

The Allocation of Time:
Complementary and Substitutive Activities

by

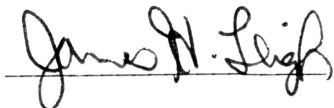
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A handwritten signature in black ink, appearing to read "James H. Leigh". The signature is written in a cursive style and is positioned above a horizontal line.

Dr. James H. Leigh

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Abstract

A review of time-related consumer behavior literature is given. A time use questionnaire administered to 360 business students is used to study complementarity and substitutability among activities. Bivariate correlations supported the existence of complementary and substitutive activities.

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Table of Contents

Introduction.....	1
Review of the Literature.....	3
Introduction.....	3
Theory and Concepts.....	5
Complementarity and Substitutability.....	10
Methodology.....	13
Sample.....	13
Questionnaire.....	14
Limitations of the Questionnaire.....	16
Analysis.....	18
t-test.....	18
Bivariate Correlations.....	19
Results.....	21
Criterion Group Validity Assessment.....	21
Bivariate Correlations.....	25
Substitutes.....	33
Complements.....	34
Related Activities.....	35
Other Relationships.....	36
Conclusion.....	38
Limitations and Implications.....	39
References.....	41
Appendix A - Questionnaire.....	47
Appendix B - Bivariate Correlation Matrices.....	51

List of Tables

Table 1: Three Types of Activities.....	15
Table 2: Results of the t-test.....	22
Table 3: Complements, Substitutes, and Related Activities.....	27

INTRODUCTION

Everyday of the year consumers must decide how to allocate their time to different activities. Their decisions are bound by the fact that time is a limited resource. The 24 hours in each day must be allocated between obligatory and nonobligatory activities, depending on the consumer's respective responsibilities, needs, and wants. Thus, many activities are competing for the consumer's time. The patterns of time use that result from this process of consciously allocating time to activities is the focus of this study. To be specific, the concepts of complementarity and substitutability among and between activities is analyzed. For the purposes of this study, complementary activities are those that are participated in concurrently, and substitutive activities are those that replace one another in the time budget.

If the validity of these concepts (complementarity and substitutability) can be determined, the resulting time-oriented research could prove helpful to marketers in several ways. First, the possibilities for improving promotional activities (especially advertising) are promising. For example, if a marketer knows what activities are complementary among the members of the target market, ad copy and background material can reflect more fully the true characteristics and behavior patterns of

the intended audience. Second, the concepts would provide an effective means for segmenting the market. People with the same activity patterns can be considered a market segment. Third, such research could be helpful in new product development. If the activities a person participates in are known, the products being used can be implied. Developing products which are used with (or in place of) a current product could be a successful alternative for growth. Finally, demand for a product can be studied in terms of time allocated to its use in an activity. Once complementary and substitutive activities are found, it might be possible to improve the ability to predict, stimulate, or define demand. In summary, research on time usage not only has theoretical applications, but also practical uses that are possible and potentially quite valuable to marketers in the field.

REVIEW OF THE LITERATURE

Introduction

There is a general consensus among consumer behavior researchers that the role of time needs to be incorporated into the study of consumer behavior (Arndt and Grønmo 1977; Felson 1975; Hawes 1980; Hawes, Grønmo, and Arndt 1978; Jacoby, Szybillo, and Berning 1976; Settle 1980; Voss and Blackwell 1975). Much theoretical and conceptual development is needed (Felson 1975; Hawes 1980; Jacoby, Szybillo, and Berning 1976; Settle 1980) along with a standardization of terminology (Jacoby, Szybillo, and Berning 1976). Many excellent reviews of time-oriented consumer behavior research conducted thus far are available (Hawes 1980; Holman and Venkatesan 1979; Johnston 1981). In his review of time research, Hawes (1980) notes that time is treated generally as a baseline parameter in models of consumer behavior and is considered an exogenous constraint in that it is a fixed resource. However, much of the recent research into consumers' use of time has attempted to establish time as a major variable in models of consumer behavior (discussed under the subheading Theory and Concepts). Having noted the importance of time as a variable in consumer behavior research, it is also necessary to note the importance of the time variable to marketers in the field. Venkatesh, Vitalari and Grønhaug

(1983) studied the effects of new product adoption on the allocation of time by members of the household. They stated the importance of the time variable to marketing strategists in the following manner. "Intuitive marketing implications are that time related consequences as well as the present time allocation by individuals and households should be brought into account when designing marketing strategies . . ." (Venkatesh et al. 1983, p. 61).

Much of the impetus for the recent research involving consumers' allocation of time was provided by Becker (1965). In his economic theory, activities are viewed as productive processes. The two inputs of time and goods are combined in order to minimize the cost of the activity to the consumer. Therefore, the allocation of time should be treated with the same significance as is the allocation of goods. Since Becker's theory, many consumer behavior researchers have recognized similar concepts. Arndt and Grønmo (1977) identify time as a scarce resource that is equivalent to the scarce resource of money. Voss and Blackwell (1979) state that consumers spend both money and time in seeking satisfaction, and therefore goods and services have both time and money prices. Also, Voss and Blackwell (1975) note that consumers are constrained in their actions by two budgets: a money budget and time budget. Thus, the recognition of time as a valued and

scarce resource has paved the way for a new area of research.

Theory and Concepts

the total time available to the consumer is equal to the time spent working plus the time spent not working. This has been a traditional definition of time with the time away from work being referred to as leisure time. However, a more accurate definition of time available to the consumer is nondiscretionary time plus discretionary time. Nondiscretionary time is work time plus all other necessary activities which must be done, regardless of the consumer's preferences. This newer definition of time has been used in the recent collection of research involving consumers' time allocation. Many researchers are interested in the allocation of discretionary time since this is the area where consumers have greater latitude in making decisions (Hendee and Burdge 1974; Holbrook and Lehmann 1981; Hawes 1977; Voss and Blackwell 1975; Voss and Blackwell 1979).

Many factors have been shown to affect time allocation. Hornik (1982) determined that situational events, as well as the interaction of such events with individuals' preferences and traits, affect time allocation. In their study of media time use by consumers, Hornik and Schlinger (1981) found that socioeconomic, demographic,

and psychographic factors accounted for variances in media exposure. Hendrix, Kinnear, and Taylor (1979, p. 42) suggest that the allocation of time by others may affect one's own allocation of time.

Of the factors mentioned above, demographics and psychographics have been given the most concern in research thus far (Bryant and Gerner 1981; Hawes 1977; Hendrix 1980; Hendrix, Kinnear, and Taylor 1979; Strober and Weinberg 1980). In their analysis of television use by family members, Bryant and Gerner (1981) found that hours of employment affected the use of television by husbands and wives. Strober and Weinberg (1980) studied the strategies used by employed and nonemployed wives to reduce the pressures placed on them by time constraints. Though they found little difference between employed and nonemployed wives in their strategy uses, their review of literature found that working wives allocate less time to housework, leisure, volunteer activities, and sleep than nonworking wives. Hill (1985) noted differences in time use based on the demographic characteristics of gender, and marital status, work load, and geographic location. For instance, men were found to spend twice as much time as women on labor market work and education, and women spent twice as much time as men on household work. In his study of subjective elements involved in time allocation,

Hendrix (1980) found it possible to explain variations in time expenditures by using enjoyment as a measure of affect. Hendrix, Kinnear, and Taylor (1979) suggest that satisfaction and individual preferences interact to determine the time allocated to activities.

Apart from determining what factors affect time allocation of the consumer, little conceptual and theoretical work has been completed. In the area of conceptual development, Holbrook and Lehmann (1981) have addressed the concept of complementary activities, and Hendee and Burdge (1974) have addressed the concept of substitutable activities (these works are discussed under the subheading Complementarity and Substitutability). A very interesting concept was developed by Hendrix and Martin (1981). They introduced the concept of temporal incongruency. A person who allocates more or less time than preferred to an activity is temporally incongruent regarding that activity. One reason suggested for temporal incongruency is the existence of conflicting immediate and longer term preferences (e.g., a college student may spend more time studying than preferred because he prefers the best job opportunities possible in the future). Hendrix and Martin propose the usefulness of temporal incongruency with respect to a particular activity as an indicator of shifts in demand. In the area of theoretical development,

Feldman and Hornik (1981) provide a multidisciplinary model of time allocation as well as time constructs. In general, their theory states that an individual's allocation of time is determined by the interaction of economic factors, an individual's preferences and personal characteristics, and situational factors. Hendrix, Kinnear, and Taylor (1979) provide a more extensive theory of time allocation. In their theory, activities are conceptualized as processes having the inputs of time, energy, goods, services, and desired outputs. Certain anterior conditions (e.g., age, health, stage in the family life cycle) place constraints on the latitude an individual has in allocating time. The allocation of time to a set of elastic activities (i.e. discretionary) is constrained by the allocation of time to inelastic activities. Mediating factors (e.g., allocation of time by others, resources, role ideology) could possibly account for differences in patterns of time allocation not explained by anterior conditions. In another paper, Hendrix (1984) proposes that models of time allocation can be improved by including antecedents and consequences of time use. In his paper, he examined a variety of measures termed "antecedents" (e.g., roles, attitudes) and "consequences" (e.g., productivity, satisfaction) of time use. These

measures were found to vary across subgroups based on demographic variables.

Outside the immediate realm of consumer behavior, time has been the basis for social accounting systems (Ruggles 1981) and the basis for a social indicator (Hobson and Stuart 1974). Ruggles (1981, p. 459) notes that the advantages of using time as the basis for social accounting systems include the fact that "many different phenomena . . . can all be located with reference to time and space without interfering with their unique features." Hobson and Stuart developed a social indicator (Lamda) which is based on patterns of human time allocation to activities. Lamda does not have the problems of demand characteristics and experimenter bias that most subjective social indicators have (e.g., those derived from questionnaires).

Time as a measure of activity has been shown to be a valid measure (Szybillo, Binstok, and Buchanan 1979). Szybillo, Binstok, and Buchanan studied the convergent validity and discriminant validity of leisure time activity measures. Using time budgets and psychographics as measures, both types of validity were met. However, sometimes time as a subjective measure can be biased. Hendrix and Qualls (1981) used self-report and time-budget data to study subjective measures of household task

responsibility. Their findings show that subjective measures may be systematically biased (e.g., the males in their study overestimated time allocated to household tasks). Webb (1979) discovered similar overestimations of time by consumers in his study of the effects of clutter (non-program material on television) based on consumers' perception of time duration. Webb found that the amount of time devoted to commercials was significantly overestimated. Thus, even though time as a measure can be valid, researchers have to be aware of certain biases that can exist when using consumers' estimates to determine time measures.

Having discussed several theories and concepts related to time use research, the next subjects discussed will be the concepts central to this paper.

Complementarity and Substitutability

In an economic sense, the concepts of complementary and substitutive goods has long existed. Bass, Pessemier, and Tigert (1969) supported these concepts in their study of complementary and substitute relationships between purchase and usage rates of products. However, this paper is concerned with the concepts of complementary and substitute activities. In particular, the allocation of time among competing activities and the resulting relationships are the focus of this study. This particular

area of study is noted as being very significant in studying situational influences on consumer behavior (Leigh and Martin 1981, p. 65).

Holman and Venkatesan (1979, p. 36) note that "Many activities of interest to consumer behavior researchers occur simultaneously . . ." They further state that the current classifications of activities is inadequate. Jacoby, Szybillo, and Berning (1976) briefly mention the concept of concurrent time usage (i.e., participating in two or more activities simultaneously), posing the question of whether or not primary and secondary time usage can be identified. Johnston (1981) mentions that some people have the ability to do two or more things at one time; he terms these people as being "multi-phasic." No matter how these authors have chosen to describe the concept, they are all discussing the existence of complementary activities.

Empirical evidence concerning the existence of complementary activities is provided by Holbrook and Lehmann (1981). In their study, complementary activities were found on the basis of discretionary time allocated to the activities. Fifty activities were clustered based on the hypothesized existence of complementarity among the activities. Partial correlations and MDS

(multidimensional scaling) analysis were used to support the hypothesized complementary relationships.

Empirical evidence concerning the existence of substitute activities has been provided by O'Leary, Field, and Schreuder (1974) and by Hendee and Burdge (1974). O'Leary et al. (1974) determined that activities are interchangeable depending on who composes the social group. Thus, social groups involved in leisure activities are a basis for substitution. Hendee and Burdge (1974) suggest the existence of substitute activities in their study of leisure activities. In their study, leisure activities were categorized into five clusters on the basis of similar participation patterns and activity rates of the participants (categorization was done by means of factor analysis). Their findings suggest the potential existence of substitutability within and between the activity clusters. Though they stress the suggestiveness of their findings, their methodology has not escaped criticism (Beaman 1975; Becker 1976).

Having noted prior research involving substitutes and complements, this paper attempts to provide more empirical evidence of the existence of complementary and substitutive activities.

METHODOLOGY

Sample

The data set was obtained from a time use questionnaire that was administered to 360 business students at Texas A&M University in 1983. The sample was approximately 46% males and 54% females. 41% of the students were employed and 59% were not employed.

This sample is obviously not representative of the entire U.S. population, the college student population, nor even the whole student population at Texas A&M. However, because the purpose of this study was to gain empirical evidence concerning the existence of complementary and substitutive activities (rather than to project the findings to a larger sample or a population), the sample was deemed appropriate, as everyone must regularly make time allocation decisions.

The sample is likely somewhat biased in that the respondents are predominately young, and also in that the time budgets of the respondents seem to have more constraints concerning nondiscretionary activities, especially considering the 41% of the respondents who both work and attend school. The youth factor could result in higher participation rates in more active activities than if a sample had been used that is representative of all age groups. The possible fact that, for the employed

students, an above average amount of time is allocated to nondiscretionary activities may cause different patterns of complementarity and substitutability than if a more representative sample of the U.S. population had been used.

Having noted these characteristics of the sample, its usefulness in obtaining empirical evidence of complementarity and substitutability is still considered valid.

Questionnaire

A copy of the questionnaire may be found in Appendix A. Due to time constraints, only questions 1a, 2, 3, 4, and 7 are used in this study. The questions are worded so that the respondent was required to estimate the average number of hours spent per day or per week participating in the different activities.

The activities studied can be divided into three categories as shown in Table 1. First, there are discretionary activities which are defined as those activities participated in by choice rather than necessity (e.g., listening to music, watching television, going to night-clubs). Second, there are nondiscretionary activities which are defined as those activities participated in out of necessity (e.g., sleeping, meal preparation and consumption, work or school related activities). Finally, there are those activities which may be discretionary or

Table 1: Activity Categories

<u>Discretionary</u> time spent:	<u>Nondiscretionary</u> time spent:
Visiting with family/room-mates	On housework, home, maintenance
Entertaining guests	On meal preparation/consumption
Watching television	On personal hygiene/getting dressed
Listening to music	On laundry
Leisure reading	On work/school related activities
At restaurants	Sleeping
At movie theaters	In transit for work/school
At nightclubs	<u>Individually Specific</u> time spent:
At outdoor sporting events	At church
At indoor sporting events	At community/civic activities
At concerts/cultural events	Shopping
At recreational area	Visiting friends/relatives at their residence
	In transit for activities other than work/school
	Out of town on overnight trip
	Traveling to and from usual overnight destination

nondiscretionary depending on the particular individual. Such activities are termed "individually specific." Examples include attending church or shopping.

Limitations of the Questionnaire

The first limitation that seems obvious is that the questionnaire requires the respondent to estimate the amount of time spent on an activity. Due to the retrospective nature of the questions, respondents may have overestimated (or underestimated) actual time spent on a particular activity or in total for a particular day. No constraints were placed on the procedure, however, because it was believed that respondents would be more likely to provide reasonable relative estimates of time being allocated to particular activities.

A second limitation of the questionnaire procedure is that it is difficult to identify substitutive activities based on the total amount of time spent daily or weekly on different activities. Perhaps the questionnaire would have been better at identifying substitutes if it had been worded to ask the respondent what activities he would substitute for others, but that too has its own set of limitations (social desirability and the like). Perhaps a time diary approach would be more helpful than a time usage questionnaire because then activities which are participated in simultaneously (complements) can be easily

identified. It was believed that each of these alternatives has strong limitations, some of which would have contaminating influences on the relationships of interest. Rather, an indirect and thereby conservative approach to identifying complementary and substitutive activities was followed instead.

Procedure

The questionnaire used in this study was administered as a mind clearing device in another study. The data was then saved for future use.

ANALYSIS

For purposes of analysis, two statistical tests were performed on the data using the SPSS software package. The first was a t-test to check the reliability of the data, and the second was the calculation of bivariate correlations to determine complementarity and substitutability.

t-test

A t-test on independent sample means was used to compare the differences in average time allocation to activities between males and females and between those students who work and those who do not work. If certain patterns of time usage that should logically exist among these two dichotomies do in fact hold true, the data can be considered to possess criterion group validity. It was hypothesized that females would spend more time on personal care activities (e.g., personal hygiene and getting dressed) and domestic chores (e.g., housework, laundry, meal preparation) than do males. It was also hypothesized that respondents who worked would report spending less time on discretionary activities (e.g., watching television, visiting with others, leisure reading) than do respondents who do not work.

Bivariate Correlations

Bivariate correlations were calculated across all variables to determine complementarity and substitutability among the activities. A significant positive correlation means one of two things. First, the two activities are truly complements in that they are performed concurrently. A second interpretation of a positive correlation is that the two activities are merely related in degree of participation by the respondent, but they do not necessarily occur at the same time. Researcher judgement must be used to determine the underlying basis for the relationship--complementary or simply related activities. A significant negative correlation indicates that the activities are substitutes, whereas a nonsignificant correlation identifies two unrelated activities.

Correlations were computed for the total sample and separately for the subgroups formed by the respective dichotomies of male/female and work/don't work. It was hypothesized that the patterns of complementarity and substitutability would be different between the subgroups (i.e., males versus females, work versus do not work), due to the role of demographic variables (gender and employment status). For each set of analyses, subgroup comparisons of correlations were made both within and

across the three categories of activities--discretionary, nondiscretionary, and individually specific. A running tabulation of significant complements, related activities, and substitutes for each set of correlation comparisons was made.

The primary hypothesis of this study is that complementary and substitutive activities based on time allocation do in fact exist and vary, depending on the gender of the individual and on whether or not the student works.

RESULTS

Criterion Group Validity Assessment

The results of the t-test are provided in Table 2. The hypothesized relationships that should logically exist within the two dichotomies do in fact exist. Females spent more time during the week on housework and home maintenance than males did, and females spent more time throughout the entire week doing laundry than males did. Also, females spent more time on personal hygiene and getting dressed throughout the week than did males. Thus, women differed from men in allocating time to personal care and domestic chores. Women also allocated more time to shopping. Two surprising findings were that women did not spend a significantly greater amount of time on meal preparation or significantly less time at sporting events. This can be explained by the fact that all respondents were college students. Some students dine in campus cafeterias or don't have time to spend preparing meals (regardless of gender), and the majority are unmarried and must cook for themselves (men and women alike). Concerning attendance at sporting events, such events are popular among both men and women at college, therefore it can be reasoned that there would be no significant differences between males and females in time allocation to sporting events.

Table 2: Results of the t-Test

Discretionary Activity	Male/Female		Work/Don't Work	
	Mean	t-value	Mean	t-value
Visiting with family/roommates (WD) (WE)	2.60/2.92 4.10/4.55	-1.15* -1.24*	2.31/3.07 3.40/4.57	-2.98b -1.62*
Entertaining guests (WD) (WE)	.98/1.16 2.62/2.93	-1.58 -1.12*	.91/1.20 2.64/2.88	-2.52a -.84
Watching television (WD) (WE)	1.69/1.65 2.73/2.42	.28* 1.60*	1.43/1.85 2.39/2.67	-2.84b -1.45*
Listening to music (WD) (WE)	2.18/2.19 2.90/3.24	-.03* -1.04*	2.12/2.27 3.01/3.17	-.56* -.51*
Leisure reading (WD) (WE)	.60/.49 .89/.93	1.38 -.39	.55/55 .85/.97	.07 -1.10*
At restaurants	2.79/3.03	-.91	2.99/2.87	.41
At movies (warm, sunny weather)	.67/.66	.09*	.52/.76	-2.21a
At movies (rainy, wintry weather)	1.42/1.79	-2.37a	1.41/1.77	-2.37a
At nightclubs	4.21/3.74	1.06	3.87/4.02	-.35*
At outdoor sporting events: Fall	3.95/3.93	.05	3.92/3.91	.00
Winter	1.76/1.61	.43	1.72/1.64	.23
Spring	3.41/3.44	-.08*	3.23/3.53	-.70*
Summer	4.12//4.22	-.19	3.63/4.51	-1.65
At indoor sporting events: Fall	1.38/1.15	.81*	1.22/1.26	-.14
Winter	2.37/2.04	1.04*	1.97/2.32	1.11*
Spring	1.55/1.17	1.50	.97/1.59	-2.73b
Summer	1.05/.83	1.05	.71/1.07	-1.80

Table 2: Continued

	<u>Male/Female</u>		<u>Work/Don't Work</u>	
	<u>Mean</u>	<u>t-value</u>	<u>Mean</u>	<u>t-value</u>
<u>Discretionary Activity</u>				
At concerts and cultural events	1.04/.94	.74*	.94/1.01	-.54*
At recreational areas: Fall	2.47/2.50	-.06	2.16/2.70	-1.21
Winter	1.26/.71	1.65	.87/1.03	-.54
Spring	4.21/4.39	-.36	3.83/4.61	-1.51*
Summer	6.57/7.24	-.93	6.27/7.34	-1.45*
<u>Nondiscretionary Activity</u>				
Housework/home maintenance	.78/1.03	-3.05 ^b	.88/.94	-.75
	1.39/1.62	-1.69*	1.61/1.47	1.00*
Meal preparation & consumption	1.56/1.63	-.64	1.46/1.70	-2.39 ^a
	1.85/1.89	-.25*	1.83/1.92	-.68*
Personal hygiene/ getting dressed	1.15/1.87	-9.47 ^C	1.43/1.63	-2.48 ^a
	1.17/1.95	-8.63 ^C	1.49/1.68	-1.81*
Laundry	.38/.54	-2.41 ^a	.41/.50	-1.27
	.80/1.25	-4.60 ^{C*}	.98/1.08	-.98*
Work or school related activities	5.84/5.21	1.83*	6.33/4.91	4.18 ^{C*}
	3.43/3.47	-.15*	4.38/2.83	5.28 ^C
Sleeping	6.88/6.83	.46*	6.77/6.91	-1.14*
	7.95/7.80	.91*	7.73/7.97	-1.41*
In transit to and from work/school	2.56/2.92	-1.01	3.09/2.55	1.54

Table 2: Continued

	<u>Male/Female</u>		<u>Work/Don't Work</u>	
	<u>Mean</u>	<u>t-value</u>	<u>Mean</u>	<u>t-value</u>
<u>Individually Specific Activities</u>				
At church	1.41/.91	.91	1.14/.92	.80
At community and civic activities	.39/.42	-.21*	.29/.49	-1.75
Shopping	2.05/3.40	-5.37C	2.63/2.86	-.90
Visiting friends/relatives at their residence	4.59/6.19	-2.05a	5.36/5.16	-.19*
In transit for other activities	2.78/2.88	-.38	2.89/2.83	.20*
Days out of town on overnight trip	2.92/2.94	-.12*	2.74/3.08	-1.61*
In transit to and from usual (overnight) destination	2.87/3.71	-2.19a	2.71/3.73	-2.71b

KEY:

*t-value based on pooled variance estimate (all other t-values based on separate variance estimate).

 $\alpha = .05$ a: $p < .05$ b: $p < .01$ c: $p < .001$ H_0 : means = H_1 : means \neq

$$t = \frac{x_1 - x_2}{\sigma \sqrt{\bar{x}_T}}$$

where x_1 = male or work x_2 = female or don't work

WD = weekday

WE = weekend day

Working students showed a fairly consistent pattern of spending significantly less time on discretionary and nondiscretionary (except work/school related) activities. Working students spent less time during weekdays on nondiscretionary activities such as meal preparation and consumption, and personal hygiene and dressing. Working students spent less time during weekdays on discretionary activities such as entertaining guests, watching television, and visiting with family and/or roommates. Having less time during a weekday to spend on activities (discretionary or nondiscretionary) is indicative of the fact that students who work have less time to allocate to non-work related activities than non-working students because they also must attend school on weekdays.

In summary, women did allocate more time to domestic chores and personal care than men. Also, working students allocated less time not only to discretionary activities, but to nondiscretionary activities as well. Since these logical relationships were found, and, since no unexplainable illogical relationships were found, the data set was considered to possess criterion group validity.

Bivariate Correlations

The bivariate correlation matrices can be found in Appendix B.

The results show a large number of complements and related activities and a small number of substitutes. A fairly consistent pattern of complementarity and substitutability resulted between the subgroups formed by the two dichotomies of male/female and work/don't work.

Overall, at the .05 significance level, a very small percentage of activities were significantly negatively correlated, about half of the activities were unrelated (nonsignificant r), and a fair percentage were significantly positively correlated. This suggests the possible existence of complementary or related activities, but does not necessarily outrule the existence of substitutes. As mentioned earlier, it is believed that the structure of the questionnaire made the identification of substitutes difficult.

As the patterns of complementarity and substitutability were fairly consistent between the subgroups, it may be that variables other than demographics (e.g., psychographics, the nature of the activities, etc.) have a bearing on patterns of time use. However, this is just a hypothesis and would need further research in order to determine such a situation.

The complements, related activities, and substitutes that resulted seem to be fairly intuitive and obvious (a listing of these results can be found in Table 3).

Table 3: Complements, Related Activities and Substitutes

Complements

Visiting with family/roommates (WD/WE) and:	entertaining guests (WD/WE) watching television (WD/WE) listening to music (WD/WE) meal preparation/consumption (WD/WE)
Entertaining guests (WD/WE) and:	listening to music (WD/WD) watching television (WD) meal preparation/consumption (WE)
Listening to music (WD/WE) and:	leisure reading (WD/WE) work/school related activities (WE)
Housework/home maintenance (WD/WE) and:	meal preparation/consumption (WD/WE) laundry (WD/WE) watching television (WE)
Personal hygiene/dressing (WD) and:	in transit for activities other than work/school in transit to and from usual (overnight) destination indoor sports (winter) outdoor sports (fall) recreational areas (fall, spring, summer)

Table 3: Continued

<u>Substitutes</u>	
Laundry (WD) and:	laundry (WE)
Church and:	nightclubs
Community/civic activities and:	watching television (WD)
Work/social related activities (WD/WE) and:	watching television (WD/WE) sleeping (WD/WE) indoor sports (summer)
Sleeping (WE) and:	outdoor sports (fall, winter) entertaining guests (WD) days out of town on an overnight trip
<u>Related Activities</u>	
Visiting with family/roommates (WD) and:	visiting with family/roommates (WE) listening to music (WE) leisure reading (WD) entertaining guests (WE) housework/home maintenance (WE) meal preparation/consumption (WE) personal hygiene/getting dressed (WD)
Visiting with family/roommates (WE) and:	entertaining guests (WD) listening to music (WD) meal preparation/consumption (WD) personal hygiene/dressing (WD)

Table 3: Continued

Related Activities

Entertaining guests (WD) and:	entertaining guests (WE) listening to music (WE) nightclubs recreational areas (spring) leisure reading (WD) outdoor sporting events (spring, summer) community/civic activities personal hygiene/dressing (WE)
Entertaining guests (WE) and:	listening to music (WD) personal hygiene/dressing (WD/WE)
Watching television (WD) and:	watching television (WE) shopping
Listening to music (WD) and:	listening to music (WE)
Listening to music (WE) and:	movies, (rainy, winter weather) nightclubs
Leisure reading (WD) and	leisure reading (WE) concerts/cultural events community/civic activities
Leisure reading (WE) and:	concerts/cultural events community/civic activities

Table 3: Continued

Related Activities

Restaurants and:	recreational areas (fall, winter, spring, summer) visiting friends/relatives at their residence
Movies (warm, sunny weather) and:	movies (rainy, winter weather) indoor sports (summer)
Nightclubs and:	outdoor sports (fall, spring) indoor sports (winter, spring) recreational areas (spring, summer)
Outdoor and indoor sporting events (all seasons) and:	outdoor and indoor sporting events (all seasons) recreational areas (all seasons) concerts/cultural events
Outdoor sporting events (spring) and:	visiting friends/relatives at their residence
Recreational areas (all seasons) and:	recreational areas (all season)
Housework/home maintenance (WD) and:	housework/home maintenance (WE) personal hygiene/dressing (WD/WE) movies (rainy, wintry weather)
Housework/home maintenance (WE) and:	meal preparation/consumption (WD) personal hygiene/dressing (WD/WE) watching television (WD)

Table 3: Continued

Related Activities

Meal preparation/consumption (WD) and:	meal preparation/consumption (WE) personal hygiene/dressing (WD/WE) work/school related activities (WD)
Meal preparation/consumption (WE) and:	work/school related activities (WD) personal hygiene/dressing (WE)
Work/school related activities (WD) and:	work/school related activities (WE) personal hygiene/dressing (WD) visiting with family/roommates (WE)
Personal hygiene/dressing (WD) and:	personal hygiene/dressing (WE) laundry (WE)
Sleeping (WE) and:	in transit for activities other than work/school in transit to an from usual (overnight) destination personal hygiene/dressing (WD/WE) housework/home maintenance restaurants recreational areas (fall, spring, summer)
In transit for activities other than work/school and:	in transit for work/school recreational areas (fall, spring, summer)

Table 3: Continued

Related Activities

Community/civic activities and:	concerts/cultural events
Visiting friends/relatives at their residence and:	recreational areas (summer)
Days out of town on an overnight trip and:	movies (rainy, wintry weather)

Substitutes

Although only a small number were found, the substitutes identified in this study represented logical relationships concerning trade-offs in the students' time budgets. The following is a discussion of some of these substitutive activities.

Doing laundry during the week was substitutive for doing laundry during the weekend. This finding suggests a person will work on their laundry during the week in order to have more free time on the weekend. Or, conversely, a person will avoid doing laundry during the week and therefore must allocate that nondiscretionary time to the weekend.

Work and school related activities on weekend days were substitutive for sleeping during the entire week. This finding is a classic example of the substitutability concept; the more work a person does, the less time there is available for sleeping.

Another sound example of substitutes is attending church and going to nightclubs. The more time that is allocated to attending church, the less time a person elects for going out to nightclubs. Of course the relationship is more emphatic when the converse is true.

Work and school related activities were substitutes for watching television. This relationship makes sense in

that the more work and schoolwork a person has to do, the less time he has to watch television.

Complements

The following is a discussion of some of the complements found. It should be noted that researcher judgement was used to distinguish between a set of complementary activities and a set of related activities.

Visiting with family members and roommates was complementary to entertaining guests, watching television, and listening to music. In other words, while visiting with others, activities which might be shared during the visit include watching a television program or listening to the radio.

Housework and home maintenance were complementary to doing other household chores such as meal preparation and laundry. This finding suggests a person will combine similar activities in order to save time. Housework and home maintenance were also complementary to watching television. This result implies that the television is often on while a person is cleaning house, perhaps to make the work go faster.

Meal preparation and consumption were complementary to visiting family members and roommates and to entertaining guests. This finding is logical in that

having family members or friends to dinner is a customary event.

Work and school related activities were complementary to listening to music. This result suggests that many students have the radio or stereo turned on while working or studying, perhaps as a source of "white noise."

Related Activities

Many of the positively correlated activities were considered related rather than complementary. The following is a discussion of some of the related activities found.

Leisure reading was related to attending concerts and cultural events. This finding suggests that a literary person will also be interested in cultural activities, which is a logical relationship.

Eating at restaurants was related to spending time at recreational areas throughout the year. This relationship is logical in that people often eat out when they are away from home (unless they take food with them).

All sporting events, regardless of season, were related to all other sporting events. This finding is logical due to the fact that sports enthusiasts enjoy a wide variety of spectator sports.

Community and civic activities were related to leisure reading and concerts and cultural events. This

finding is logical in that people who are involved in the community also tend to be interested in keeping up with current literature and news as well as in supporting cultural events.

Sleeping on the weekend was related to watching television on the weekend. This suggests that a person who has more (less) time to sleep also has more (less) time to watch television.

Other Relationships

Other relationships which were found that did not represent substitutes or complements within the two dichotomies are worth mentioning for theoretical reasons.

For students who work, work and school related activities are substitutes for sleeping whereas for students who don't work, these two activities are unrelated. This finding illustrates the fact that working students have less available free time than do nonworking students, and therefore must sometimes substitute work for sleeping in their time budgets in order to accomplish necessary tasks.

For students who work, personal hygiene and getting dressed is a substitute for leisure reading while it is related to leisure reading for nonworking students. This is another example of how working students have a more constrained time budget. The more time a working student

spends on personal grooming, the less time he or she has to spend leisure reading. A nonworking student who has more free time available can spend more time on such activities.

CONCLUSION

The data set was considered to possess criterion group validity. The hypothesis that women spend more time on personal care and household chores appears to be true. The hypothesis that working students spend less time on discretionary activities than do nonworking students was also supported. It was found that working students not only allocate less time to discretionary activities, they also allocate less time to nondiscretionary activities. This finding reflects the fact that an employed student has more constraints on his or her time budget than do unemployed students.

The results of the bivariate correlations showed a high percentage of complements and related activities, and a small percentage of substitutes. Upon comparing the subgroups formed by the two dichotomies of male/female and work/don't work, a fairly consistent pattern of time use resulted. Therefore, the hypothesis that demographic variables would have an effect on time allocation did not hold true in this study. However, it is believed that further research would prove the hypothesis true. Due to the consistently large occurrences of complements and the logical relationships therein, this study suggests some validity to the existence of complements based on time allocation. Also, although only a small number of

substitutes were found, the resulting relationships proved logical and therefore lend evidence to the existence of substitutes based on time allocation.

Limitations and Implications

The findings of this study are limited in that they cannot be projected to a much large population. However, the purpose was to provide evidence of the existence of complementary and substitutive activities, not to provide a list of complementary and substitutive activities common to all people. Another limitation of this study is that researcher judgement was used concerning the identification of complementary and related activities. However, the methodology and analysis used were considered to have the least limitations among the available alternatives.

The findings imply that further research into this area would prove to be fruitful and interesting. If the concepts can be refined further, the results would prove quite helpful to researchers and practicing marketers alike. As mentioned earlier in this paper, much work is needed in researching concepts involved in consumer time allocation. Further research concerning complementarity and substitutability would add to the framework of concepts already forming in this area of consumer behavior. For marketers in the field, these concepts could prove quite useful in the areas of advertising,

market segmentation, new product development, and demand estimation.

Concerning this particular study, additional analysis should be performed with respect to normalizing the data (adjusting for overestimations and underestimations of time use made by the respondents). It is speculated that the results would show less positively correlated activities and more negatively correlated activities.

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Appendix A - Questionnaire

TIME USE QUESTIONNAIRE

Instructions: We are interested in how you spend your time. Below are a number of activities and responsibilities where you are likely to spend a portion of your time. Please estimate the amount of time you spend in each of the items mentioned. Your anonymity is assured; we are interested in how people in general use the time allotted to them.

1. Do you work and/or attend school? Yes No (If no, proceed to question 2.)

a. If you work, what type of work? _____

b. How many hours per week do you spend at work and/or school? _____

c. How much of the total time is spent

alone _____ %

interacting with co-workers
and/or fellow students _____ %

interacting with your superior
and/or teachers _____ %

interacting with customers (if
you work) _____ %

100 %

2. For the activities and duties which occur at home, indicate the amount of time you spend per day on the average on a weekday and then on a weekend day for each of the ones listed below.

	Average Number of Hours Spent (use fractions if necessary)	
	On Weekdays	On Weekend Days
housework, home maintenance	_____	_____
meal preparation and consumption	_____	_____
personal hygiene and getting dressed	_____	_____
laundry	_____	_____
work or school related activities	_____	_____
visiting with family/roommates	_____	_____
entertaining guests	_____	_____
watching television	_____	_____
listening to music	_____	_____
leisure reading	_____	_____
sleeping	_____	_____

3. For the activities and duties which occur away from home that are listed below, indicate the amount of time you spend per week on the average on each activity. If you do not engage in the activity at all, put a 0 in the appropriate space.

Average Number of Hours Spent Per Week
(use fractions if necessary)

- at church _____
- at community and civic activities _____
- at restaurants _____
- at movie theaters during warm, sunny weather _____
- at movie theaters during rainy or wintry weather _____
- at nightclubs _____
- at outdoor sporting events in the Fall _____
- in Winter _____
- in the Spring _____
- in the Summer _____
- at indoor sporting events in the Fall _____
- in Winter _____
- in the Spring _____
- in the Summer _____
- at concerts and cultural events _____
- shopping _____
- visiting friends or relatives at their residence _____
- at recreational areas (parks, lake, beach, etc.) _____
- in the Fall _____
- in Winter _____
- in the Spring _____
- in the Summer _____
- in transit to and from work and/or school _____
- in transit for other activities _____

4. During an average month, how many days are you out of town on an overnight trip? (a complete weekend = 2 days)

What is the approximate amount of that total time (in hours) is spent traveling to and from your usual destination? (leave blank if you have no usual destination)

5. If you found yourself with four hours of free time with absolutely no commitments or responsibilities, how would you spend it (given your present financial constraints)? Indicate the activities and the percentage of the four hours you would allocate to each activity. Use as many spaces as needed

1.	_____	_____ %
2.	_____	_____ %
3.	_____	_____ %
4.	_____	_____ %
5.	_____	_____ %

100 %

6. If you found yourself with an entire weekend with absolutely no commitments or responsibilities, how would you spend it (given your present financial constraints)? Indicate the activities and the percentage of the weekend you would devote to each activity. Use as many spaces below as needed. Be specific.

1.	_____	_____ %
2.	_____	_____ %
3.	_____	_____ %
4.	_____	_____ %
5.	_____	_____ %
6.	_____	_____ %
7.	_____	_____ %
8.	_____	_____ %
9.	_____	_____ %
10.	_____	_____ %

100 %

7. Please indicate your sex: Male Female

Appendix B - Bivariate Correlation Matrices

Key to Appendix B

Superscript meanings:

- a - average number of hours spent per day on activity
- b - average number of hours spent per week on activity
- c - days per month spent on activity
- d - number of hours spent on activity

Abbreviations:

- WD - weekday
- WE - weekend day

WORK/DON'T WORK: WITHIN NONDISCRETIONARY ACTIVITIES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
HOUSEWORK/HOME	1.0/1.0												
MAINTENANCE ^a	.45/.55	1.0/1.0											
MEAL PREPARATION/	.11/.33	.16/.20	1.0/1.0										
CONSUMPTION ^a	.01/.25	.22/.38	.56/.73	1.0/1.0									
PERSONAL HYGIENE/	.19/.26	.25/.18	.23/.41	.08/.34	1.0/1.0								
DRESSING ^a	.33/.19	.22/.15	.27/.39	.17/.37	.65/.84	1.0/1.0							
LAUNDRY ^a	.31/.23	.16/.11	.09/.05	.01/.01	.19/.15	.31/.10	1.0/1.0						
DRESSING ^a	.04/.08	.22/.22	.01/.07	.05/.13	.17/.15	.10/.18	-.17/-.22	1.0/1.0					
WORK/SCHOOL ACTIVITIES ^a	-.03/.05	.02/.10	.12/.26	.11/.33	.15/.17	.02/.18	.07/-.05	-.08/.11	1.0/1.0				
DRESSING ^a	-.05/-.07	-.09/-.07	-.05/.19	-.10/.20	.02/.18	-.03/.20	.10/.00	-.03/.05	.42/.50	1.0/1.0			
SLEEPING ^a	.11/-.04	-.03/.05	.01/.10	-.02/.12	-.07/-.05	-.14/-.03	-.19/-.12	-.10/.15	-.02/.00	-.23/-.14	1.0/1.0		
IN TRANSIT TO & FROM WORK/SCHOOL ^b	-.16/-.09	.01/-.14	.08/.00	.12/.05	-.05/-.14	-.09/-.11	-.07/-.02	.00/.13	-.05/.10	-.34/.02	.40/.37	1.0/1.0	
SLEEPING ^a	.13/.06	.11/.05	.04/.00	.02/-.04	-.03/.27	.05/.19	.01/.13	-.01/-.06	.08/.04	-.01/.05	.04/-.13	.03/-.16	1.0/1.0

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13)

p < .10: .11/.09 < r < .14/.12 p < .01: .19/.16 < r < .26/.20 146 / 210 ≤ n ≤ 147 / 213

p < .05: .14/.12 < r < .19/.16 p < .001: r > .26/.20

MALE/FEMALE: WITHIN NONDISCRETIONARY ACTIVITIES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
HOUSEWORK/HOME	1.0/1.0												
MAINTENANCE ^a	.39/.61	1.0/1.0											
MEAL PREPARATION/	.22/.31	.09/.23	1.0/1.0										
CONSUMPTION ^a	.07/.25	.33/.29	.56/.75	1.0/1.0									
PERSONAL HYGIENE/	.10/.25	.13/.20	.31/.47	.09/.41	1.0/1.0								
DRESSING ^a	.01/.27	.05/.21	.26/.44	.07/.47	.75/.72	1.0/1.0							
LAUNDRY ^a	.19/.26	.14/.11	.12/.04	.05/-.01	.08/.15	.05/.17	1.0/1.0						
WORK/SCHOOL ACTIVITIES ^a	-.03/.06	.15/.26	.05/.04	.09/.11	.17/.02	.19/.02	-.11/-.31	1.0/1.0					
SLEEPING ^a	.02/.04	.12/.05	.14/.21	.21/.26	.13/.22	.08/.17	.05/-.05	.03/.04	1.0/1.0				
IN TRANSIT TO & FROM	-.03/-.10	-.05/-.08	.06/.05	-.02/.12	.08/.06	-.02/.08	-.02/.04	.02/-.01	.41/.54	1.0/1.0			
WORK/SCHOOL ^b	.13/-.06	.07/-.03	.10/.06	.11/.04	.07/-.11	-.01/-.10	-.09/-.17	-.01/.11	.05/-.08	-.22/-.16	1.0/1.0		
SLEEPING ^a	-.09/-.11	-.16/.00	.18/-.07	.13/.03	-.06/-.10	-.04/-.11	-.09/.01	.05/.12	.03/-.01	-.22/-.14	.40/.38	1.0/1.0	
IN TRANSIT TO & FROM	.02/.08	.01/.11	-.04/.02	-.08/.00	.00/.23	.04/.15	-.03/.13	-.05/-.07	.08/.07	.09/.01	.00/-.12	-.02/-.15	1.0/1.0

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13)

p < .10: .10/.10 < r < .13/.12 p < .01: .18/.17 < r < .24/.22 161/191 ≤ n ≤ 162/193

p < .05: .13/.12 < r < .18/.17 p < .001: r > .24/.22

WORK/DON'T WORK: WITHIN INDIVIDUALLY SPECIFIC ACTIVITIES

6

AT CHURCH ^b	(1)	1.0/1.0				
AT COMMUNITY & CIVIC ACTIVITIES ^b	(2)	.44/.10	1.0/1.0			
SHOPPING ^b	(3)	.09/- .11	-.06/- .07	1.0/1.0		
VISITING FRIENDS/ RELATIVES AT THEIR HOME ^b	(4)	-.01/- .15	.06/.04	.12/.13	1.0/1.0	
IN TRANSIT FOR OTHER ACTIVITIES ^b	(5)	.11/- .05	.03/.01	.29/.35	.11/.04	1.0/1.0
DAYS OUT OF TOWN ON OVERNIGHT TRIP ^c	(6)	.09/- .08	.16/.00	.03/.16	.29/.09	.20/.18 1.0/1.0
TIME TRAVELING TO & FROM USUAL DESTINATION ^d	(7)	-.05/.15	-.04/.13	.15/.16	.12/.01	.01/.14 .15/.17 1.0/1.0

(1) (2) (3) (4) (5) (6) (7)

p < .10: .11/.09 < r < .14/.12 p < .01: .19/.16 < r < .26/.20
 p < .05: .14/.12 < r < .19/.16 p < .001: r > .26/.20

145/206 ≤ n ≤ 147/211

MALE/FEMALE: WITHIN INDIVIDUALLY SPECIFIC ACTIVITIES

AT CHURCH ^b	(1)	1.0/1.0				
AT COMMUNITY & CIVIC ACTIVITIES ^b	(2)	.34/.05	1.0/1.0			
SHOPPING ^b	(3)	.10/- .08	-.15/- .04	1.0/1.0		
VISITING FRIENDS/ RELATIVES AT THEIR HOME ^b	(4)	-.07/- .08	.01/.06	.13/.10	1.0/1.0	
IN TRANSIT FOR OTHER ACTIVITIES ^b	(5)	.11/.01	.04/.00	.27/.36	.02/.08	1.0/1.0
DAYS OUT OF TOWN ON OVERNIGHT TRIP ^c	(6)	.07/- .06	.02/.09	.03/.18	.08/.21	.14/.19
TIME TRAVELING TO & FROM USUAL DESTINATION ^d	(7)	-.04/.15	-.11/.21	.07/.16	.04/.04	.03/.10
	(1)	(2)	(3)	(4)	(5)	(6)
	(7)					

p < .10: .10/.10 < r < .13/.12 p < .01: .18/.17 < r < .24/.22
 p < .05: .13/.12 < r < .18/.17 p < .001: r > .24/.22

WORK/DON'T WORK: DISCRETIONARY VS. NONDISCRETIONARY ACTIVITIES

	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE
	HOUSEWORK/ HOME MAINTENANCE ^a	HOUSEWORK/ HOME MAINTENANCE ^a	MEAL PREPARATION/ CONSUMPTION ^a	MEAL PREPARATION/ CONSUMPTION ^a	PERSONAL HYGIENE/ DRESSING ^a	PERSONAL HYGIENE/ DRESSING ^a	LAUNDRY ^a	LAUNDRY ^a	WORK/ SCHOOL ACTIVITIES ^a	WORK/ SCHOOL ACTIVITIES ^a	SLEEPING ^a	SLEEPING ^a	IN TRANSIT WORK/SCHOOL ^b	IN TRANSIT WORK/SCHOOL ^b												
Visiting with family/ roommates ^a	.03/.10	-.09/.27	.28/.25	.07/.22	.24/.23	.12/.19	-.06/.14	.01/.04	.00/.19	-.15/-.01	.22/.06	.20/.01	.08/.14													
Entertaining guests ^a	.04/.21	.06/.31	.15/.17	.08/.22	.26/.20	.08/.17	-.10/.13	-.02/.07	.22/.21	-.18/.03	.32/.02	.17/.08	.07/.13													
Watching television ^a	.11/.14	-.01/.18	-.01/.22	.01/.12	.03/.27	.12/.20	.04/.10	.23/-.03	-.09/-.07	.08/-.08	-.04/-.05	.01/-.25	.07/-.07													
Listening to music ^a	.08/.23	.12/.26	.09/.45	.30/.43	.18/.33	.20/.31	.03/.02	.09/.16	.04/.15	-.02/.07	-.01/.08	.04/-.05	.01/-.03													
Leisure reading ^a	-.04/.24	-.08/.28	.00/.05	-.14/-.06	-.12/.06	.01/.03	-.14/.25	-.05/-.05	-.15/-.21	-.13/-.19	.20/.07	.14/.01	-.02/.06													
Restaurants ^b	-.10/.35	.10/.29	-.01/.13	.02/.20	-.07/.05	-.03/.06	-.13/.21	.10/.03	-.09/-.02	-.26/-.05	.13/-.09	.26/.09	.10/.02													
Movies (warm, sunny) ^b	.01/.00	.00/.11	.22/-.01	.10/.09	.25/.08	.18/.21	.06/.03	-.04/.09	.10/.13	.26/.09	.00/-.11	-.09/.07	-.15/-.06													
Movies (rainy, wintry) ^b	.03/-.04	.08/.02	.10/-.03	.15/.05	.16/.04	.20/.06	.07/-.02	-.03/.13	.04/.08	.16/.15	-.05/.12	-.04/.12	-.03/-.08													
Nightclubs ^b	-.01/.22	-.09/.30	-.01/.04	.02/.14	-.24/.18	-.18/.20	-.02/.24	.12/-.12	-.11/.22	.01/.05	.05/-.04	.06/-.11	-.04/.37													
Outdoor sporting events ^b :	-.06/.11	.00/.12	.00/.05	.01/.12	.06/.05	-.05/.08	-.05/.10	.24/.05	-.09/-.06	-.14/.152	.03/-.10	.08/.08	.04/.04													
Fall	-.10/.03	.18/.04	.17/.07	.07/.11	.08/.12	-.01/.16	-.04/.08	-.15/-.01	.03/-.08	.02/.05	.06/-.01	.03/.02	-.01/-.04													
Winter	.03/.01	.04/-.08	.04/.12	-.08/.03	-.02/.05	.06/-.01	-.08/.08	.02/-.03	-.06/-.04	.01/.06	.09/.01	.04/.19	-.13/-.08													
Spring	.18/.13	.01/.11	.09/.10	-.03/.10	.09/.22	.14/.19	.05/.10	.12/.04	.01/-.06	.03/.05	-.02/-.07	-.03/-.03	-.15/.22													
Summer	-.07/.12	-.20/-.10	-.06/.01	.05/-.05	.00/.01	.02/.07	.06/.08	-.03/-.11	-.02/-.19	-.01/-.05	-.15/-.11	-.10/-.07	-.18/.01													
Indoor sporting events ^b :	.15/.04	-.04/-.02	-.06/-.01	.00/.01	.03/.14	.09/.08	.00/.05	.03/-.04	.01/.11	.01/.10	.16/-.16	-.25/-.21	-.04/.31													
Fall	.23/-.01	.01/-.04	-.05/-.04	-.04/-.01	.04/.00	.10/.00	.09/.07	-.01/-.22	-.10/.00	.03/.05	.06/-.20	-.29/-.15	-.01/.06													
Winter	.24/-.01	.04/-.09	-.12/.01	-.12/-.01	.05/.01	.11/.00	.06/.04	.08/-.18	-.02/-.10	.10/-.01	.07/-.13	-.23/-.08	.02/-.02													
Spring	.21/.03	.07/.01	-.07/.01	-.11/.04	.10/.03	.15/.00	.11/.07	.05/-.07	.04/-.04	.09/.01	.03/-.10	-.17/-.04	.03/-.01													
Summer	.37/.00	.08/.02	-.08/-.06	-.08/-.05	-.03/-.08	.13/-.08	.18/.01	.05/-.13	-.08/-.17	.04/-.03	.07/-.07	-.25/-.04	.08/.00													
Recreational areas ^b :	.24/-.09	-.06/.00	-.09/-.08	-.06/-.02	-.01/-.08	.08/-.07	.18/.01	.05/-.18	.02/-.09	.13/-.01	.06/-.13	-.25/-.03	.11/.02													
Fall	.18/.00	.04/.09	-.03/-.03	-.07/-.02	.02/-.06	.15/-.07	.14/.06	.07/-.17	-.05/-.07	.06/.02	-.05/-.11	-.26/-.05	.12/.01													
Winter	.27/.01	.11/.01	-.11/-.05	-.12/-.09	-.07/-.10	.10/-.12	.19/.02	.05/-.12	-.04/-.18	.02/-.04	.02/-.06	-.22/.02	.07/-.01													
Spring	.01/.14	.05/.04	.06/.06	-.04/.11	-.08/.11	-.04/-.01	.00/.02	.11/-.04	.10/.08	.12/.03	-.14/-.06	-.19/.08	.03/-.04													
Summer	.17/-.02	.24/.06	.05/.00	.13/.01	-.02/.08	-.03/.09	-.01/.04	-.17/-.03	.07/-.05	.02/-.01	.20/.04	.05/-.02	.10/.01													
Recreational areas ^b :	.23/-.03	.13/-.01	-.08/.07	.06/.11	-.10/.00	-.02/.04	.07/.14	-.08/-.14	-.02/.09	.07/-.01	.04/.03	.04/.10	.12/.06													
Fall	.25/-.04	.29/.08	-.03/.01	.06/.02	.01/.06	.06/.09	.08/.02	-.11/-.02	.02/-.03	.09/-.01	.13/.03	-.02/-.01	.11/.08													
Winter	.12/-.08	.18/.04	.08/-.02	.10/.01	.03/.08	.05/.12	.01/.07	-.08/-.01	.11/-.04	.11/.02	.12/-.02	-.05/-.04	.19/.06													

WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE	WD	WE
HOUSEWORK/ HOME MAINTENANCE ^a	HOUSEWORK/ HOME MAINTENANCE ^a	MEAL PREPARATION/ CONSUMPTION ^a	MEAL PREPARATION/ CONSUMPTION ^a	PERSONAL HYGIENE/ DRESSING ^a	PERSONAL HYGIENE/ DRESSING ^a	LAUNDRY ^a	LAUNDRY ^a	WORK/ SCHOOL ACTIVITIES ^a	WORK/ SCHOOL ACTIVITIES ^a	SLEEPING ^a	SLEEPING ^a	IN TRANSIT WORK/SCHOOL ^b	IN TRANSIT WORK/SCHOOL ^b												
p < .10 :	.11/.09	p < .10 :	.14/.12	p < .01 :	.19/.16	p < .26/.20																			
p < .05 :	.14/.12	p < .05 :	.19/.16	p < .001 :	r > .26/.20																				

WORK/DON'T WORK: NONDISCRETIONARY VS. INDIVIDUALLY SPECIFIC ACTIVITIES

HOUSEWORK/HOME	WD	.00/-02	.01/.02	.11/.16	.09/-01	.13/.08	.05/.07	.02/.00
MAINTENANCE ^a	WE	.05/-04	.04/-03	.20/.13	.10/.01	.25/.03	-.01/.00	-.06/.08
MEAL PREPARATION/ CONSUMPTION ^a	WD	.10/-01	.02/.01	.16/.03	.23/-03	.14/.06	.01/.06	.12/-04
PERSONAL HYGIENE/ DRESSING ^a	WE	.01/.02	-.02/.11	.03/-02	.20/.06	.04/.09	.01/-03	.06/-02
LAUNDRY ^a	WD	.01/.07	.00/.07	.13/.36	.01/.02	.11/.14	.11/.14	.20/.09
	WE	.05/.10	.10/.07	.10/.34	.02/.05	.13/.16	.06/.08	.07/.08
	WD	.01/.02	.06/.00	.00/.29	.07/-04	.09/.11	.08/.00	-.12/-04
	WE	-.06/-06	-.07/-11	-.01/.06	.06/-06	-.04/-12	-.04/-14	-.03/-01
WORK/SCHOOL ACTIVITIES ^a	WD	.07/.18	-.09/.16	.02/-02	.00/.02	.12/-02	.11/-03	.04/.03
	WE	.14/.07	.00/.10	.09/.03	.00/.07	-.03/.06	.07/-09	-.02/-09
SLEEPING ^a	WD	.03/.03	-.04/-10	.15/-13	.03/.03	-.02/.01	.06/-11	.12/-08
	WE	-.06/-01	-.17/-07	.05/-08	-.01/.00	-.06/-07	-.16/-16	.00/-15
IN TRANSIT TO & FROM WORK/SCHOOL ^b		.02/-10	.04/-06	.05/.64	.28/.06	.37/.50	.17/.12	-.04/.11

CHURCH ^b	COMMUNITY SHOPPING ^b	VISITING FRIENDS/ RELATIVES AT THEIR HOME ^b	IN TRANSIT FOR OTHER ACTIVITIES ^b	DAYS OUT OF TOWN OVERNIGHT TRIP ^c	TRAVEL TIME TO & FROM USUAL DESTINATION ^d
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p < .10: .11/.09 < r < .14/.12 p < .01: .19/.16 < r < .26/.20
 p < .05: .14/.12 < r < .19/.16 p < .001: r > .26/.20

145 / 204 ≤ n ≤ 147 / 211

MALE/FEMALE: NONDISCRETIONARY VS. INDIVIDUALLY SPECIFIC ACTIVITIES

HOUSEWORK/HOME	VD	-.01/.02	-.06/.08	.08/.13	-.02/.02	.03/.12	.06/.07	.02/-.02
MAINTENANCE ^a	VE	.06/-.05	-.09/.07	.17/.11	.01/.05	.06/.18	-.06/.03	.04/.01
MEAL PREPARATION/	VD	.07/.00	-.01/-.05	.13/.02	-.03/.08	.11/.08	-.05/.13	-.01/-.04
CONSUMPTION ^a	VE	.02/.00	-.01/.15	-.04/-.01	-.01/.18	.10/.06	-.08/.06	.01/.01
PERSONAL HYGIENE/	VD	.04/.09	-.03/.12	.18/.24	-.09/-.01	.08/.15	.05/.20	.07/.11
DRESSING ^a	VE	.10/.13	.01/.13	.25/.18	-.01/-.01	.13/.15	.08/.08	.06/.05
LAUNDRY ^a	VD	.02/.01	.04/.01	.02/.25	.00/-.02	.05/.12	-.06/.10	-.14/-.04
WORK/SCHOOL ACTIVITIES ^a	VE	-.08/-.01	-.12/-.08	.05/-.05	.10/-.09	-.09/-.09	-.02/-.15	-.06/-.03
SLEEPING ^a	VD	.13/.06	.17/-.03	.08/-.01	-.16/.10	.04/.08	-.10/.12	.06/.00
IN TRANSIT TO & FROM	VE	.22/-.05	.10/-.03	.12/.01	-.09/.09	.06/-.03	-.11/.04	-.13/-.07
WORK/SCHOOL ^b	VD	.03/.00	-.02/-.13	.10/-.10	.05/.02	.11/-.07	-.09/.00	.06/-.04
TRIP ^c	VE	-.09/.04	-.02/-.15	-.04/-.02	.03/-.01	-.01/-.10	-.14/-.16	-.07/-.09
USUAL	VD	.01/-.08	-.02/-.05	.03/.64	.02/.14	.26/.52	.01/.19	-.06/.09
DESTINATION ^d	VE							

CHURCH^b COMMUNITY SHOPPING^b VISITING IN TRANSIT DAYS OUT TRAVEL TIME
 & CIVIC^b & CIVIC^b FRIENDS/ FOR OTHER OF TOWN TO & FROM
 RELATIVES ACTIVITIES^b OVERNIGHT USUAL
 AT THEIR TRIP^c DESTINATION^d
 HOME^b

p < .10: .10/.10 < r < .13/.12 p < .01: .18/.17 < r < .24/.22
 p < .05: .13/.12 < r < .18/.17 p < .001: r > .24/.22

157/189 ≤ n ≤ 162/192