---|---|---|
| **Purchasing (47.6)** | **Education (27.6)** | **Work (223.8)** | **Other (1120.3)** |
| Consumer goods (23.9) | Attending class (16.6) | Working (203.2) | Care (46.1) |
| Grocery shopping | Homework and research (8.7) | Work-related activities | Eating and drinking (74.2) |
| Financial services | Travel for education | Other income-generating activities | Household activities (109.7) |
| Medical services | | Job search and interviewing | Personal care (562.7) |
| Personal care services | | Travel for work | Other leisure (33.9) |
| Household services | | | Socializing and television (274.4) |
| Home repair services | | | Organizational/civic/ religious (19.3) |
| Vehicle repair | | | |
| Government services | | | |
| Travel for purchasing (17.4) | | | |

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**Table 1**

Descriptive statistics on time use, immigrants and natives, ATUS 2004–08, mean, incidence and conditional mean, and standard error of mean[a]

| | Immigrants | Natives | | Immigrants | Natives |
|---|---|---|---|---|---|
| **Purchasing** | 47.41 | 47.67 | **Household activities** | 115.69 | 108.71 |
| | (0.88) | (0.35) | | (1.51) | (0.57) |
| Yes? | 0.402 | 0.461 | Yes? | 0.718 | 0.766 |
| Minutes/day | 117.89 | 103.48 | Minutes/day | 161.22 | 141.86 |
| | (1.50) | (0.58) | | (1.76) | (0.66) |
| **Education** | 26.44 | 27.80 | **Personal care** | 576.85 | 560.32 |
| | (1.16) | (0.46) | | (1.49) | (0.61) |
| Yes? | 0.079 | 0.086 | Yes? | 0.999 | 0.999 |
| Minutes/day | 333.87 | 323.02 | Minutes/day | 576.95 | 560.48 |
| | (9.61) | (3.31) | | (1.48) | (0.61) |
| **Work** | 249.79 | 219.48 | **Other leisure** | 26.50 | 35.10 |
| | (3.00) | (1.16) | | (0.65) | (0.33) |
| Yes? | 0.492 | 0.461 | Yes? | 0.355 | 0.434 |
| Minutes/day | 507.70 | 475.31 | Minutes/day | 74.55 | 80.80 |
| | 3.07) | (1.40) | | (1.47) | (0.65) |
| **Care** | 51.31 | 45.23 | **Socializing/Television** | 237.54 | 280.51 |
| | (1.07) | (0.41) | | (1.92) | (0.86) |
| Yes? | 0.387 | 0.359 | Yes? | 0.936 | 0.956 |
| Minutes/day | 132.64 | 125.82 | Minutes/day | 253.77 | 293.29 |
| | (2.08) | (0.83) | | (1.92) | (0.86) |
| **Eating/drinking** | 73.98 | 74.25 | **Organizational/civic/religious** | 16.66 | 19.72 |
| | (0.60) | (0.26) | | (0.64) | (0.28) |
| Yes? | 0.976 | 0.961 | Yes? | 0.119 | 0.142 |
| Minutes/day | 75.83 | 77.28 | Minutes/day | 139.56 | 139.04 |
| | (0.61) | (0.26) | | (3.18) | (1.24) |
| N = | 8,976 | 55,949 | | | |

Standard errors of means, here and in the online Appendix Table 1.

[a]All of the statistics here are weighted to reflect the behavior of a representative American on a representative day using the variable wt06, based on the ATUS methodology for 2006.

## Table 2

Marginal impacts of immigrant status on the probability of engaging in activities and on conditional amounts of time, ATUS 2004–2008[a]

| | Probability of the Activity N=64,925 | | | |
|---|---|---|---|---|
| **Activity:** | **Purchasing** | **Education** | **Work** | **Assimilating** |
| **Variable:** | | | | |
| Immigrant | −0.0519 | 0.0082 | 0.0015 | −0.0153 |
| | (0.0088) | (0.0039) | (0.0092) | (0.0072) |
| Pseudo-$R^2$ | 0.0180 | 0.2741 | 0.1333 | 0.0796 |
| | **Conditional Amount of the Activity** | | | |
| Immigrant | 11.449 | 31.492 | 19.319 | 22.113 |
| | (1.834) | (9.042) | (4.058) | (3.563) |
| Adjusted-$R^2$ | 0.0225 | 0.1511 | 0.0561 | 0.1095 |
| N = | 30442 | 4195 | 25304 | 46730 |
| Z score of equality of immigrant effects on probability and conditional amount: | | | | |
| | 6.09 | 3.37 | 5.69 | 4.85 |

[*] Standard errors of the estimated coefficients here and in Tables 3–8. This table and Tables 3–6 include all the controls in the online Appendix Table 2.

## Table 3

Marginal impacts of immigrant status on the probability of engaging in activities and the conditional amounts, ATUS 2004–2008

| | Care | Eating/ drinking | Household activities | Personal care |
|---|---|---|---|---|
| **Outcome:** | | | | |
| Probability of engaging in the activity | −0.0718 | 0.0119 | −0.0400 | −0.00001 |
| | (0.0088) | (0.0030) | (0.0081) | (0.0001) |
| Conditional amount | 3.320 | 2.581 | 14.119 | 14.790 |
| | (3.316) | (0.966) | (2.574) | (2.514) |
| Z-score of equality | 0.82 | 5.63 | 4.98 | 6.24 |
| N (in truncated regressions) = | 26,265 | 62,505 | 51,356 | 64,901 |
| | **Other leisure** | **Socializing/ television** | **Organization/ Civic/religious** | **Non-assimilating** |
| Probability of engaging in the activity | −0.0581 | −0.0156 | −0.0105 | |
| | (0.0086) | (0.0042) | (0.0054) | |
| Conditional amount | −6.885 | −17.732 | −7.660 | −14.056 |
| | (2.347) | (3.094) | (5.146) | (3.310) |
| Z score of equality | 3.87 | 7.14 | 1.95 | |
| N (in truncated regressions) = | 28,082 | 62,085 | 11,142 | 64,925 |

**Table 4**

Impacts of years since migration and generational status on the probability and conditional amount of an activity, ATUS 2004–2008

| | Purchasing | Education | Work | Assimilating | Not-assimilating |
|---|---|---|---|---|---|
| **Variable:** | | | | | |
| | | **Probability of the Activity (N=64,925)** | | | |
| **Immigrants in U.S.:** | | | | | |
| <6 years | −0.0868 | 0.0263 | −0.0300 | −0.0351 | |
| | (0.0175) | (0.0086) | (0.0187) | (0.0160) | |
| 6–10 years | −0.0500 | 0.0078 | −0.0117 | −0.0214 | |
| | (0.0193) | (0.0080) | (0.0187) | (0.0152) | |
| 11–20 years | −0.0441 | 0.0103 | 0.0133 | −0.0078 | |
| | (0.0148) | (0.0069) | (0.0151) | (0.0120) | |
| >20 years | −0.0269 | −0.00002 | 0.0008 | 0.0062 | |
| | (0.0121) | (0.0054) | (0.0131) | (0.0099) | |
| **Second generation** | | | | | |
| Both | 0.0361 | 0.0117 | −0.0319 | 0.0403 | |
| | (0.0142) | (0.0057) | (0.0156) | (0.0102) | |
| Father only | 0.0050 | 0.0131 | −0.0071 | 0.0084 | |
| | (0.0181) | (0.0098) | (0.0202) | (0.0135) | |
| Mother only | 0.0244 | 0.0188 | −0.0314 | 0.0224 | |
| | (0.0201) | (0.0098) | (0.0204) | (0.0149) | |
| Pseudo-$R^2$ | 0.0183 | 0.2751 | 0.1335 | 0.0802 | |
| | | **Minutes** | **Conditional on the Activity** | | |
| **In U.S.:** | | | | | |
| <6 years | 20.232 | 22.949 | 20.390 | 18.099 | −6.790 |
| | (3.864) | (14.013) | (7.947) | (6.980) | (6.495) |
| 6–10 years | 15.891 | 38.552 | 16.904 | 20.771 | −13.898 |
| | (3.974) | (18.461) | (8.325) | (7.449) | (6.921) |
| 11–20 years | 10.370 | 69.096 | 17.545 | 31.546 | −25.298 |
| | (3.124) | (15.169) | (6.517) | (5.911) | (5.518) |
| >20 years | 8.617 | −35.264 | 21.133 | 16.877 | −13.734 |
| | (2.648) | (24.345) | (6.070) | (5.329) | (4.826) |

| | Purchasing | Education | Work | Assimilating | Not-assimilating |
|---|---|---|---|---|---|
| **Parents Immigrants:** | | | | | |
| Both | 7.822 | 20.978 | −4.385 | −1.947 | −9.628 |
| | (2.746) | (12.023) | (7.323) | (5.663) | (5.169) |
| Father | −4.385 | −7.624 | −0.112 | −2.309 | 0.746 |
| | (3.737) | (19.0308) | (9.927) | (7.769) | (6.982) |
| Mother | −3.747 | −13.335 | 15.741 | 0.469 | −8.595 |
| | (4.039) | (18.676) | (9.927) | (8.279) | (7.728) |
| Adjusted-$R^2$ | 0.0230 | 0.1538 | 0.0560 | 0.1095 | 0.1305 |
| N = | 30,442 | 4,195 | 25,304 | 46,730 | 64,924 |

**Table 5**

Impacts of English in home country on the probability and conditional amount of an activity, ATUS 2004–2008

| | Purchasing | Education | Work | Assimilating | Not-assimilating |
|---|---|---|---|---|---|
| **Variable:** | | | | | |
| | | | **Probability of the Activity (N=64925)** | | |
| English | 0.0033 | 0.0091 | 0.0004 | 0.0149 | |
| | (0.0204) | (0.0095) | (0.0211) | (0.0151) | |
| Official | −0.0800 | 0.0133 | −0.0523 | −0.0572 | |
| English | (0.0189) | (0.0091) | (0.0196) | (0.0185) | |
| No English | −0.0560 | 0.0070 | 0.0149 | −0.0122 | |
| | (0.0103) | (0.0046) | (0.0108) | (0.0083) | |
| Pseudo-$R^2$ | 0.0181 | 0.2741 | 0.1335 | 0.0798 | |
| | | | **Minutes Conditional on the Activity** | | |
| English | 9.510 | 35.238 | 13.857 | 17.234 | −20.760 |
| | (4.255) | (25.358) | (10.028) | (8.683) | (7.991) |
| Official | 14.821 | 26.015 | 18.192 | 13.021 | 5.614 |
| English | (4.281) | (20.698) | (9.107) | (8.143) | (7.475) |
| No English | 11.129 | 32.225 | 20.626 | 25.222 | −17.438 |
| | (2.153) | (10.385) | (4.706) | (4.136) | (3.846) |
| Adjusted-$R^2$ | 0.0230 | 0.1507 | 0.0560 | 0.1095 | 0.1305 |
| N = | 30,442 | 4,195 | 25,304 | 46,730 | 64,924 |
| | | | **Probability of the Activity (N=37914)** | | |
| Immigrant | −0.0272 | 0.0148 | −0.0032 | −0.0046 | |
| | (0.0124) | (0.0056) | (0.0128) | (0.0100) | |
| Mexican | 0.0124 | −0.0044 | −0.0217 | −0.0135 | |
| immigrant | (0.0274) | (0.0089) | (0.0278) | (0.0225) | |
| Interview | −0.0786 | −0.0207 | 0.0564 | −0.0307 | |
| Not-English | (0.0200) | (0.0073) | (0.0209) | (0.0163) | |
| Pseudo-$R^2$ | 0.0188 | 0.2972 | 0.1329 | 0.0830 | |
| | | | **Minutes Conditional on the Activity** | | |
| Immigrant | 5.376 | 29.075 | 13.227 | 17.057 | −13.323 |

| | Purchasing | Education | Work | Assimilating | Not-assimilating |
|---|---|---|---|---|---|
| | (2.512) | (12.800) | (5.568) | (4.945) | (4.600) |
| Mexican | 2.068 | −31.894 | 11.146 | −4.726 | 8.971 |
| immigrant | (6.501) | (37.691) | (13.427) | (12.042) | (10.852) |
| Interview | 19.030 | −35.403 | 27.143 | 25.633 | −10.064 |
| Not-English | (4.554) | (22.342) | (9.413) | (8.349) | (7.503) |
| Adjusted-$R^2$ | 0.0230 | 0.1420 | 0.0572 | 0.1066 | 0.1314 |
| N = | 17,617 | 2,357 | 14,924 | 27,243 | 37,913 |

**Table 6**

Impacts of home-country GDP per capita on the probability and conditional amount of an activity, ATUS 2004–2008

| | Purchasing | Education | Work | Assimilating | Not-assimilating |
|---|---|---|---|---|---|
| **Variable:** | | **Probability of the Activity (N=64925)** | | | |
| GDP/Capita | 0.0153 | −0.0016 | −0.0099 | 0.0049 | |
| ($10,000) | (0.0052) | (0.0021) | (0.0058) | (0.0043) | |
| English | −0.0369 | 0.0139 | 0.0259 | 0.0025 | |
| | (0.0250) | (0.0123) | (0.0266) | (0.0192) | |
| Official | −0.0890 | 0.0144 | −0.0465 | −0.0609 | |
| English | (0.0190) | (0.0094) | (0.0200) | (0.0189) | |
| No English | −0.0727 | −0.0087 | 0.0257 | −0.0178 | |
| | (0.0121) | (0.0055) | (0.0127) | (0.0099) | |
| Pseudo-$R^2$ | 0.0183 | 0.2742 | 0.1336 | 0.0799 | |
| | | **Minutes** | **Conditional on the Activity** | | |
| GDP/Capita | −1.269 | 5.799 | −6.904 | −8.654 | 6.724 |
| ($10,000) | (1.136) | (6.700) | (2.634) | (2.268) | (2.077) |
| English | 13.139 | 48.889 | 31.129 | 40.271 | −38.452 |
| | (5.354) | (29.862) | (11.997) | (10.574) | (9.680) |
| Official | 15.678 | 28.314 | 21.878 | 18.025 | 1.454 |
| English | (4.349) | (20.868) | (9.214) | (8.247) | (7.584) |
| No English | 12.614 | 37.046 | 27.990 | 34.701 | −24.912 |
| | (2.530) | (11.784) | (5.480) | (4.824) | (4.485) |
| Adjusted-$R^2$ | 0.0225 | 0.1507 | 0.0490 | 0.1098 | 0.1307 |
| N = | 30,442 | 4,195 | 25,304 | 46,730 | 64,924 |

**Table 7**

Impacts of immigrant status and English-language knowledge home-country on the probability and conditional amount of an activity, Australian Time Use Survey, 1992[a]

| | Purchasing | | Education/ Training | | Work | |
|---|---|---|---|---|---|---|
| **Probability of the Activity (No. Days = 12,998; No. People = 6,618)** | | | | | | |
| **Variable:** | | | | | | |
| Immigrant | −0.0140 | 0.0170 | 0.0089 | 0.0011 | −0.0320 | −0.0025 |
| | (0.0114) | (0.0128) | (0.0053) | (0.0054) | (0.0129) | (0.0146) |
| Foreign | -------- | −0.0953 | --------- | 0.0257 | --------- | −0.0895 |
| language | -------- | (0.0175) | --------- | (0.0093) | --------- | (0.0191) |
| Pseudo-$R^2$ | 0.0202 | 0.0221 | 0.2568 | 0.2588 | 0.1489 | 0.1506 |
| **Minutes Conditional on the Activity** | | | | | | |
| Immigrant | 6.940 | 3.690 | 41.162 | 15.688 | 9.339 | 3.906 |
| | (2.375) | (2.651) | (21.215) | (22.966) | (8.183) | (8.781) |
| Foreign | --------- | 11.427 | --------- | 65.200 | --------- | 20.667 |
| language | --------- | (3.723) | --------- | (28.631) | --------- | (13.446) |
| Adjusted-$R^2$ | 0.0254 | 0.0266 | 0.1504 | 0.1576 | 0.0987 | 0.0992 |
| NDAYS | 6,764 | | 1,048 | | 5,607 | |
| N People | 4,714 | | 703 | | 3,580 | |
| Z score of equality | 2.52 | | 2.65 | | 1.30 | |

[a] Also included in the equations are a vector of indicators of educational attainment, a quadratic in the respondent's age, gender, marital status, the number of children under age 15, and their distribution by age category. Standard errors are clustered on the individuals.

## Table 8

Impacts of immigrant status on the probability and conditional amount of an activity, Australian Time Use Survey, 1992, N days =12,998[a]

| | Care | Eating/ drinking | Household activities | Personal care |
|---|---|---|---|---|
| **Outcome:** | | | | |
| Probability of engaging in the activity | −0.0149 | −0.0031 | −0.0064 | 0.0013 |
| | (0.0128) | (0.0047) | (0.0080) | (0.0006) |
| Conditional amount | 6.661 | 3.071 | 0.538 | 3.566 |
| | (4.786) | (1.169) | (3.260) | (3.045) |
| Z-score of equality | 1.05 | 3.17 | 1.36 | 0.22 |
| N = | 3,676 | 12,394 | 11,253 | 12,970 |
| | **Other leisure** | **Socializing/ television** | **Organization/ Civic/religious** | |
| Probability of engaging in the activity | −0.0357 | −0.0008 | −0.0444 | |
| | (0.0095) | (0.0059) | (0.0096) | |
| Conditional amount | −9.861 | 16.433 | 6.088 | |
| | (4.421) | (3.516) | (7.221) | |
| Z-score of equality | 2.39 | 5.72 | ---- | |
| N = | 10,068 | 12,080 | 3,013 | |

[a] Includes all the controls in Table 7.