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ROUTINE

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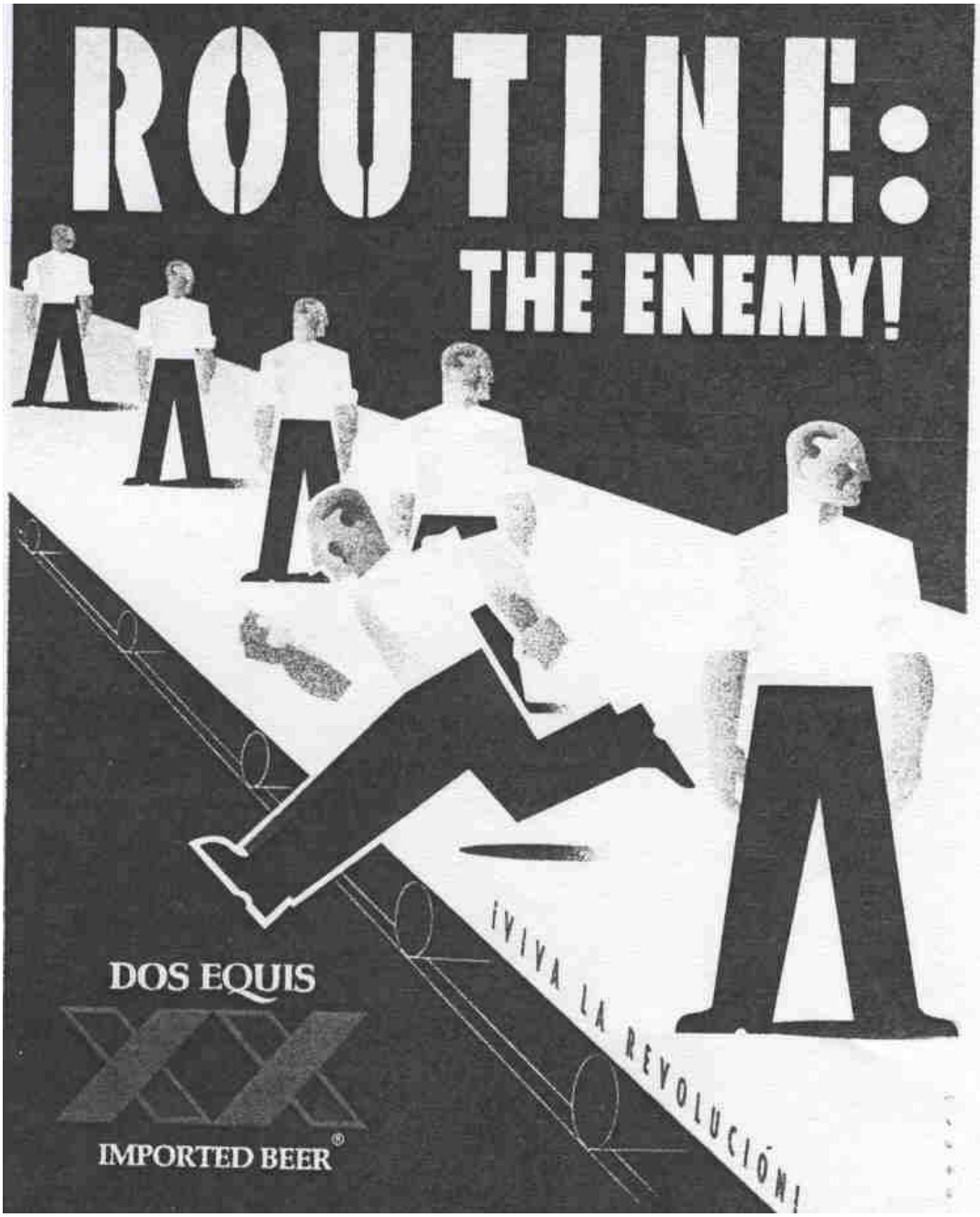
ABSTRACT

Temporal routine—maintaining the same schedule from day to day—saves time. It is also boring and inherently undesirable. As such, the amount of temporal routine a person engages in is partly an economic outcome, with differences generated by variations in the price of time, household income and the ability to generate temporal variety. Using time-budget data from Australia, Germany, the Netherlands and the United States, I show that men engage in more routine behavior than women, but only because they spend more time in (routine) market work. Other things equal, more educated people engage in less routine behavior, while higher household incomes enable people to purchase more temporal variety. Spouses' temporal routines are highly complementary. The positive income effects and impacts of schooling indicate yet another avenue by which standard measures of inequality understate total economic inequality.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I. Introduction

The unabridged dictionary defines routine as, "a customary or regular course of procedure." The notion of regularity is explicitly temporal in terms both of when an activity occurs and its repetition at that same time over several time periods. The biopsychological evidence for temporally routine behavior is immense. We know (see Moore-Ede et al, 1982) that both plant and animal organisms have natural circadian rhythms, although (absent any visual or aural cues) these are by no means naturally 24-hour rhythms for most organisms. Natural cues turn species-specific rhythms into 24-hour rhythms; and among social species the evidence suggests that individuals' actions reinforce the behavior of other members of the same species to generate more commonality among members than would arise if each operated in vacuo (Wever, 1982). Social interactions generate externalities in the timing of activities and market work (e.g., Weiss, 1996).

While biological forces and natural cues no doubt affect behavior, it is difficult to believe that these fully determine humans' day-to-day timing of their activities. Rather, "routine" over time is almost certainly an activity that involves individual choice, and as such it is an economic activity: It forces its practitioner to forego something (temporal variety) that may be desirable, and it presumably enhances utility, either directly or because it is productive (enables the worker to earn more and thus eventually consume more, or to economize on the quantity of time used in household production). As such, it should differ from one person to another depending on their different abilities and incentives to engage in temporally routine activity. It should thus be amenable to economic analysis like anything else that affects incentives to consume and produce.

As with other interpersonal differences in consumption, variations in the timing of economic activities across days affect individuals' welfare. Deducing interpersonal differences in well being simply by examining how much people consume, or even when their consumption occurs (as did Hamermesh, 1999a, in studying the timing of work), provides an incomplete picture of those differences. Economic welfare also depends on the desirability of temporal

routine/variety and on the correlations of its consumption with other components of individuals' full income. Thus examining the determinants of routine/variety contributes to a broader understanding of the distribution of economic returns.

By routine I mean temporal routine—doing the same thing in each of at least two time periods at the same time.[1] I do not explicitly address routine defined in terms of variations in the kinds of commodities produced in the household across time periods (but see Gronau and Hamermesh, 2001). The focus is exclusively on the similarities or differences in when an activity occurs during at least two different periods of time. While studies of what and how much people consume are ubiquitous, the literature on when they consume is almost nonexistent (but see the theoretical work by Winston, 1982). The empirical analysis here opens this area of study of human behavior by presenting some new tests of the role of economic incentives in individuals' use of time. It also provides evidence on how the externalities generated within a household affect the behavior of husbands and wives.

In Section II I derive a theory of the demand for temporal routine. The essence of the idea is that temporal routine is useful, in that it enables people to economize on the set-up costs of consumption and production, but that (at the margin) it is undesirable, since it restricts people's ability to enjoy temporal variety. Section III outlines the general ways in which we move from the theory to the empirical analysis of time budgets, and it presents the details of the underlying data sets. Section IV generates tests of the theory and information on demographic patterns of interpersonal differences in routine in the four countries whose time budgets I use.

II. A Model of Demand for Temporal Variety

Temporal variety is the opposite of temporal routine. It is expressed in people's behavior as engaging in a particular activity at different times on different days. I assume that consumers find temporal variety desirable at the margin, although I later examine how the results are

[1]The only study of which I am aware that even measures the extent of intertemporal similarity of activity (and that only for transport) is Rindsfüser (2001).

affected if this assumption is incorrect at least up to some margin and consumers have positive preferences for at least some temporally routine behavior. One could readily study temporal routine across days, weeks, or even years, and these are equally interesting. I concentrate on routine across days, because the available data only allow comparisons across days.

We can capture the essence of the demand for temporal variety in a model that postulates two commodities, Z^A and Z^B, and two time periods, 1 and 2, of fixed length on each of two days. The consumer's utility is determined by the amounts of these commodities that she consumes and by the temporal variety inherent in the timing of her consumption. Her utility is:

(1) $U = U(Z^A, Z^B) + R(V)$,

$U_i > 0$, $U_{ii} < 0$, and U_i Ψ 4 as Z^i Ψ 0. The Z^i are commodities that must be consumed on each day in time slot 1 or time slot 2. Both the (nonzero) amounts of the commodities and the timing of their consumption on each day are subject to choice.

The consumer's satisfaction is enhanced when she produces more of the two commodities and when the commodities are produced at different times on the two days. That temporal variety (of a fixed quantity to be consumed) is utility-enhancing is not clear a priori, although it seems reasonable: If it were not, the costs of generating variety would ensure that everyone produced each commodity at exactly the same time each day. Given these assumptions, temporal variety is completely captured in this simple model by:

(2) $V = A_{11}[1 - A_{21}]$,

where the indicator $A_{jk} = 1$ if commodity i is consumed on day j in time slot k, j, k=1,2, $A_{jk} = 0$ otherwise. V=1 if the commodities are consumed at different times on the two days, V=0 if they are consumed at the same time on the two days. I assume that $R(1) > R(0) = 0$.

Production of the commodities Z^i proceeds by the individual combining goods X^i that are purchased in the market at prices p^i and the time available in the time slot k. Since the slots are of fixed length, we ignore them here (but relax this assumption below). If the consumption of Z^i is temporally routine—is done at the same time each day—all the time in the slot can be devoted to

its production. If, however, Z^i is produced at different times on the two days (if V=1), some time that would otherwise be devoted to producing more of the commodity must instead be spent in planning/organizing the production/consumption activity. Routine is productive, in that it enables the producer/consumer to mechanize decisions about when and how to engage in each activity, thus allowing her to produce/consume more of each commodity. We can thus write household production as:

(3) $Z^i = X^i - 8_i V,\ 8_i > 0,$

where 8_i measures the commodity-specific cost of producing variety, assumed for now to be the same for all individuals.

The consumer maximizes U subject to the constraint that her entire income, wH+I, is spent on the X^i, where w is her wage, H her (fixed) daily hours of work, and I her unearned income. This yields the following maximizing conditions:

(4) $U_1(X^A - 8_A V,\ X^B - 8_B V) / U_2(X^A - 8_A V,\ X^B - 8_B V) = p_A/p_B$

with V set equal to one if:

(5) $) = R(1) - [U(X^A, X^B) - U(X^A - 8_A,\ X^B - 8_B)] > 0\ .$

Variety imposes lumpy costs on the production of commodities. The producer/consumer follows the usual criteria for allocating income between commodities, setting the marginal rate of substitution between them equal to the price ratio. She adds to this standard condition an extra consideration based on the utility derived from variety and on the relative sizes of the gains to variety and the fixed costs imposed when the commodities are not produced as part of a temporal routine.

The equilibrium is interesting only as it allows us to examine how it is affected by shocks to the exogenous variables that determine it. Since the entire budget must be spent, as wH+I increases the producer/consumer is buying more of the X^i and producing more of the Z^i. Under the assumptions about the shape of U this additional spending guarantees that above some level

of income the producer/consumer maximizes utility by setting V = 1, jumping from completely temporally routine to completely temporally variable behavior in this two-period model and perhaps discretely changing the relative production/consumption of the two commodities. At some point the bracketed term in (5) drops below R(1): The fixed costs of variety are overcome by the contribution of variety to utility. This inference leads to the empirical prediction:

P1: Higher-income people produce/consume in a less routine fashion than do otherwise identical individuals with lower incomes.

The model thus far treats the creation of variety as generating a fixed time cost independent of the amounts of the commodities that are produced. It also defines the total real time devoted to producing/consuming each commodity as fixed by technology independent of the quantities produced. We can relax those assumptions, putting the model directly into the Becker (1965) framework of producing commodities of differing relative goods intensities. This reformulation allows the costs of variety to rise with the production of the commodities.

Define utility as in (1), but now define the demands for inputs into household production as:

(6) $T^i = Z^i [t_i + 8_i V]$; $X^i = a_i Z^i$,

where t_i is the time intensity of commodity i, a_i is its goods intensity, and T^i is the total amount of time devoted to producing i each day. Here variety imposes costs that rise with the amounts of the commodities that are produced. Because the daily amount of time that is devoted to producing commodity i is now subject to choice, V can no longer be defined as in (2). Instead, we define V=1 if the specific hours used to produce commodity i on Day 1 differ from the hours devoted to its production on Day 2, and V=0 if they are identical. (This is clearly also a restrictive assumption, since one could imagine a continuum of temporal variety ranging from 1, if there is no overlap across days in the timing of producing commodity i, to 0, if the overlap is complete.)

Using the definitions of the household production technologies in (6), and assuming that individuals devote all of their time (outside of their fixed hours of work) and income to the production/consumption of the two commodities, utility in (1) is maximized when:

(4') $U_1/U_2 = \{p_A a_A + w[t_A + 8_A V]\} / \{p_B a_B + w[t_B + 8_B V]\}$

with V = 1 if:

(5') $) = R - [U(Z^A, Z^B)_{V=0} - U(Z^A, Z^B)_{V=1}] > 0$.

Under the assumptions about the U_{ii} a higher total income (wH+I) generates the same negative effect on the likelihood of routine here as in the simpler model that treated variety as imposing a fixed cost. Possibly offsetting this tendency toward less routine will be the greater opportunity cost of deviating from routine as the price of time rises, other things equal. The net effect of a higher wage rate on the demand for variety is thus ambiguous.

The discussion thus far implicitly treats hours of work as fixed on each of the two days. The choice between temporal routine and variety is exercised over the hours of the day that remain after hours of market work (which are assumed to be identical in amount and timing on both days) are completed. An expanded version of the second model would include market work as an additional, completely time-intensive commodity that, like all other commodities, rises in price (actually, generates a decline in the hourly wage) if temporal routine is abandoned for the pleasures of variety. This minor extension yields the same results for market work as for home-produced commodities. People with higher full incomes are less likely to engage in temporally routine behavior in their timing of work. The effect of higher wages for a given full income will be indeterminate because of the possibly offsetting effects of the increased demand for temporal variety and the higher time costs of temporal variety that are generated as the wage rate rises.

An interesting extension comes when we allow market work to be one of the commodities and recognize that the equilibrium wage for workers with a given set of skills is determined in the labor market by the actions of employers and workers. The evidence on

compensating wage differentials for jobs that workers report as being repetitious is mixed (Brown, 1980). If, however, we assume that workers prefer temporal variety but that the workplace is more productive if it is operated routinely, a compensating wage differential will be paid to workers on repetitive (temporally routine) jobs. Since routine is inferior, we will observe lower full-income workers seeking the temporally routine jobs that offer this pay differential. Accounting for both sides of the labor market thus reinforces the inference that routine behavior will be observed more frequently among lower full-income workers.

This discussion has proceeded as if there was a single decision-maker choosing activities and generating temporal routine/variety in order to maximize his/her satisfaction. The model generates some potentially interesting additional components if we try to apply it to the behavior of a married couple. We know that couples time their leisure together (Hamermesh, 2002; Hallberg, 2002, Ch. 3); but how does the timing of their routines interact? In a unitary household model (see Lundberg and Pollak, 1996, for a discussion of household models) the decision-maker (whose identity is undefined) would have to take into account the effect of one spouse's routine on the labor-market and non-market productivity of the other spouse. One might expect that the household technology would allow routine behavior by one spouse to reduce the cost of household production by the other spouse. A husband's routine generates a positive externality for his wife, and vice-versa. That being the case, the cost to a couple of one spouse foregoing routine for the pleasure of variety is higher than it would be for a single individual, because of the spillovers to the other spouse's time use (assuming, as the evidence suggests, that they wish to be together). Even in a collective model, in which each spouse maximizes his/her utility by striking a (cooperative or uncooperative) bargain, this externality raises the value of the bargain and makes it more likely that the couple engages in simultaneous routine behavior. This yields:

P2: The temporal routine of spouses will be complementary.

I have assumed thus far that 8_i, the cost of generating temporal variety in commodity i, is the same for each consumer/producer. This is unlikely to be the case. Just as there is evidence

(Gronau and Hamermesh, 2001) that additional human capital aids individuals in overcoming the fixed costs of increasing the numbers of commodities they produce in the household, so too should human capital enable them to overcome the set-up costs of changing their timing of consumption. This could be modeled by making V in (2) a decreasing function of the amount of human capital embodied in the producer/consumer, implying that additional skill lowers the cost of creating temporal variety, thus generating a positive correlation between human capital and temporal variety and yielding the proposition:

P3: The demand for temporal variety will rise with human capital (education).

One might reasonably object that the impact of additional human capital on the cost of temporal variety is difficult to distinguish from a positive correlation between the taste for variety and the ability to accumulate additional human capital. In the empirical sections I deal with this concern in part both by replicating the results on several different data sets and adjusting for as many observable differences as are available, recognizing that this cannot wholly distinguish between the two explanations.

This discussion has been based on the assumption that temporal routine is uniformly undesirable (that R'>0 throughout). If this assumption is incorrect, and R' is initially negative and only becomes positive after some degree of temporal routine is achieved, the predictions do not change so long as the point at which R' switches sign comes at a sufficiently low value of its argument. If R' is uniformly negative, so that people enjoy temporal routine at the margin throughout, that plus the productivity of routine mean that we will never observe people varying the timing of their production/consumption across days. That we in fact do observe diurnal variety in the timing of household production suggests that this latter possibility is inconsistent with behavior.

While I do not include routine in the kinds of activities undertaken (call it qualitative routine as opposed to temporal routine) in the formal model, one might well imagine an expanded model that includes both types of routine. In that more complex model, which would combine

the model here with that in Gronau and Hamermesh (2001), shocks would arise from the same sources as in the model in this Section—differences in the price of time, in unearned income and in human capital. While the predictions in a simple model of qualitative variety are the same as in the model presented here, it is possible that the interactions between qualitative and temporal routine are sufficiently complex that the predictions in both might change. I leave that possibility for subsequent work, assuming here the simpler model and testing in the remainder of this study whether the simple predictions of this model are borne out in a variety of data sets.

III. Testing and Data

The difficulty in implementing the theory lies in defining what we mean by temporal routine. First, we are limited by the data in the potentially usable surveys, since time budgets report on individuals' timing of consumption over at most seven days, and typically just two days. Thus the simple archetype used to derive the results in Section II is in fact fairly close to what the data permit empirically.

A second, more severe problem is that typically at least 80 different activities are coded in the time budgets. Reporting and coding errors will guarantee that temporal variety apparently exists when in fact different names may be given to the same activity. This imposes the requirement that we use a fairly high degree of aggregation of activities in order to define routine in a way that might approximate how the consumer thinks of it. Because the classification of activities differs in the various data sets I use, this also means that the extent of aggregation necessary to make the aggregates comparable across the data sets will differ.

Finally, the data require that we define routine/repetitive activity in terms of the time units over which the budgets are collected. The time units into which the days are disaggregated may be 5 or 15 minutes long. This difference too will affect the extent to which the time budgets reflect the existence of temporally routine behavior. All of these considerations dictate that the empirical work cannot be based just on one set of data. Rather, in order to obtain a believable set

of estimates of the extent and determinants of routine behavior, I base the empirical work on four sets of time budgets, those from Australia, Germany, the Netherlands and the United States.

The Australian Time Use Survey of 1992 (ABS, 1993) is a random stratified sample of roughly 7000 individuals on two days each, with only 1 percent of those who completed a diary on one day failing to provide two days of diary information. The days on which diaries were kept were typically successive, so that the hebdomadal distribution of observations is nearly uniform. Thus 4/7 of the sample kept diaries for two weekdays, and 1/7 kept diaries for two weekend days. Individuals were asked to list when they began each new activity, and their responses were then coded into 280 separate categories of activities. The activities could encompass as few as 5 minutes, with the upper bound on the length of an activity being the full 24 hours. In addition to the individuals' time diaries one person in each household responded to an interview survey detailing the household's characteristics. I use all respondents age 18-69 who completed two weekday time diaries or two weekend time diaries.

The 1991-92 German *Zeitbudgeterhebung* (Statistisches Bundesamt, 1999) covered both West and East Germany and was structured quite similarly to the Australian survey. It allowed for 230 possible activities, and it disaggregated time units into five-minute intervals. The sample is slightly larger than the Australian sample. Essentially no one failed to fill out diaries for both days. Because the survey was undertaken very shortly after the German reunification, I use only observations from the former West Germany. Both it and the Australian survey obtained information from both husbands and wives, allowing me to examine the role of intrahousehold complementarity in the demand for temporal variety. The analysis is based on all respondents age 20-69 who completed two weekday or two weekend time diaries.

The Dutch *Tijdbestedingsonderzoek* (NIWI, 1993) is a quinquennnial cross-section time-budget study that has been conducted since 1970. In this analysis I use the survey conducted in October 1990, in which 3415 individuals completed usable diaries of their activities. The survey divided respondents into two roughly equal groups, with individuals in one half-sample

completing diaries for seven consecutive days (Sunday through Saturday) in one week, and the other half-sample doing so in the next week.[2] Each individual's activities were coded into quarter-hours of the previous day. The range of possible activities encompasses 203 separate usable categories. In the Dutch data I use observations on all individuals age 18-69.

Finally, I also use the United States 1975-76 Time Use Study, which obtained four days of time diaries from 1519 households. The days were at three-month intervals, with two being weekdays, one a Saturday and the fourth a Sunday, and they were coded into 15-minute intervals. This is the only available American data set that has information on more than one diary day, and that thus allows the calculation of measures of temporal routine. Unfortunately, the sample is very old, quite small and insufficient for many of the analyses. Data for temporal routine on the weekend (the weekday data proved to have too many observations with partially missing schedules) are included mainly to provide comparisons to the results from other countries.

In order to ensure some degree of comparability across the four data sets, for each country I aggregated the basic activities into the following twelve main categories, denoted by A (activity): Market work; cleaning and cooking; family and child care; shopping; eating; sleeping; other personal activities; schooling and training; organized activities; sports and leisure; radio and television; and reading and writing. For each of the twelve activities and each of the 288 time slots t for Australia and Germany (96 for the United States) in a day, I create the indicator variable:

(7) $I_t = 1$ if $A_{Dt} = A_{D't}$, 0 otherwise,

where D and D' are the two days on which the person's activities are observed. Then for Australia and Germany I define the measure of temporal routine as:

(8) $ROUTINE = \sum I_t/288$,

[2]For half the sample the Sunday included the day when the Netherlands went off summer time. Thus for those individuals on that day there were 1500 total minutes, a difference I account for in all the following empirical work using this sample. The effect on human activity of this temporary relaxation of the time constraint is analyzed in Hamermesh (2002).

thus scaling the measure so that for each person in the samples: $1 \geq \text{ROUTINE} \geq 0$. For the United States the definition is the same, except the denominator in (8) is 96.

The Australian and German time budgets also contain information on the respondent's secondary activities in each time slot. This allows the creation of an expanded measure of routine, ROUTINE', that considers a time slot as being used routinely either if $I_t = 1$ or if the same secondary activity (among the twelve categories) is performed at time t. Since only a small fraction of time slots are coded as having a secondary activity in the Australian data this extension is unimportant there. While many of the time slots in the German data do list a secondary activity, this extension makes little difference there either.

The existence of time diaries for seven days makes computing the extent of routine for the Netherlands more difficult. There are ten pairs of weekdays for each respondent. For each pair of days D and D' I calculate:

(8') $\text{ROUTINE}_{DD'} = \sum I_t/96,$

and define:

(8") $\text{ROUTINE}_{WKDAY} = \sum \text{ROUTINE}_{DD'}/10$.

Thus for weekdays in this sample ROUTINE defines the extent of temporal routine as the average across all possible pairs of weekdays. Since there is information on both Saturday and Sunday activities for each respondent, ROUTINE on weekends is calculated as in (7) and (8) (except with 96 as the divisor). Because the Dutch time budgets contain no information on secondary activities, there is no way to calculate ROUTINE'.

Proposition P3 requires constructing a measure of human capital, which I obtain for each data set using information on the respondent's educational attainment. The information is indicated by years of schooling or by the level of schooling (and in Germany apprenticeship too) that the respondent has attained. To make the data sets comparable, for each country I divided the respondents into three educational categories, with the sizes of the low-, middle- and high-education groups varying across the samples. In each sample I inferred the appropriate

aggregations from discussions with people who were familiar with the country's educational system.[3]

The central demographic information is on marital status and numbers and ages of children. While I present summary statistics on routine for all demographic groups, the relatively small number of single persons requires that most of the analysis has to be confined to the determinants of routine by married individuals. Information on the ages of children (and even the definition of child—in the Australian data children are defined to be under age 15) is not comparable across countries. In the analysis I categorize the age of the youngest child using the definitions provided by the individual data sets, but in the discussion I refer to the categories as pre-school, pre-teen or teen.

A variety of external forces might restrict the ability to generate variety, including constraints in the product market (see Jacobsen and Kooreman, 2003) and those in the labor market. Perhaps the most important is the existence of market work that is provided on a fixed daily schedule. Since the theory does not include the presence of external constraints, a proper test of the hypotheses in Section II requires accounting for hours of market work. Accordingly, I form two measures, WORKDAY, the average hours of market work (including transportation to and from the workplace) spent on a weekday, and WORKEND, average hours of market work on a weekend day, and include these in all regressions describing ROUTINE.

To obtain measures of income effects in the demand for temporal variety we need a pure measure of income untainted by wage effects. This is, of course, difficult to obtain. As the best alternative I thus use measures of spouse's total income and estimate the demand for variety only

[3]I thank Damien Eldridge for information on Australia, John Haisken-De New for West Germany and Gerard Pfann for the Netherlands. For Australia education is low if secondary or no qualifications, middle if a certificate, diploma or trade qualified, high if a bachelor's degree. The distribution among married men (women) is: 38 (58) percent, 46 (33) percent and 16 (9) percent. For West Germany education is based on sums of years of schooling and formal training. The distribution is: 41 (47) percent, 23 (30) percent and 36 (23) percent. For the Netherlands education is low if lower general or vocational/technical, middle if middle or high general or vocational/technical, high if academic. The distribution is: 35 (42) percent, 37 (32) percent and 28 (26) percent. For the U.S. education is low if less than high school, middle if high school, high if more than high school. The distribution is 31 (26) percent, 30 (45) percent and 39 (29) percent.

for married persons. The Dutch time budgets have no usable information on spouse's income, since all the data pertain to individuals. By linking household records for married couples in the Australian and German data, however, I can construct measures of spouse's income in each. In both data sets these measures include all income accruing to the spouse—both his/her earnings and any unearned income. In addition, for couples with two working spouses, both below age 60, it seems reasonable to conclude that most of each working spouse's income consists of earnings. Thus for subsamples of the Australian and German data with both spouses under age 60 and both working in the labor market I also estimate the determinants of temporal routine including the respondent's own income divided by hours of work, a proxy for the price of his/her time. Although the measures of time prices are imperfect, including them, spouse's income and human capital endowments allows some hope of sorting out the separate effects of income, prices and household productivity on the production of and demand for temporal variety.

Table 1 presents estimates of the means and standard deviations of ROUTINE for each of the four data sets for respondents categorized by sex and marital status. Most encouragingly, the amount of temporal routine calculated in this way differs very little among Australia, the Netherlands and West Germany within each sex/marital status class. The differences in the number of underlying activities that could be coded and in the minimum duration in which they could be recorded do not appear to have generated major international differences in the calculated average outcomes. The only international difference in the means is on weekends, where there is significantly and substantially less temporal routine in the United States than in the other countries.

Note first the fraction of time at which the same activity is repeated on both days: Even on weekends, roughly half of the day is accounted for by activities (among the twelve) that are repeated intertemporally simultaneously. Also, note the importance of the constraints imposed by fixed work schedules: For each of the three countries on which we have usable weekday and weekend data, and for each sex and marital status, there is less temporally routine consumption

on the weekend (more interday variation) than on weekdays. To some extent market work regulates the degree to which we can substitute intertemporally among activities. Not surprisingly, because of their greater labor-force attachment on weekdays men have more routine schedules than women with the same marital status. On weekends, however, this difference breaks down completely: With no obligation to report to (typically fixed-schedule) workplaces, men's demand for variety differs little from that of women of the same marital status.

IV. Estimates of the Determinants of Routine

A. Results on Human Capital, Income, Time Prices and Spouses' Interactions

In much of what follows I concentrate on the data for Australia and Germany, since those data sets contain many more observations than the others and because the time intervals and activity categories are coded more finely. Table 2 thus presents the summary regressions characterizing these data sets and pooling all the available observations. In each regression here and in subsequent tables I include indicators for each day of the week to account for the possibility that the extent of routine might vary independently among pairs of days (for example, Monday-Tuesday versus Wednesday-Thursday). Perhaps the strongest (and absolutely unsurprising result) is the tremendously significant positive effect of additional hours of market work on temporal routine. Each additional hour of market work raises the fraction of the entire day that is routinized by between 0.02 to 0.04. Since each hour accounts for 0.042 of a day, this result means that each marginal hour worked might reduce temporal variety by as much as one-for-one. Alternatively, however, it implies that, while market work does generate additional routine, the fraction of a worker's day outside work that is routinized might decrease by as much as 30 minutes for each additional hour of market work each day.

One might interpret the influence of age and education in these equations as reflecting the respondents' human capital. We cannot tell from these equations (but see below) whether the effects are due to the role of higher incomes or to greater efficiency in household production (in the production of temporal variety). The estimated impacts of both sets of variables do, however,

imply that people with more human capital generate greater temporal variety.[4] While the effect of age is not significant in Australia, it is in Germany, and it implies that the extent of temporal routine diminishes until age 38 and rises thereafter. The estimated impacts of differences in educational attainment suggest that individuals in the lowest third of each country's educational distribution enjoy between 35 and 50 minutes less temporal variety each day than their compatriots in the upper third of the distribution who work the same number of hours in the labor market.

Differences in hours of market work (and the rigidities imposed by scheduled hours of market work) and human capital account for most of the demographic differences that appeared in the means in Table 1. The coefficients on the demographic variables in Table 2 are typically insignificantly different from zero and imply that having additional children, or having pre-school children, does little to alter the extent of temporal routine. Differences by sex and marital status also disappear once we account for market activities and human capital.

Table 3 presents estimates like those in Table 2, but for weekday and weekend routine separately and for the Netherlands and the United States as well as for Australia and West Germany. While there are some differences in the coefficients between weekdays and weekends, the central results in Table 2 are duplicated for both types of days. Except for Australia, the human capital measures look quite similar (although, because the sample sizes for weekends especially are smaller, these estimates are less significant statistically) on weekends as on weekdays. Individuals with more human capital generate more temporal variety on weekends than those with less education or who are at the extremes of the ages in the samples (18 and 69). Since market work is rare on weekends (except in the U. S.), so that the price of time is unlikely to be a major issue, the presence of educational differences in the extent of temporal routine on weekends suggests the importance of the role of human capital in reducing the λ_i in equation (3).

[4]The effect shown in the table is net of the impact of educational attainment on market work. If we exclude hours of market work from the equations, however, the gross effects of education remain positive and are generally significant statistically.

The conclusion that much, but perhaps not all of an extra hour of market work increases the extent of temporal routine is consistent with the results for weekdays for each of the three samples. Similarly, the presence of additional children has little effect on temporal routine either on weekdays or weekends; but having pre-school children increases the amount of variety experienced over a pair of weekend days, although it has no impact on variety over pairs of weekdays. As in Table 2 there are no consistent differences by sex and marital status in the extent of temporal variety, except that single males are significantly more likely than their married brethren to have more routine schedules, other things (including hours of market work) equal.

Throughout the rest of this study I concentrate on married persons (in some cases on married couples), thus reducing sample sizes slightly but allowing interpretation of the results independent of marriage decisions. The results are presented separately for men and women to examine whether the impacts of the human capital and other variables differ by sex. Tables 4a and 4b thus present the same results as Table 3, but for married persons, with equations for men and women estimated separately. The most striking finding is the remarkable similarity by sex in the responses to the determinants of routine. Only on the most precisely estimated effect, that of hours of market work on weekdays, is there a consistent and statistically significant difference by sex (with an extra hour of market work increasing the temporal routine of husbands more than that of wives). The negative impacts of additional human capital on routine are roughly the same by sex. Variables measuring the presence of young children and the number of children (none of which is included in the tables in order to save space) have statistically similar small and inconsistent effects on both mothers' and fathers' temporal routine.

While the results on the impact of additional human capital are provocative, the correlation of educational attainment with the price of time means that they do not allow us to infer whether they stem from differences in household productivity (or even tastes) or differences in opportunity cost. Also, the correlation between one spouse's educational attainment and the

other's, and thus the other's income, ensures that we cannot be certain that the estimated impact of own schooling is not reflecting income effects. To account for this latter possibility I reestimate the equations describing the production of temporal routine for Australians and Germans, separately by weekdays and weekends, including measures of one's spouse's income in each equation (weekly income in Australia, monthly income in Germany).

The estimates for weekdays are shown in the first, third, fifth and seventh columns of Table 5a, while those for weekends are presented in Table 5b. Spouse's income is generally negatively correlated with the amount of temporal routine an individual produces. As the theory in Section II predicts, a rise in spouse's income generates a pure positive income effect on the demand for temporal variety, holding constant an individual's ability to produce variety (proxied by age and educational attainment). (Here I assume that spouse's income can be treated as I—ignoring, since the data do not permit addressing the issue, the possibility that the impact of spouse's income could also reflect cross-wage effects.) Also worth noting is that the estimated positive impacts of additional education on the production of temporal variety shown in Tables 4 are not greatly altered by the inclusion of this proxy for a household's other income. The results in the equations that include spouse's income provide the best evidence that an economic theory, perhaps the one outlined in Section II, is a better way of describing variations in temporal routine than merely attributing them to individual heterogeneity.

A complete, albeit imperfect accounting for human capital, other income and the price of the respondent's time is presented for working couples under age 60 in Australia and Germany on weekdays in the second, fourth, sixth and eighth columns of Table 5a. Even with sample sizes reduced by a factor of nearly three, the general conclusions from the rest of this table, and from the earlier tables remain. Additional education generally increases the amount of temporal variety produced. With both other income and a measure of the price of one's time included, this is strong evidence for the role of human capital in increasing the efficiency of household production. Also, as in the other columns of this Table, additional spouse's income increases the

temporal variety of one's activities, consistent with the theory in Section II. The new variable—the respondent's own income per hour—has a negative impact on temporal variety in Australia, consistent with the time cost of departures from temporal routine being less important than the income effects generated by higher earnings at a given hours worked in the market.[5] The results for Germany are exactly the opposite: The impact of higher own income per hour is positive, implying that the cost of generating temporal variety exceeds the income effect of higher earnings.[6]

In Section II I noted that a person's production of temporal routine generates an externality on her/his spouse. The issue is whether, other things equal, one spouse's choice of temporal routine is related to (and, as predicted, complementary with) the other spouse's. To examine this question I reestimated the models in Tables 4a and 4b (pooling weekday and weekend routine) for all three countries where spouses could be identified in the data set (thus excluding the Netherlands). The purpose is solely to see whether one's spouse's human capital and, most important, idiosyncratic temporal routine affect the other spouse's temporal routine.

The estimates that include spouse's characteristics are shown in Table 6. I focus on educational attainment and spouse's routine to save space.[7] Spouse's education has effects that are generally in the same directions as one's own education. Having a more educated spouse raises the amount of temporal variety that one generates. The more striking and highly significant result is that idiosyncratic increases in one spouse's production of temporal variety generate increases in the other spouse's temporal variety. The effects are substantial, indicating that each extra hour of variety generated idiosyncratically by one spouse leads the other to produce

[5]None of the results in on spouse's or own incomes presented in these tables are altered qualitatively if we include quadratic terms in these measures, and the quadratics themselves are never statistically significant.

[6]One could readily speculate about why we observe this stark and significant difference across the two countries, but I shall forego the pleasure.

[7]In other specifications I also included the measures of spouse's income that were included in Tables 5a and 5b. The conclusion for Germany and Australia that there are positive income effects on the demand for temporal variety is not altered when the variables that are included in Table 6 to measure the spouse's other characteristics are added to the regressions.

between 11 and 23 minutes of additional variety. Spouses' time use is complementary over time as well as at a point in time. Whether this reflects complementarities in the ability to lower the cost of producing temporal variety or correlated tastes for variety of participants in the market for spouses cannot be inferred from these results.

The complementarity of spouses' temporal variety is not symmetric, however: The effect of the wife's variety on the husband's is significantly greater than the effect of his production of variety on hers. Routine in men's daily schedules is always more strongly affected by idiosyncratic variation in their wives' routine than the opposite, whether or not we adjust for the rigidities imposed by scheduled hours of market work. The asymmetry remains if we restrict the estimates in Table 6 to working couples only, or to couples in which the wife does not work, or if we delete measures of hours of market work. This result parallels the finding in Hamermesh (2002) that the elasticity of spouses' time together is higher with respect to increases in a wife's earnings than to an increase in her husband's earnings. One interpretation is that wives have a greater preference for temporally coordinating their activities with their husbands than vice-versa.

B. Tests of Robustness

Let us first consider a few simple possibilities. One is that, even though we have included indicators for the days of the week on which the time diaries are kept, it is possible that the entire structure of responses differs across days (just as it differs between pairs of weekdays and pairs of weekend days). In particular, it is quite possible that Fridays are treated differently from the other weekdays. Accordingly pairs of days involving Friday were deleted from the samples in Tables 3 through 5, and the models were all reestimated. Other than reductions in significance levels proportionate to the square root of the reduction in sample sizes, the results did not change qualitatively.

Another possibility is suggested by concerns that the measures of routine have upper and lower bounds (1 and 0) and may not even be approximately normal. Although none of the observations was at these bounds, in the large samples from Australia, Germany and the

Netherlands tests rejected the normality of the distributions of the measures of routine. (In all three countries there was an unusually long right tail.) These findings suggested reestimating the models on which Tables 3 and 4 are based using quantile regressions at various points of the distributions of temporal routine (the 10^{th} percentile, the median and the 90^{th} percentile). Coefficient estimates from the median regressions did not differ qualitatively from those presented in the tables, nor did the results at the 90^{th} percentile of temporal routine. At the 10^{th} percentiles of the distributions of routine the results were somewhat weaker—the coefficients were less significant statistically and closer to zero in absolute value. One can infer that the estimates shown in the tables correctly describe the responses of measures of central tendency in temporal variety to the main variables of interest, but that they overstate their effects on those who generate the most temporal variety.[8]

The theory in Section II has implications for the kinds of commodities produced in the household, and developing a model of the joint determination of temporal and qualitative variety would not be difficult.[9] In a more complicated empirical model one might describe both types of variety and include each outcome in the description of the other. Difficulties of identification of such a model make estimating it beyond the scope of this study. Recognizing their relationship, however, in reexamining the demand for temporal variety I include the extent of quantitative variety (the number of different activities that the respondent undertakes over the two days) in OLS reestimates of the equations in Tables 3, 4 and 5. The results—on the human capital variables, education and the quadratic in age, and on spouse's income and own earnings—are not very different from those presented in the tables. The estimated effects are slightly smaller in magnitude, but in most cases the coefficient estimates that were statistically significant in the

[8]All of the regressions were also reestimated using ln(ROUTINE) as the dependent variable, with no qualitatively important changes in any of the results.

[9]A third kind of variety, in ordering activities, is also worth examining, although modeling it is clearly more difficult than modeling temporal and qualitative variety.

tables remained so. Unsurprisingly, there is a strong positive correlation between temporal variety and qualitative variety in all the samples.

Two of the main empirical results of this study are the complementarity of spouses' production of temporal variety and the role of human capital in increasing the ability to generate temporal variety. While we cannot definitively answer the question, we can at least explore a bit whether the former result is merely an artifact of assortative mating along the dimension of education. To examine this possibility I took the German data and created random couples. Each husband was matched randomly to a wife in the sample who was within a +/- five-year age range of him. Similarly, artificial husbands were matched to each wife by choosing randomly from among husbands within a +/- five-year age range of her. Unlike in Table 6, where at least for the women their husband's education had a substantial positive effect on the amount of temporal variety they generate, in these artificial matched data the random spouse's educational attainment had no impact on the production of variety. Also, variations in the random spouse's idiosyncratic routine were unrelated to variations in the respondent's. The complementarities demonstrated by the results in Table 6 do not arise from some general commonality of behavior among husbands and wives in the same age group.

I have examined temporal routine in all twelve aggregates of activities in the definitions of ROUTINE in (8) and (8"). It is difficult to believe, however, that individuals care about generating temporal variety in all these activities equally, or that the costs of generating variety are the same for all twelve. Variety in pure leisure activities may yield greater utility than temporal variety in timing market and homework, and that variety may also be more costly to produce. To examine this possibility I generate measures of ROUTINE that account for increasingly wide definitions of the activities over which the extent of temporal variety is measured. The narrowest measure includes only organized activities, sports and leisure, radio and television, and reading and writing—presumably those leisure activities that represent pure consumption rather than partly physical maintenance. A broader measure adds eating and other

personal activities (bathing, washing up, sex, etc.) to this narrow measure, while a still broader definition of routine adds sleep time. If the results on the impact of market work and human capital are correct, these variables should affect the amount of temporal variety generated in these subaggregates at least as strongly than in the results presented above. Indeed, the biggest effect should be in the first group, which defines pure consumption activities most narrowly.

The first three rows of each panel in Table 7a present the results of reestimating the basic equation for German husbands and wives on weekdays, while the first three rows in each panel of Table 7b show analogous results for weekends. Comparing the estimates to those in Tables 4, even for routine defined only over purely leisure activities individuals with more education are able to generate more temporal variety than their less educated fellows. Indeed, the most important thing to note is that for all three definitions of routine the effects of education are generally similar to those in the earlier tables. The finding that more educated people generate more temporal variety is not an artifact of the broad definition of activities—it holds even for those that can be defined narrowly as leisure.

The significant negative effects of additional hours of market work on temporal routine may seem inconsistent with the positive effects shown in the previous subsection. They are not. As in the earlier results, they indicate that an additional hour of market work leads to less than another hour of routine. That additional temporal variety occurs in all the non-work activities that people undertake, but particularly in pure leisure activities: Note that the effects in Table 7a on routine defined only over pure leisure are half as big as those on routine defined to include also eating, other personal activities and sleep, even though pure leisure activities account for only 31 percent of the time in this broader aggregate. While additional hours of market work create routine, workers compensate for it by increasing variety in those activities that are most like consumption and least like personal maintenance.

Yet another concern is that the estimated effects of additional human capital on temporal variety might be biased because of a difference in the precision with which respondents in

different education groups complete the time diaries. To examine this possibility I redefine ROUTINE in (8) so that an activity is counted as ROUTINE if it was performed on the second day within 15 minutes of the time it was performed on the first day. The results of reestimating the basic equations for married persons in Germany using this "fuzzy" definition of ROUTINE are shown in the bottom row of each panel in Tables 7a and 7b. The results can be compared to those for Germany on weekdays and weekends in Tables 4a and 4b. They are clear: In all four cases the fraction of the variance described by the (same set of) independent variables is greater when we define routine precisely rather than "fuzzily." Moreover, in all cases the estimated impact of low education is more positive and statistically significant, and that of high education more negative and significant in Tables 4a and 4b than in these estimates. The implied positive effect of additional education on temporal variety is not an artifact of the precision with which routine has been defined.

V. Conclusions—the Nature of Routine

Evidence presented here for four countries leads to a series of conclusions about the determinants of temporal variety. In decreasing order of confidence they are: 1) More educated people generate more temporal variety, other things equal. The effect of educational attainment may result from the ability of more educated people to overcome the costs of generating variety. 2) The presence of children, even young children, has little effect on temporal variety. 3) Additional income generated by one's spouse increases the amount of temporal variety one enjoys. This result indicates that temporal variety is a superior good. 4) The routine of spouses is complementary. 5) Higher earnings capacity, conditional on educational attainment, yields ambiguous effects on variety. This ambiguity is consistent with the role of higher time prices in producing higher full incomes, which increases the demand for temporal variety while also raising the costs of generating variety.

The gross effect of additional schooling is to increase the amount of temporal variety. Since the estimates are uniformly consistent with the inference that variety is a superior good, this

effect and the positive correlation of education and income suggest that measures of inequality that focus only on incomes ignore a component of well being that, like incomes, is correlated with education. Unlike job-related nonpecuniary benefits (Hamermesh, 1999b), since we cannot explicitly value temporal variety we cannot infer whether the income elasticity of demand for temporal variety is greater than unity. Thus while we cannot deduce the impact of accounting for this correlation on standard inequality measures, the results do imply that temporal variety increases higher-income households' well being more in absolute terms than income measures alone would indicate.

When we do things matters—for our individual well being, for the level of economic development, for the functioning of a household and for social cohesion. No doubt many of the determinants of when activities are undertaken are biological. As this study has shown, however, at least one aspect of "when"—temporal variety—is partly generated by economic decision-making. No doubt others are as well; and an interesting research undertaking would be to examine the relative importance of economic incentives in other decisions about timing as compared to the examination here and to their role in outcomes that are conventionally viewed as being more narrowly economic in nature.

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Table 1. Means, Standard Deviations and Number of Observations for Routine, by Country, Demographics and Sample

Country	Time of Week	All	Married Males	Single Males	Married Females	Single Females
Australia						
	Weekdays	.604	.654	.643	.554	.577
		(.179)	(.183)	(.189)	(.154)	(.173)
		3172	965	538	1081	588
	Weekends	.483	.495	.464	.479	.482
		(.146)	(.158)	(.172)	(.120)	(.146)
		788	250	117	265	156
Germany						
	Weekdays	.619	.673	.647	.564	.602
		(.154)	(.154)	(.174)	(.128)	(.152)
		4907	1819	529	1861	698
	Weekends	.484	.474	.499	.493	.476
		(.118)	(.122)	(.131)	(.108)	(.121)
		1042	381	120	384	157
Netherlands						
	Weekdays	.587	.635	.615	.560	.560
		(.122)	(.133)	(.143)	(.099)	(.110)
		2943	853	303	1302	485
	Weekends	.458	.453	.454	.463	.456
		(.122)	(.124)	(.141)	(.112)	(.132)
		2943	853	303	1302	485
United States						
	Weekends	.422	.409	.447	.432	.412
		(.125)	(.134)	(.146)	(.113)	(.120)
		782	281	65	321	115

Table 2. Least-squares Estimates of the Determinants of Routine

	Australia	Germany
Age	-.00057	-.00450
	(-0.52)	(-4.75)
$Age^2/100$	.0023	.0059
	(1.77)	(5.56)
Education:		
Low	.0129	.0233
	(2.81)	(6.25)
High	-.0131	-.0107
	(-1.89)	(-2.74)
Youngest child:		
Less Than 6		-.00618
		(-0.86)
0-1	.00077	
	(0.06)	
2-4	.0100	
	(0.83)	
5-9	-.00196	
	(-0.17)	
10-14	-.00933	
	(-.098)	
6-18		.00118
		(0.19)
No. Children	-.00747	-.00459
	(-1.80)	(-1.59)
Male	.0134	.0108
	(1.88)	(1.63)
Married	-.00426	.0108
	(-0.65)	(2.18)
Male* Married	-.00309	-.00649
	(-0.35)	(-0.90)
Market work week-days (hours)	.0375	.0345
	(24.72)	(29.54)
Market work week-end (hours)	.0268	.0195
	(8.94)	(7.38)
N	5482	7902
Adj. R^2	.282	.374

NOTE: t-statistics in parentheses here and in Tables 3-8. Each equation also includes indicator variables for the days of the week that are included.

Table 3. The Determinants of Routine with Weekdays and Weekends Separated

	Australia		Germany		Netherlands		United States
	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend	Weekend
Age	-.0035 (-2.61)	-.0001 (-0.04)	-.0060 (-5.33)	.0005 (0.22)	-.0044 (-3.98)	-.0028 (-2.12)	-.0079 (-3.28)
$Age^2/100$	.0058 (3.65)	.00263 (0.82)	.0071 (5.62)	.0010 (0.42)	.0065 (5.17)	.0042 (2.86)	.0098 (3.51)
Education: Low	.0174 (3.11)	.0075 (0.66)	.0281 (6.36)	.0184 (2.04)	.0391 (8.73)	.0046 (0.87)	.0216 (1.73)
High	-.0191 (-2.32)	.0030 (0.17)	-.0146 (-3.14)	-.0054 (-0.57)	-.0146 (-3.03)	-.0121 (-2.13)	-.0034 (-0.34)
Youngest Child: Less Than 6			-.0127 (-1.47)	-.0393 (-2.38)	.0042 (0.69)	-.0194 (-2.67)	
0-1	.0075 (0.53)	-.0293 (-0.91)					-.0332 (-1.68)
2-4	.0144 (1.02)	-.0370 (-1.05)					-.0117 (-0.61)
5-9	.0045 (0.33)	.0018 (0.06)					-.0196 (-0.97)
10-14	.0012 (0.10)	-.0111 (-0.46)					-.0028 (-0.15)
6-12					-.0024 (-0.40)	.0006 (0.09)	
13-17					-.0042 (-0.58)	-.0074 (-0.87)	
6-18			-.0025 (-0.35)	-.0309 (-2.01)			
No. Children	-.0081 (-1.64)	.0064 (0.58)	-.0048 (-1.39)	.0042 (0.57)	.0067 (2.31)	.0015 (0.44)	.0046 (0.88)
Male	.0148 (1.72)	-.0168 (-0.93)	.0156 (2.14)	.0294 (2.06)	.0251 (2.89)	.0143 (0.14)	.0461 (2.36)
Married	.0006 (0.08)	-.0221 (-1.35)	.0181 (3.03)	.0117 (0.97)	.0242 (4.03)	.0036 (0.51)	.0376 (2.66)
Male*Married	-.0126 (-1.16)	.0227 (1.02)	-.0066 (-0.76)	-.0478 (-2.86)	-.0356 (-3.61)	-.0093 (-0.81)	-.0679 (-3.08)

Market work week-days (hours)	.0678 (37.73)		.0568 (41.53)		.0500 (32.47)		
Market work week-end (hours)		.0083 (1.52)		-.0013 (-0.30)		-.0258 (-1.08)	-.0091 (-1.93)
N	3155	781	4907	1042	2667	2667	782
Adj. R^2	.386	.066	.370	.062	.367	.072	.042

NOTE: The equations for Australia here and in subsequent tables also include indicators of: Immigrant status, foreign language, urban and metropolitan location.

Table 4a. Regression Estimates of the Determinants of Routine of Married Persons: Weekdays Only*

	Australia		Germany		Netherlands	
	Male	Female	Male	Female	Male	Female
Age	-.0027 (-0.80)	-.0022 (-0.93)	-.0006 (-0.20)	-.0026 (-1.25)	-.00665 (-2.57)	-.0027 (-1.51)
$Age^2/100$	.0052 (1.42)	.0032 (1.21)	.0021 (0.71)	.0036 (1.62)	.0097 (3.41)	.0039 (1.91)
Education:						
Low	.0144 (1.36)	.0235 (2.83)	.0227 (2.89)	.0202 (3.23)	.0364 (4.30)	.0346 (5.70)
High	-.0212 (-1.53)	-.0077 (-0.56)	-.0188 (-2.34)	-.0240 (-3.33)	-.0076 (-0.84)	-.0167 (-2.41)
Market work (hours)	.0705 (21.21)	.0643 (20.55)	.0605 (25.9)	.0443 (18.25)	.0675 (22.21)	.0372 (12.54)
N	965	1081	1819	1861	821	1265
Adj. R^2	.371	.376	.313	.225	.423	.152

*Also included in the regressions here in and Table 4b are indicators of the age of the youngest child and the number of children.

Table 4b. Regression Estimates of the Determinants of Routine of Married Persons – Weekends Only

	Australia		**Germany**		**Netherlands**	
	Male	Female	Male	Female	Male	Female
Age	-.0009 (-0.13)	.0088 (1.94)	-.0024 (-0.45)	-.0002 (-0.04)	-.0034 (-1.21)	-.0018 (-0.85)
$Age^2/100$	.0046 (0.62)	-.0084 (-1.61)	.0047 (0.87)	.0018 (0.38)	.0051 (1.65)	.0033 (1.37)
Education: Low	-.0040 (-0.19)	.0064 (0.39)	.0537 (3.47)	.0036 (0.28)	-.0004 (-0.05)	.0115 (1.61)
High	.0235 (0.80)	-.0476 (-1.71)	.0293 (1.86)	-.0198 (-1.23)	-.0059 (-0.58)	-.0140 (-1.74)
Market work (hours)	.0300 (3.82)	-.0207 (-1.83)	-.0039 (-0.60)	-.0049 (-0.53)	-.0495 (-8.00)	-.0412 (-5.83)
N	250	265	381	384	821	1265
Adj. R^2	.134	.140	.080	.055	.130	.072

Table 5a. Regression Estimates of the Determinants of Routine of Married Persons: Weekdays Only with Spouse's Income, Also Own Income per Hour for Younger Two-earner Couples

	Australia				Germany			
	Male		Female		Male		Female	
	All	Two earners	All	Two earners	All	Two earners	All	Two earners
Age	-.0037	-.0016	-.0029	.0028	-.0009	-.0043	-.0014	.0027
	(-1.02)	(-0.18)	(-1.13)	(0.41)	(-0.31)	(-0.69)	(-0.64)	(0.48)
$Age^2/100$	.0065	.0039	.0038	-.0444	.0023	.0058	.0024	-.0032
	(1.66)	(0.36)	(1.32)	(-0.49)	(0.77)	(0.83)	(1.03)	(-0.48)
Education:								
Low	.0122	.0259	.0216	.0457	.023	.0244	.0157	.0056
	(1.09)	(1.35)	(2.46)	(3.04)	(2.90)	(1.98)	(2.46)	(0.50)
High	-.0140	.0011	-.0039	-.0008	-.0184	-.0114	-.0189	-.0207
	(-0.93)	(0.05)	(-0.26)	(-0.04)	(-2.25)	(-0.89)	(-2.55)	(-1.68)
Market work	.0730	.0400	.0628	.0373	.0605	.0364	.0427	.0286
(hours)	(20.33)	(12.98)	(18.36)	(15.49)	(25.56)	(16.44)	(17.14)	(16.19)
Spouse's	-.0068	.00053	-.0014	.00092	-.0060	-.0073	-.0057	-.0043
Income (000)	(-1.20)	(0.06)	(-0.35)	(0.12)	(-1.85)	(-1.41)	(-3.73)	(-1.50)
Own Income/		-.0026		-.0005		.00013		.00017
Work Hour		(-1.97)		(-0.65)		(2.17)		(4.25)
N	883	356	988	324	1773	665	1815	667
Adj. R^2	.369	.359	.363	.534	.316	.341	.228	.370

NOTE: Tables 5 include all the controls in Tables 4.

Table 5b. Regression Estimates of the Determinants of Routine of Married Persons – Weekends Only with Spouse's Income

	Australia		Germany	
	Male	Female	Male	Female
Age	-.0025	.0078	-.0023	.0020
	(-0.35)	(1.65)	(-0.41)	(0.44)
$Age^2/100$	.0060	-.0073	.00501	-.0006
	(0.78)	(-1.37)	(0.87)	(-0.12)
Education:				
Low	-.0079	.0058	.0489	.0006
	(-0.36)	(0.33)	(3.09)	(0.05)
High	.0246	-.0395	.0250	-.0177
	(0.77)	(-1.38)	(1.56)	(-1.09)
Market work	.0327	-.0183	-.0034	-.0061
(hours)	(4.14)	(-1.54)	(-0.51)	(-0.64)
Spouse's	-.0298	-.0100	.0060	-.0050
Income (000)	(-2.54)	(-1.22)	(1.16)	(-1.80)
N	231	244	368	375
Adj. R^2	.167	.145	.079	.065

Table 6. Regression Estimates of the Determinants of Routine of Married Persons -- Including Spouse's Characteristics

	Australia		Germany		United States	
	Male	Female	Male	Female	Male	Female
Education:						
Low	.0145	.0132	.0113	.0098	.0154	.0257
	(1.66)	(1.83)	(1.76)	(1.96)	(0.34)	(0.72)
High	.0016	.0003	-.0063	-.0107	.0347	.0197
	(0.13)	(0.02)	(-0.92)	(-1.81)	(1.07)	(0.67)
Spouse's Education:						
Low	.0143	-.0092	-.0008	.0121	.0650	.0092
	(1.61)	(-1.29)	(-0.14)	(2.24)	(1.33)	(0.26)
High	-.0123	-.0269	-.0028	-.0064	-.0116	-.0115
	(-0.79)	(-2.65)	(-0.40)	(-1.12)	(-0.35)	(-0.40)
Routine	.328	.213	.351	.252	.386	.187
	(10.71)	(10.66)	(16.47)	(16.72)	(2.93)	(2.44)
N	1541	1541	2827	2891	102	118
Adj. R^2	.397	.314	.522	.296	.132	.095

NOTE: Table 6 includes all the controls in Tables 4 plus the spouse's: Age, age-squared, and hours of weekday and weekend market work.

Table 7a. The Determinants of Alternative Definitions of Routine: Married Germans, Weekdays

Male (N = 1773)

Routine Defined As	Other Income (000)	Age	Age²/100	Education: Low	Education: High	Market work (hours)	Adj. R^2
Pure leisure	.0012	-.0007	.0012	.0058	-.0071	-.0156	.202
	(0.90)	(-0.62)	(0.97)	(1.77)	(-2.10)	(-15.94)	
Plus eating, other personal	-.0013	-.0008	.0017	.0068	-.0087	-.0157	.203
	(-0.88)	(-0.64)	(1.20)	(1.86)	(-2.29)	(-14.34)	
Plus sleep	-.0034	-.0005	.0020	.0083	-.0089	-.0317	.316
	(-1.62)	(-0.29)	(1.07)	(1.63)	(-1.70)	(-20.93)	
"Fuzzy" Routine	-.0038	-.0016	.0034	.0208	-.0139	.0530	.246
	(-1.13)	(-0.55)	(1.09)	(2.52)	(-1.65)	(21.65)	

Female (N = 1815)

Routine Defined As	Other Income (000)	Age	Age²/100	Education: Low	Education: High	Market work (hours)	Adj. R^2
Pure leisure	-.0080	-.0029	.0031	.0092	.0004	-.0108	.111
	(-1.14)	(-2.87)	(2.92)	(3.14)	(0.14)	(-9.45)	
Plus eating, other personal	-.0011	-.0033	.0041	.0086	-.0002	-.0113	.133
	(-1.49)	(-3.00)	(3.46)	(2.70)	(-0.06)	(-9.06)	
Plus sleep	-.0029	-.0069	.0082	.0141	.0029	-.0222	.210
	(-2.78)	(-4.63)	(5.21)	(3.28)	(0.57)	(-13.19)	
"Fuzzy" Routine	-.0059	-.0014	.0025	.0104	-.0135	.0288	.114
	(-3.62)	(-0.58)	(1.01)	(1.53)	(-1.69)	(10.83)	

NOTE: Tables 7 include all the controls in Tables 4.

Table 7b. The Determinants of Alternative Definitions of Routine: Married Germans, Weekends

Male (N = 368)

Routine Defined As	Other Income (000)	Age	Age²/100	Education: Low	Education: High	Market work (hours)	Adj. R²
Pure leisure	-.0006	-.0048	.0060	.0205	.0007	-.0190	.104
	(-0.18)	(-1.31)	(1.60)	(2.01)	(0.07)	(-4.43)	
Plus eating, other personal	-.0004	-.0052	.0066	.0248	.0079	-.0193	.123
	(-0.11)	(-1.39)	(1.75)	(2.41)	(0.76)	(-4.45)	
Plus sleep	.0015	-.0039	.0064	.0321	.0109	-.0488	.237
	(0.34)	(-0.76)	(1.23)	(2.28)	(0.77)	(-8.25)	
"Fuzzy" Routine	.0071	-.0036	.0069	.0471	.0314	-.0118	.075
	(1.28)	(-0.59)	(1.10)	(2.76)	(1.83)	(-1.66)	

Female (N = 375)

Routine Defined As	Other Income (000)	Age	Age²/100	Education: Low	Education: High	Market work (hours)	Adj. R²
Pure leisure	.0018	-.0069	.0079	.0104	-.0137	-.0190	.063
	(0.95)	(-2.19)	(2.36)	(1.19)	(-1.25)	(-2.97)	
Plus eating, other personal	.0017	-.0063	.0074	.0103	-.0142	-.0217	.083
	(0.88)	(-1.93)	(2.17)	(1.15)	(-1.26)	(-3.27)	
Plus sleep	-.0023	-.0007	.0015	.0005	-.0206	-.0552	.167
	(-0.96)	(-0.17)	(0.35)	(0.04)	(-1.47)	(-6.72)	
"Fuzzy" Routine	-.0052	.0006	.0013	-.0061	-.0138	-.0217	.047
	(-1.72)	(0.11)	(0.25)	(-0.43)	(-0.78)	(-2.14)	