

THE EFFECTS OF SOCIAL ENVIRONMENTS
ON SOLITARY BEHAVIOR

by

SCOTT MAXAM MEIS

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Department of ANTHROPOLOGY AND SOCIOLOGY

The University of British Columbia
Vancouver 8, Canada

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ABSTRACT

Two contradictory social psychological models of human sociability exist in the social science literature: a steady state model, and a homeostatic model. In this thesis a model of possible environmental effects on individual solitary behavior is developed to test these underlying social psychological models.

These models are tested in a secondary analysis of activity log data of a sample of industrial workers.

The results indicate that two causal processes interact in producing differences in the amounts of time people spend alone. In one process, temporal constraints on the number of persons and the amount of time available for non-work social interactions facilitate solitary behavior on workdays. These direct effects carry over into the weekend when the constraints of work hours are not directly present. In the other process people compensate for extremes in their social experience at work by participating more in discretionary solitary activities. When combined, these two isolating processes produce an even stronger interaction effect.

These observations support the homeostatic model of human sociability. Suggestions are then made for a more sophisticated future testing of these models.

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CHAPTER I

INTRODUCTION

THE THEORETICAL CONTEXT

To date the sociological literature has taken a very atomistic approach to the subject of social participation. Studies have concentrated on the variation in rates of participation in particular contexts of social activity. Some examples are studies of participation in social organizations (Scott, 1959; Wright, 1958; Komarovsky, 1946; Hausknecht, 1962; Blakelock, 1967), family units (Bott, 1957; Dotson, 1951; Mogeey, 1956) and informal and kin networks (Bott, 1957). Studying social participation in this atomistic way creates a problem. It gives no clear picture of the individual variation existing in overall levels of social interaction. No one has examined, as yet, the individual variation in social activities in toto. This oversight, in particular, and the atomistic approach to the subject, in general, are consequences of a particular implicit model of human social behavior. The basic assumption of this model is that humans are gregarious by nature. In other words, it assumes that sociability is a constant and universal human need.

To justify this model, experimental psychologists argue that social interaction is a principle source of stimulation and feedback

to individuals of the species. Therefore it is necessary to their development and survival (Ainsworth, 1964; Freedman, 1964; Flavell, 1968). Research findings on the effects of extreme social isolation support this assertion of a need for some minimal level of social stimulation (Soloman, 1963), and lend credibility to this model of human sociability.

However, empirical evidence also exists that contradicts other implications of this model. One such contradiction is that the model implies that solitary activity is an unnecessary and uncommon aspect of human daily behavior; whereas Berger and Sorokin (1939) found that everyone experiences at least some isolation as a part of their normal daily life. Specifically, they found that 31 per cent of people's daily activities were carried out alone. Some writers, who have been concerned with the importance of this daily solitude, suggest that it too is necessary to the health of individuals (Plant, 1930; Chapin, 1951). This argument has received indirect support from the empirical findings of Calhoun (1962) and Christian (1963) that extreme crowding produces pathological changes in the social behavior and physiology of rats. Analogous studies of human reactions to the stresses of other kinds of sensory overloads have produced changes in their social behavior also (Selye, 1959; Ruff, 1963). These observations support the notion that perhaps a better model of human sociability is that of a teleological system. This model is based on the following different assumptions about human social behavior. It assumes that people have similar maximum

and minimum tolerance limits to both social contact and isolation but that a considerable amount of individual variation is possible from day to day and from person to person within those extremes. It assumes secondly, that people choose their discretionary behavior so as to maintain some preference level or balance between social and solitary activities that they have developed from their past experience. It assumes, thirdly, that such a preference level will adjust to long term differences in nondiscretionary behavior.

One purpose of this investigation is to test these two models of human social and solitary behavior. A second purpose is to integrate some of the possible sources of individual variation that have been presented in the literature into a general theoretical framework. A third purpose is to test the utility of this framework in explaining individual differences in the amount of time people spend alone in a day.

THE PROBLEM

Specification of the Dependent Variable: Solitary Behavior

In the traditional sociological terminology, social action includes all action that is directed towards the immediate behavior of others or the anticipated behavior of others. In these terms other persons do not necessarily have to be co-present in order for a person to be engaged in social activity. On the other hand, although

other persons may be co-present; a given person's activity may be non-social if it is not directed towards the present or future activities of these or any others. Thus, the social or non-social character of people's activity can be described along two distinct dimensions: the context of the activity and the intentions of the actors. This investigation focusses on the first of these. One reason for this focus is the question that the research attempts to answer: do people react to variations in concrete social stimulation as if they were homeostatic systems? The phenomenon of concern in this question is concrete interactive behavior. It is assumed that this takes place at either a verbal or non-verbal level whenever people are physically proximate. Social behavior can then be defined as behavior in social contexts and conversely, non-social behavior can be defined as behavior when others are not physically co-present. A second reason for this emphasis is that the context of activities is the only one of the two dimensions that is directly recoverable in the data used in this analysis. These definitions, which describe only the observable nonsymbolic attributes of social activity, sharpen the focus of the analysis. The question to answer becomes: how much individual variation exists in the amount of time people spend alone or in the company of other persons. Since this question can be answered by examining either or both of these phenomena, this analysis focussed on the least complex and least researched of the two--solitary behavior.

Constructing a crucial test between two contradictory social psychological models of the human propensity to participate in this behavior is one of the stated goals of this investigation. Looking at whether people engage in solitary or interactive social behavior at times in the day when they have the maximum amount of personal discretion to do what they want is one way of testing these two models. In reviewing the literature one finds that both within and across cultures there is relatively little variation in the amount of time that people spend in the daily activities of work, work related activities, personal toilet, sleeping and eating (Szalai, et al., 1966; Chapin and Brail, 1969). These activities, which satisfy sustenance and physiological needs, are termed 'non-discretionary activities'. However, because of their greater variation, it is the rest of people's behaviors, their discretionary non-work activities, that are of particular interest in this investigation. Thus the problem is further restricted to an investigation of the sources of differences in people's daily discretionary solitary behavior.

A Theoretical Framework: The Importance of the Density of Persons in an Environment

Assuming for the moment that people do have an initial pre-disposition for social action, another basic assumption of sociology is that a common environment is the most elementary prerequisite of conjoint social action. Thus within any defined environmental set the number of other persons who share that set, their relative proximity, and the organization of their activities constitute the

physically determined potential social opportunity structure of that set for any given individual. The basic theoretical structure of the analysis consists of this conceptualization of the environment as an opportunity set and three different arguments suggesting how the distribution of aggregates within such environmental sets can cause individual differences in solitary behavior. The first argument hypothesizes an immediate negative effect of the density of persons in the environment. The second argument hypothesizes an indirect effect of the density of persons in antecedently experienced environments. And the third argument hypothesizes that individuals are differentially susceptible to such environmental effects.¹

The Immediate Effect of Social Density of Environments on Solitary Behavior

Many findings in the literature support the argument that, for aggregates sharing a common environment, the size, physical proximity and social proximity of the aggregate are all positively related to rates of social interaction (Simmel, 1902; Stouffer, et al., 1949; Alexander and Campbell, 1965; Menzel and Katz, 1966; Barker and Gump, 1964; Blake, et al., 1956; Ittleson, et al., 1970). One can argue, that the larger the opportunity is for social interaction, the smaller it is for solitary activity. If other persons sharing a common

¹These explanations all have the general form of cross level explanations which are referred to in the literature as compositional, contextual and structural effects. See the beginning of Chapter 2 for a discussion of some of the methodological implications of such explanations.

environment make demands on the individual to initiate and maintain social interaction then these demands restrict the individual's ability to engage in solitary activities. Furthermore, if no differences exist in the dispositions of the individuals in question then it can be assumed that the greater the opportunity for solitary behavior the more solitary activity individuals will experience. If this chain of inference is correct then one should find a negative relationship between density and solitary behavior. This relationship should exist in both spatially and temporally defined social contexts at many different levels of scale.



Fig. 1 The Relationship between Density and Solitary Behavior

Density of Spatial Contexts

The literature contains considerable evidence of the importance of the household, the neighbourhood, and the community as contexts of people's leisure social experience (De Grazia, 1962; Keller, 1964; Szalai, et al., 1966). Because people spend most of their discretionary time there, the household context is considered to be the most important of these. The contextual density argument, in general, and the importance of household density, in particular, are tested in the following hypothesis.

Hypothesis (1) The larger the number of persons in the household the smaller the amount of solitude individuals experience.

Studies such as those of Dotson (1951) and Young and Wilmott (1957) have demonstrated that the presence of other relatives in the community correlates with social participation in that context. The importance of this measure of contextual social density is tested with the next hypothesis.

Hypothesis (2) Persons with other relatives living in the region of the community spend less time in solitary activities than persons with no relatives living in the community.

Density of Temporal Contexts

Apart from these spatial units, Blakelock (1960) and Gray (1968) have stressed the importance of the temporal contexts of peoples' activities as a source of variation in their social behavior. The basic idea is that although other persons may spend much of their free time in the same spatial settings as a given individual it is possible that their timing is disparate to his.

In this explanation an urban community is seen as consisting of a large number of persons engaged in various activities at different points in time and space in carrying out their daily affairs. Sustain-
ance activities are assumed to be the most important of these. People's work activities in an urban community are seen to have highly specialized

functions. These people in turn depend upon others with similarly specialized work tasks to fulfill the remaining functions necessary for their sustenance. Thus all the members in an urban community have either direct or indirect links to each other through the functional interdependence of their work activities and sustenance needs. It is argued that people's work activities also determine the temporal relations between the members of an urban community. If examined for long periods of time, the sequences of activities are seen to reoccur in natural cycles with stable time intervals. People's daily and weekly patterns of activity are two such natural cycles. For the majority of the adult population, work activity is the largest and least flexible block of nondiscretionary activity in these cycles. Because of its collective functional importance and its individual importance, the temporal structure of people's work determines the temporal structure of their nonwork activities. That is, the days of work, the daily times of work and the time spent at work determine the location of time and the amount of time available for people's nonwork activities.

Investigations of the orderings of people's activities in urban communities have revealed the existence of a modal pattern that (Seeley, et al., 1956) is characteristic of the majority of the adult population of the community. In most of urban North America it consists of about eight hours of work from 8 a.m. to 5 p.m. daily with some sixteen hours a day left for rest, personal care and participation in discretionary activities. This nonwork time is usually structured so

that the early evening hours are spent in discretionary activities and the later hours are spent in sleep until people rise the next morning to reinitiate the cycle. This daily modal pattern is nested within a weekly modal cycle consisting of five or six workdays from Monday to Friday or Saturday; with one or two days off work, usually Saturday and Sunday. Again on these weekend days persons are relatively free to choose what they do and where they do it. Although the temporal ordering of the activities of some communities may differ from this pattern, (e.g., in a company town), it will be assumed that this pattern is characteristic of most urban communities. Persons whose schedules of work and free time are congruent with the majority pattern are referred to as temporally modal (Gray, 1968:3-8).

However, for reasons of profit, efficiency, and community necessity some organizations in the urban community maintain certain functions at different times or for longer time periods than the modal schedule. Thus the discretionary time periods of persons employed in such functions are incongruent with those of the majority of the community: they are described as temporally marginal (Gray, 1968:3-8).

In order to participate in direct social interaction with other persons, the temporal and spatial ordering of people's activities must be synchronized. Thus, the activities of most housewives become integrated into the temporally modal work pattern in the process of synchronizing their activities with the schedules of their employed husbands, their school-age children, and the hours of operation of retail stores and other commercial services of the urban community. On

the basis of this argument, Gray (1968) proposed that the greater the degree of temporal marginality of a person, as determined by the disparity between their work schedule and the modal schedule, then the fewer their opportunities for social interaction with the majority of the population of the community. Furthermore, the greater the temporal disparity between the work schedules of any two persons the fewer their opportunities for social interaction. Both Gray and Blakelock have found evidence in support of this argument in their studies of shift workers' social participation with family members and in voluntary organizations. By adding the assumption that the fewer the opportunities for social interaction the greater the opportunities for solitary behavior, several hypotheses can be made regarding the effects of temporal marginality on solitary behavior.

Hypothesis (3) Persons who work temporally marginal shifts will spend more of their nonwork time in solitary activities on workdays than persons who work temporally modal shifts.

Hypothesis (4) Persons whose days of work are temporally marginal will spend more time in solitary activities on their days off than persons whose days off are temporally modal.

To this point the argument of a temporal contextual effect treats the community as a whole as the relevant spatial social unit. However,

temporal constraints on social behavior within the household are also relevant (Gray, 1968; 100-105).

Temporal Incongruity within the Household

Assuming that the density of the household affects people's solitary behavior as hypothesized, then this relationship should be influenced by the likelihood that persons are in the same spatial context at the same time. Thus one can argue that the congruity of the time schedules of household members interacts with household density to restrict people's opportunities for solitary behavior. When children reach school age, they become integrated into the modal schedule and their free time schedules become fixed. This should reduce the amount of time marginal shift workers have available for interaction with their children on weekdays and increase their opportunities for solitary activities on those days. If this is true, then the following hypothesis will receive confirmation.

Hypothesis (5) Temporally marginal workers whose children are of school or working age will spend more time in solitary activities than temporally marginal workers whose children are not of school age.

Similarly, when wives take a job they lose their discretion over the scheduling of their free time. If their work schedules are incongruent with those of their husband's then this should reduce the opportunities for social interaction between them and increase the

opportunities for participation in solitary activities. Confirmation of the following hypothesis would support this reasoning.

Hypothesis (6) Workers whose shifts are incongruent with those of their employed wives will spend more time in solitary activities than workers whose shifts are congruent with those of their employed wives.

If differences in both the home and community environments produce contextual effects on solitude, then the combination of both temporal marginality and incongruity of work schedules should produce a stronger isolation effect. Confirmation of hypotheses 7 and 8 supports this elaboration.

Hypothesis (7) Of the workers who are temporally marginal those whose shifts are incongruent with their wives' schedules spend more time in solitary activities than those workers whose shifts are congruent with their wives' schedules.

Hypothesis (8) Of the workers who are modal, those whose shifts are incongruent spend more time alone than those whose shifts are congruent.

To summarize the first argument, it has been proposed that individual differences in the amount of time spent in discretionary solitary activities can be accounted for by differences in the number

of persons in the non-work contexts of the household and community, the number of persons with similar work schedules in these contexts, and the amount of free time that the individual has in common with those persons.

The Antecedent Effect of Social Contexts

This next argument proposes that the number of persons co-present in one environment can indirectly affect a person's behavior in later environments. Since Marx there has been a history of interest in this argument in the form of the effects of people's work experience on their non-work behavior. In a review of the literature concerning this relationship between work and leisure, Witt and Bishop (1970) documented five classical explanations: catharsis, compensation, surplus energy, relaxation, and task generalization. Each makes assumptions about certain fundamental human needs, and then explains people's motivation for particular discretionary activities in terms of their antecedent work situation and experiences. As a group these explanations can be thought of as 'temporally antecedent contextual effects'. They propose that differences in the temporally antecedent contexts produce differences in behavior which in turn produce differences in people's motivations and behavior at a later time. A model of this causal process is diagrammed in Figure 2. In the diagram, Z represents individual behavior at one point in time, T_1 , in response to the direct effect of the environmental condition, Y; X represents some endogenous individual behavior at a later point in

time, T_2 ; $Z \rightarrow X$ is an antecedent effect of behavior Z on behavior X; $Y \rightarrow Z$ is an immediate contextual effect; and $Y \rightarrow X$ is an indirect antecedent contextual effect that is suppressed when the relationships between Y and Z, and Z and X are jointly analyzed.

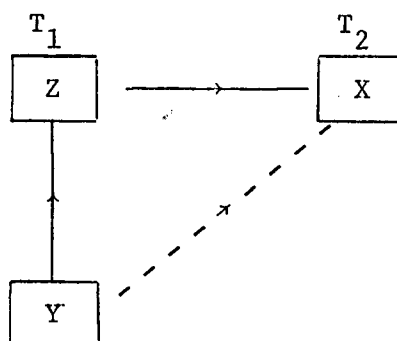


Fig. 2 The Structure of the Antecedent Contextual Effect

Wilensky (1960) has speculated that two of the five antecedent contextual explanations mentioned by Witt and Bishop--compensation and task generalization ("spill over" in Wilensky's terms)--are relevant to the relationship between social interaction at work and people's non-work social behavior.

The Compensatory Effect

Wilensky's compensatory argument can be interpreted as having two implicit assumptions: 1) people have differing but relatively stable preference levels for certain specific kinds of activity (social interaction in this instance); and 2) they have less discretion over their choice of job and their work behavior than their non-work behavior. It proposes that they attempt to compensate for stresses in their work experience in their non-work discretionary activities. If this argument

is valid, then the following hypothesis should be confirmed.

Hypothesis (9) People who are socially isolated at work will spend less time in solitary non-work activities on work-days than people who are not socially isolated at work.

The Carry-Over Effect

The carry-over argument states that the performance of different kinds of purposive activity, in this case social interaction, requires certain skills that are learned or maintained through previous experience. It assumes that the work experience is a major source of the learning or maintenance of these skills. If this argument is valid the following hypothesis should be confirmed.

Hypothesis (10) People who are socially isolated at work will spend more time in solitary activities in their non-work hours on workdays than people who are not socially isolated at work.

The Null Hypothesis

Meissner (1970) has added an elaboration to Wilensky's speculations. He argues that a third "null hypothesis" is also possible. The rationale of this third alternative rests on two assumptions: (1) that people are all equally gregarious and that (2) they daily perform different roles in different institutional settings that are causally independent of each other. The validity of this rationale is tested with the following hypothesis.

Hypothesis (11) The differences predicted in hypothesis (9) and (10) will be neither strong nor significant.

These three important possible antecedent effects can be further tested by examining the relationship between people's discretionary behavior after work on workdays and their behavior on weekends. If the earlier argument about the effects of temporal marginality on solitary behavior on workdays is true, then the same three possible antecedent effects should apply to people's weekend behavior. If the compensatory argument is applicable then:

Hypothesis (12) Of the persons who have both Saturday and Sunday off work, those working marginal shifts will spend less time in solitary activities on Saturdays and Sundays than those working modal shifts.

On the other hand, if the carry-over argument is true then:

Hypothesis (13) Of the persons who have both Saturday and Sunday off work, those working marginal shifts will spend more time in solitary activities on Saturdays and Sundays than those working modal shifts.

If neither of these arguments is true, then the null effect will be observable.

The importance of these three conflicting arguments relates directly back to the initial purposes of this investigation. They

provide a test of the two underlying models of human gregariousness. If the null effect hypotheses are confirmed then the assumption of constant gregariousness and its associated model of human social behavior receives support. If the compensatory hypotheses are confirmed then the model of human social behavior as a balancing system receives support. If, however, the carry-over hypotheses are confirmed then further theoretical elaboration is needed before one can ascertain the implications for the two general models of human disposition to social behavior. This is not yet a crucial test.

In their studies, Meissner and Gray reached conflicting conclusions regarding these three important hypotheses. Meissner found weak support for the carry-over explanation of the relationship between social interaction on and off the job. Gray, on the other hand, found evidence of a compensatory relationship between temporal marginality on weekdays and social participation with family members on weekends. These conflicting findings suggest that further theoretical elaboration is indeed necessary if one is to decide which of the two general social psychological models is correct. The weak point of both the carry-over and compensation arguments is that although a temporal sequence is central to each, they do not handle the implications of time as a variable in the two hypothesized processes. Specifically, two different temporal effects can be argued: 1) a temporal suppression effect, and 2) a temporal reinforcement effect.

Temporal Suppression of the Compensation Effect

The compensation argument, although it does not specify a relevant time period, implicitly involves some short term regular cycle over which the balancing mechanism operates. If one assumes first that the compensatory motivation decreases as a function of each additional compensatory act, and second that the opportunities for each compensatory behavior increase directly over time, then the compensation effect should decrease directly with the length of the intervening time period. A structural diagram of this 'short term compensation suppressor effect' is presented in Figure 3.

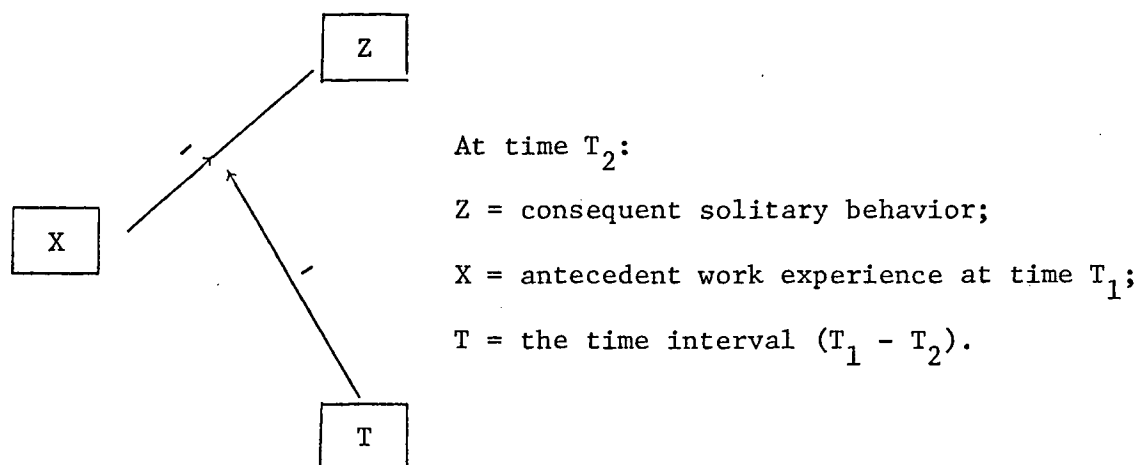


Fig. 3 The Short Term Temporal Suppression Effect

Hypotheses (14) and (15) test some of the specific implications of this effect.

Hypothesis (14) For those persons with both Saturday and Sunday off work, the differences between persons with different

levels of social experience at work will be less on Saturdays than during non-work periods on workdays.

Hypothesis (15) For those persons with both Saturday and Sunday off work, the differences between persons with different levels of social experience at work will be less on the second day off (Sunday) than on the first day off (Saturday).

Temporal Reinforcement of the Carry-Over Effect

In the carry-over explanation, time is implicitly treated differently. Here it acts as a reinforcing variable. This argument assumes that the social skills that are generalized for people's work experience improve with long-run experience. If both this and the earlier temporal marginality argument are valid, then this long term temporal effect can be tested with the following hypothesis.

Hypothesis (16) Persons who have been temporally marginal for several years or more will spend more time in solitary activities than those who have been temporally marginal for only a short time.

This causal model is similar to the last except that the sign of the temporal effect is reversed. It can be diagrammed as follows.

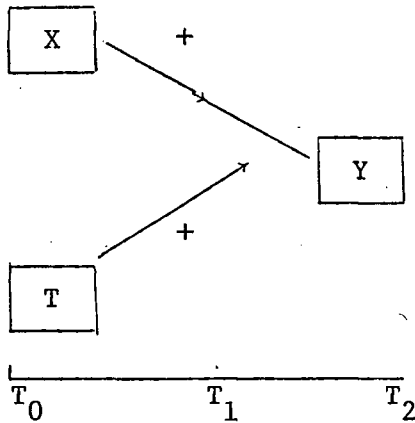


Fig. 4 The Long Term Temporal Reinforcement Effect

A further elaboration includes both of these temporal variables in the model at once. One then has a four variable system which posits conflicting temporal effects on the relationship between work and non-work social activity. The first is a long term generalization effect. The second is a short term compensation effect. This model can be diagrammed as follows.

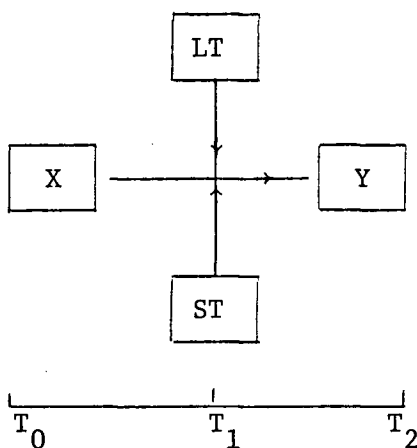


Fig. 5 The Combined Relationships of Antecedent Social Experience, Short Term Compensation, and Long Term Adaptation

In the diagram,

$T = T_1 - T_0$ (the length of time the antecedent effect has been experienced);

X = antecedent variable; and

Y = consequent variable

In the diagram,

X = antecedent social isolation at T_1 ;

Y = amount of solitary activity at T_2 ;

LT = length of time that X has been experienced ($T_1 - T_0$); and

ST = the time interval between the antecedent isolation and the compensatory behavior ($T_2 - T_1$).

If this is a valid representation of the causal process in question then when the effects of shift, time on shift, and time passed since the last workday are examined simultaneously hypotheses (16), (17), and (18) should be confirmed.

Hypothesis (17) When controlling for both length of time on shift and the day of the weekend, marginal workers should experience less solitude in all cells (compensation effect).

Hypothesis (18) The differences between marginal and modal shift-workers should be less on Sundays than on Saturdays (suppression effect).

This more elaborate model finally provides the crucial test of the two general social psychological models in question.

In the two contextual arguments outlined to this point a number of environmental variables have been hypothetically related to differences in the amount of solitude that people experience. However, Scheuch (1969) has cautioned that although people may have varying objective opportunity to participate in a given behavior they may also vary in the degree to which they are individually susceptible to that setting. This principle of differential individual susceptibility is the third type of environmental explanation, of individual differences in solitary behavior.

The Effects of Differential Individual
Susceptibility to Social Environments

This differential susceptibility to environmental structures can be explained by three arguments. The first is that individual differences in the perception of the environmental structures lead to differences in their utilization of common environmental sets. Second, individuals have varying other resources that are necessary in utilizing the environmental set held in common. Third, individuals might be differentially predisposed to utilize a given environmental structure.² This third possible explanation provides a way of integrating hypotheses of direct and antecedent contextual effects into a single theoretical system. In this system solitary behavior is a function of an interaction between present environmental structures and present dispositional states produced by past experience. With a further elaboration of including the two other differential individual susceptibility effects to common environmental structures the overall theoretical structure of environmental effects becomes completely integrated into one model.

²As a methodological note it is important to realize that these differential susceptibility arguments have the analytical form of interaction effects. That is, quite apart from any independent effect that they might have, the individual properties in question modify the effect of some other relationship.

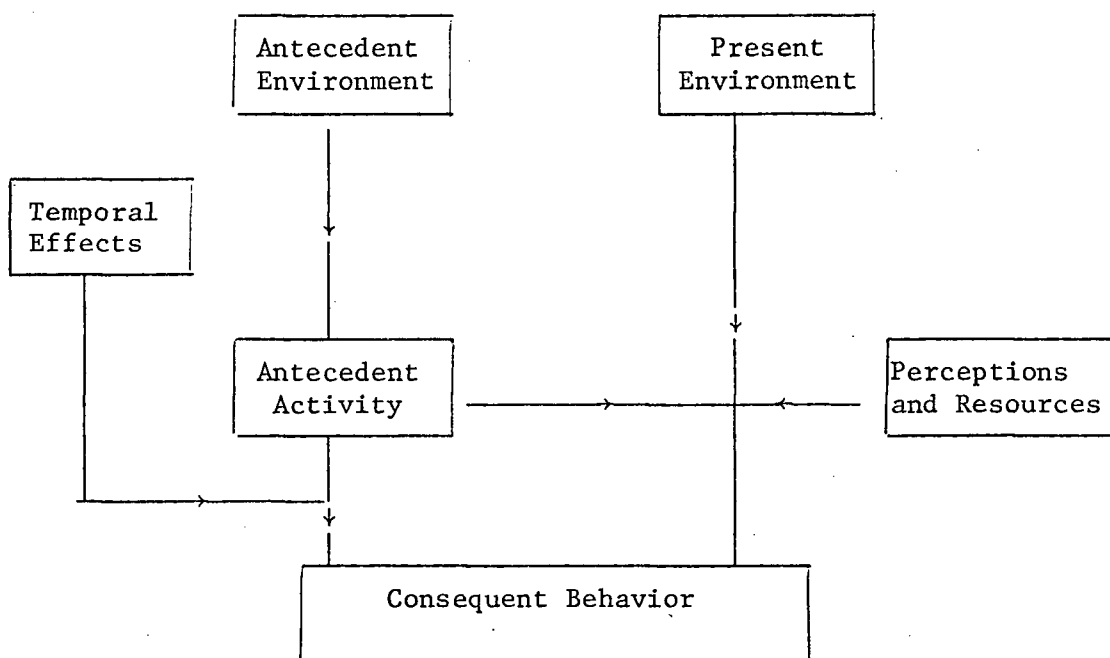


Fig. 6 The Integrated Theoretical System of Environmental Effects on Behavior

Confirmation of the following hypothesis would support this model and its parts: the arguments for a compensatory effect, a contextual density effect, and an interaction effect between these two.

Hypothesis (19) Persons who experience high levels of interaction at work and work marginal shifts will spend more time in solitary activities than if the effects of these were merely additive.

SUMMARY

The purposes of this investigation are to test two conflicting social psychological models of human sociability and identify some possible sources of individual variation in daily solitary behavior. One model assumes that human gregariousness is a basic and constant need. The other assumes that it is a homeostatic need with extremes of either social interaction or solitary behavior producing pathological reactions but a great deal of individual variation within those limits.

Three general explanations of individual variation in solitary behavior are proposed that argue the importance of different social environments. These arguments are a contextual density effect, an antecedent contextual density effect and a differential individual susceptibility effect. The contextual density argument proposes that people's opportunities for solitary behavior are constrained by the density of the contexts of their behavior. The social context of the home and the community are examined as relevant environments and both spatial and temporal accessibility are considered important. In the antecedent contextual density argument past environmental experience is considered to be important. Specific hypotheses are made regarding the effects of social experience on the job and temporal marginality. The contextual density effect is tested with hypotheses of the effects of density of home environments, temporal marginality, and temporal congruency. In the antecedent contextual density argument, past environmental experience is considered to be important. Three specific effects

are hypothesized: a compensation effect, a carry-over effect and a null effect. All three are examined in testing first, the relationships between social experience on the job and discretionary solitary behavior, and second, the relationship between temporal marginality on weekdays and weekend discretionary behavior. Time is seen as an important intervening variable in these arguments. As elaborations two temporal effects are hypothesized: 1) a short term temporal decay of the compensation effect, and 2) a long term temporal reinforcement of the carry-over effect. In the third general explanation it is proposed that individuals are differentially susceptible to objective environmental structures. It is argued that the effects of past experience produce differential utilization of environmental opportunity structures such that individuals are differentially susceptible to similar environmental constraints. This argument integrates the two environmental explanations into one complex causal system.

In the analysis that follows some of these arguments received support and others did not. The constraints of temporal marginality and incongruity with spouse's work schedule were found to facilitate solitary behavior, whereas, the other immediate constraints had no consistent effect. Of the antecedent effects, environmental constraints in the work environment were found to effect people differently from constraints in the non-work environments. There was evidence for a compensatory relationship between work and non-work social experience and there was also evidence for a weak carry-over relationship between discretionary solitary behavior due to temporal marginality on weekdays

and discretionary behavior on weekends. When the independent effects of antecedent social experience at work and temporal marginality were jointly examined a strong interaction effect was found. This evidence was considered to be sufficient to confirm the principle of differential susceptibility. These findings of variation in individual propensity to engage in solitary behavior and differential susceptibility to environmental influences facilitating such behavior give tentative support to the homeostatic model of human social behavior.

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CHAPTER II

METHODOLOGY

The aim of this study is to test a set of hypotheses that have been derived from the several proposed explanations of why people experience varying amounts of solitude. The explanations in question posit that the immediate and antecedent contexts of people's activities are important sources of such variation. These explanations all have the general form of cross level explanations in which a distinction is made between units at different levels of scale and differences in the properties of the units at one level are used to explain differences in the properties of units at the other level. When the properties of the higher level units are analytical, that is when they are derived from the distribution of the properties of lower level individual units within the larger social or spatial unit (Dogan and Rokkan, 1969: 5), the explanation is called a "compositional effect" (Davis, Spaeth, and Huson, 1961; Valkonen, 1969). On the other hand when the properties of the higher order units are global, that is they are characteristic of the unit as a whole and not derivable from the characteristics of the individual members, then the explanation is called a contextual effect (Scheuch, 1969). In either form the higher level units can be thought of as "opportunity sets" or the "objective

environments" of the lower level units (Scheuch, 1969: 144) and they can be visually represented as follows:

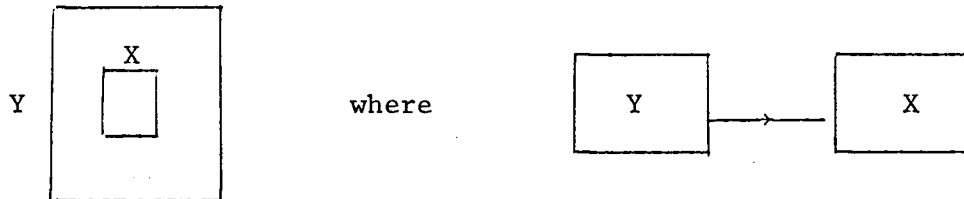


Fig. 7 A Relationship Diagram of a Contextual Effect

In this diagram Y represents a set of environmental properties, X represents a set of individual properties, and \rightarrow represents a causal connection between the two. For example if Y represents the number of other persons in the household of any given person, and X represents the amount of time that that person spends per day in solitary activities, and the size of the household is hypothesized to have an inverse effect on the amount of solitude that individual's experience; then this effect can be termed the "contextual effect of household size".

THE RESEARCH DESIGN

An ideal test of the effects of these different contexts on the solitude that people experience would be to use an experimental research design and observe individuals in some sort of long term experimental situation where these contexts could be manipulated and the resulting individual behavior could be studied. However, a body

of survey research data that was relevant to these hypotheses was immediately accessible for analysis. For this reason a secondary analysis is being made of data gathered using a survey research design. This consists of making static comparisons between people with different work shifts, different numbers of on-the-job associates, and different household compositions.

OPERATIONALIZATIONS OF THE CONCEPTS

Solitary Behavior

For the purpose of this analysis solitary behavior has been defined as a persons' behavior when no other persons are co-present in a given room with him. The particular things that people do under such conditions are referred to as solitary activities.

Extent of Participation

The degree of solitude that an individual experiences is measured in terms of the extent to which he participated in solitary activities. This is defined as the total amount of time per day that an individual spends in discretionary solitary activities.

Social Density of Environments

This is a variable property of the environments in which people reside and work. At work it is measured in terms of the number of other persons an individual has the opportunity to talk with about

non-work things while on the job, and the number of persons on the work crew. Away from work it is operationally measured in terms of the number of children in the home, the presence of other adults in the home, and the presence of relatives in the region of the community (the state).

Temporal Marginality

This concept refers to the degree to which a given person's work schedule is out of phase with that of the majority of the community. Temporally marginal workers are operationally defined as those working the afternoon and night shifts. Temporally modal workers are operationally defined as those who work day shifts.

Temporal Incongruity

This dimension is defined as the temporal similarity of husbands' and wives' work schedules. In this analysis it is treated as a dichotomy. Housewives who are not otherwise employed are assumed to work temporally modal schedules and when the husbands' and wives' schedules differ they are considered temporally incongruent.

THE DATA

The data used in this analysis was collected by Gray (1968) for the purpose of testing a series of hypotheses of the effects of shift work on social participation. It consists of daily activity

logs that were gathered by interviewing a sample of industrial workers. In the interviews the interviewers reconstructed the activities of the respondents for the previous workday and weekend. This particular method of gathering the data was employed because it has proven to yield data with larger returns, better validity and at less expense than the alternative diary method of collecting such daily behavioral data, (Gray, 1968: 41-46).

THE SAMPLE OF PERSONS

The original sample of 528 men was drawn from the employee rosters of two lumber and plywood firms in Eugene, Oregon. The scope of the sample was purposively restricted to married, lumber mill workers, in manual occupations, who worked steady shifts. This was done in order to control the effects of possible confounding variables. This reduced the sample population to 264 afternoon shift workers and approximately twice as many day shift workers. In order to obtain approximately equal proportions of day and afternoon shift workers, Gray then selected a subsample of the day shift workers equal in number to the sample of afternoon shift workers. This subsample was chosen by first selecting every second name in the alphabetically ordered list and then with a table of random digits randomly eliminating others until it was equal in number to the sample of afternoon shift workers. (Gray, 1968: 51). For a number of reasons that are illustrated in Table 1, the final sample of completed interviews is considerably smaller. It

consists of 343 interviewed male lumber mill workers, on steady shifts, who were married and living with their wives at the time of the survey. The selection methods used are such that they rule out the possibility of generalizing the results beyond the characteristics of this sample. However, they do facilitate testing the internal validity of the arguments presented in the first chapter by reducing some of the possible confounding sources of variation in social participation such as occupational and residential status, irregular work hours, and marital status.

TABLE 1

The Disposition of the Original Sample of Persons^a

Disposition	Number
Interviews completed	343
Respondents refused	34
Moved (could not locate)	42
Insufficient address	44
Could not catch at home	30
Terminated employment	14
Respondents not eligible at the time of interview	<u>21</u>
TOTAL	528

^aSource: G. Gray, The Effects of Temporal Marginality Upon Social Participation, Unpublished Ph.D. Dissertation, University of Oregon, (August, 1968). Adapted from tables on pages 52, 53.

THE SAMPLE OF BEHAVIORAL RECORDS

According to Foote (1961: 167), one of the unique problems of time budget or activity log studies is with controlling and interpreting sampling bias in the time period that the data covers. The problem is that in making static comparisons of the behavior of different sets of people, the time periods that are being compared may contain behavioral biases. For example, two sets of people of different ages might be compared to see if the older are more solitary than the younger people. However, if the behavior of the older people is recorded for Sundays and that of most of the younger people is recorded for weekdays, any differences in behavior that are attributed to age may well be spurious.

There are two solutions to this problem. The first and best is to use a sampling technique to either control or randomize the variations in behavior that are related to the time period sampled. Unfortunately, since in this case the data has already been gathered, the second and only alternative available is to use tabular statistical control or subsampling to limit the bias in the data.

As can be seen in Table 2 the disposition of the sample of 1029 days has a bias. On weekdays 100 per cent of the sample is working, whereas on Saturdays and Sundays 13.4 per cent and 4 per cent respectively is working. This bias combines with any cultural differences of behavior on these days to produce variation in the distribution of daily solitary activities that cannot be explained by the variables

being considered. By partialing on different days of the week as has been done in Table 3, one can see that this confounding effect is related to some 16 per cent of the variance in individual solitary behavior. It can also be seen that although the mean amount of time spent in solitary activities on each day of the week is about the same, on Saturday and Sunday the proportion of participants is smaller and the variation in extent of participation is greater. One can see in Table 4 that less than one per cent of this variance is directly related to the proportions of persons who are working on those days. Most of it must be related to either the differences in the time available to most of the sample or cultural difference in behavior on these days.

TABLE 2

The Disposition of the Initial Sample of Activity Logs
by the Day of the Week and the Respondent's
Working Status on the Recorded Day

Working Status	Weekdays	Weekends		Total
		Saturdays	Sundays	
Workday	343	46	14	403
Day off	0	290	325	615
No response	<u>0</u>	<u>7</u>	<u>4</u>	<u>11</u>
TOTAL	343	343	343	1,029

TABLE 3

The Amount of Time the Total Sample and Participants Only
Spent in Solitary Activities on Different Days
of the Week (in Hours)

Statistic	Day of the Week			Total
	Weekdays	Saturdays	Sundays	
<u>Total Samples:</u>				
Mean	2.1	2.6	2.1	2.3
Standard Deviation	2.2	3.1	2.8	2.7
N	341	339	339	1019
Non Response	<u>2</u>	<u>4</u>	<u>4</u>	<u>10</u>
TOTAL NUMBER OF RECORDS	343	343	343	1029
Eta Squared = .16 Eta = .4				
<u>Participants Only:</u>				
Mean	2.5	3.9	3.5	3.2
Standard Deviation	2.1	3.0	2.8	2.7
N	279	224	207	710
Per cent Partici- pating	82%	67%	61%	70%
TOTAL N	341	339	339	1019
Eta Squared = .13 Eta = .4				

TABLE 4

The Effect of a Person's Working Status and the Day of the Week on Time Spent Alone (Mean Hours)

Working Status	Day of the Week					
	Weekdays	(N)	Saturdays	(N)	Sundays	(N)
Workday	2.1	(341)	2.0	(60)	1.8	(23)
Non-workday	...	(0)	2.7	(279)	2.2	(316)
Difference7		.4	
E ²00		.00	
E0		.0	

Since this variation is not accounted for in the posited explanations, its possible effects on the hypothesized relationships will be controlled by selecting a subsample of persons with comparable activity records and examining weekdays, Saturdays and Sundays separately. The subsample selected consists of the 290 workers shown in Table 2 (page 38) who work on weekdays and have the whole weekend off.

THE ANALYSIS OF THE DATA

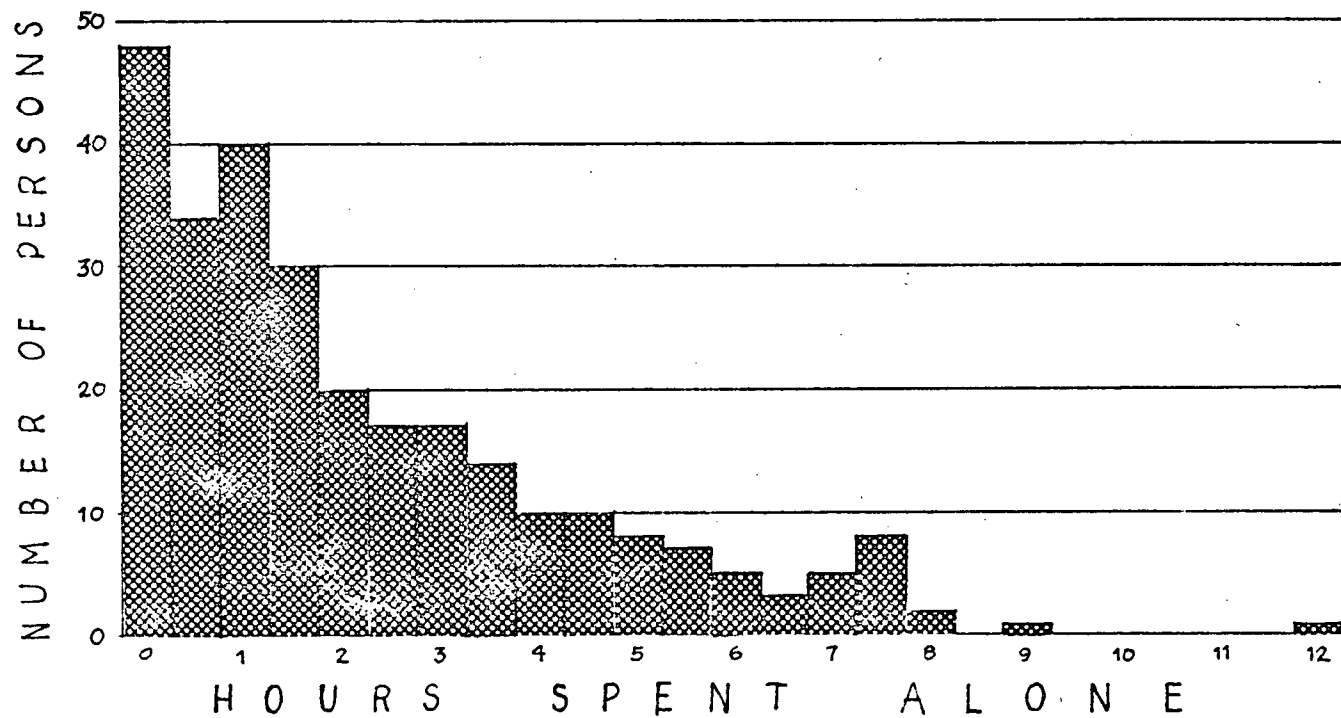
The data used had been coded onto punch cards for machine processing. Before beginning the analysis it was necessary to code some additional information (the number of persons talked to daily at work) and clean out some coding errors in the distributions of some of the variables.

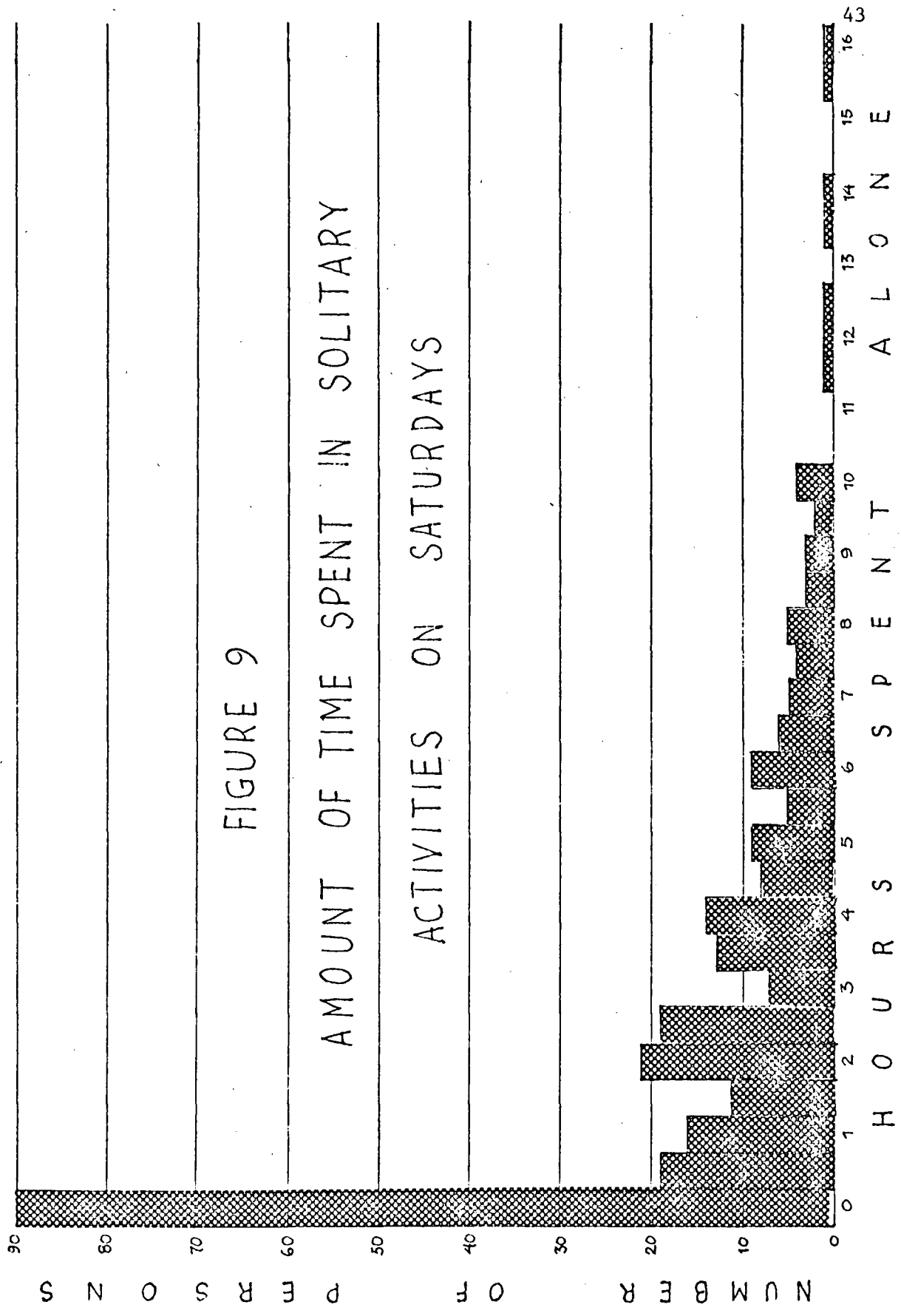
Two computer programs were used in the analysis itself; MVTAB, a multivariate tabular analysis program; and SP1, a program written by the author to select partial samples and compute their frequencies, means, standard deviations, and variances for specified variables. The testing of the hypothesized relationships was based on two statistics: the Mean and Eta.

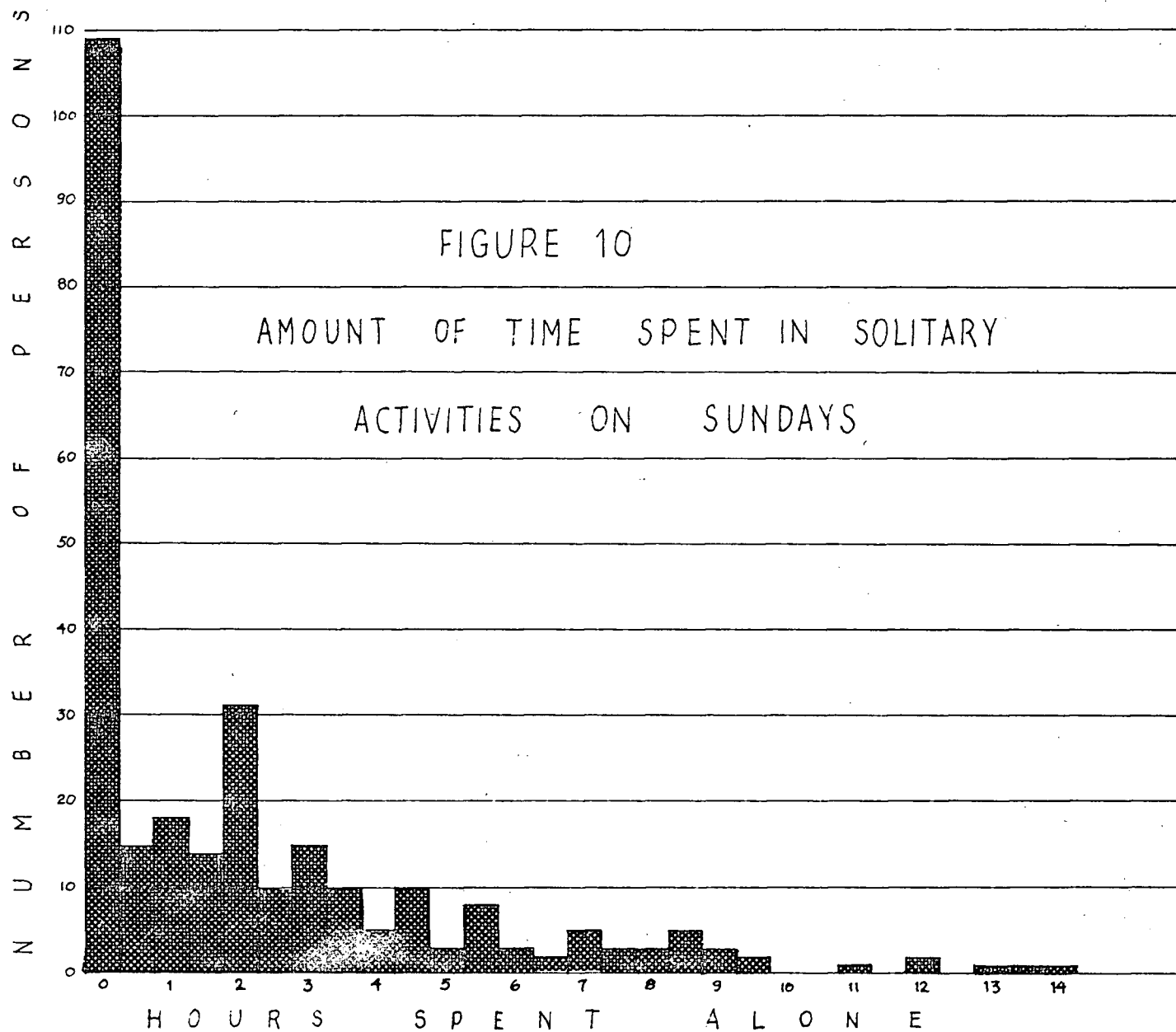
The signs and magnitudes of differences of the mean solitary times of conditional groups were analyzed to test the direction and consistency of the hypotheses. As can be seen from the frequency histograms in Figures 8, 9 and 10, the distributions of solitary behavior have a strong positive skew. The non-normal shape of these distributions and the partially non-random sample ruled out the utility of using the standard statistical tests of the significance of differences in the means for this phenomena. However, some decision rules in this analysis that had both statistical and experiential relevance were needed. It was decided that mean differences of 1 to 2 hours (approximately the weekday standard deviation) in the predicted direction would be considered weak confirmation of the hypotheses; differences of 2 to 3 hours would be considered moderate confirmation and differences of 3 hours or more would be considered strong confirmation.

As another test of the strength of the posited zero order relationships, the statistic Eta was used. Eta was chosen as an appropriate measure of the degree of association between the independent variables and the dependent variables because the dependent variables were always interval variables (solitary time) and the independent

FIGURE 8
AMOUNT OF TIME SPENT IN
SOLITARY ACTIVITIES ON WEEKDAYS







variables are in most cases treated as nominal attributes or dichotomies.

Eta squared is defined as

$$E^2 = 1 - \frac{\text{Within variance of Y}}{\text{Total variance of Y}}$$

It can be interpreted as a measure of the proportion of the original variance of Y that occurs when X also varies (Anderson and Zelditch, 1969: 155-160). Because the interpretation of Eta is analogous to those of r, and Q, we have used the terminological conventions suggested by Davis (1971: 49) in describing the strength of the association between the tested variables.

In the theory of Chapter 1, a number of the hypotheses posited that interactions between several independent variables affect the amount of time people spend alone. In testing for the presence of and interpreting these interaction effects a method suggested by Meissner¹ was used. It is outlined as follows in the case of a fourfold table.

a	b	(b-a)
c	d	(d-c)
(c-a)	(d-b)	(d-c) - (b-a)

Where a, b, c, and d are the mean solitary times of each of the 4 conditional distributions; if the effects of the independent variables are

¹From a discussion of techniques to use in the analysis of survey data.

additive then:

$$(b-a) = (d-c)$$

$$(c-a) = (d-b)$$

and $(d-c) - (b-a) = 0$

However, if $(b-a) > (d-c)$ or if $(b-a) < (d-c)$ and the same for the other side of the table then

$$(d-c) - (b-a) \neq 0$$

and the degree of interaction is explained by the difference in the differences of the conditional means.

These then are the basic methods that have been used in the analysis of the data in the following chapter.

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CHAPTER III

THE ANALYSIS

In this chapter the methods and the data described in the second chapter are used to test the relationships posited in the first chapter. To review briefly, these relationships are the ramifications of three general explanations of differences in discretionary solitary behavior. One identifies differences in dimensions of people's immediate non-work environments as a source of such variation. The other identifies differences in social experience in temporally antecedent environments as a source of differences in the amount of time spent in consequent discretionary solitary behavior. The third postulated that certain individual properties make people differentially susceptible to environmental structures. Specifically, an interaction effect was hypothesized between individual dispositions produced by antecedent experience and present environmental structures. The three are termed an immediate contextual effect, an antecedent contextual effect, and a differential susceptibility effect. Before testing these relationships, however, a brief examination of the distribution of the solitary activity of this sample is in order.

THE DISTRIBUTION OF SOLITARY BEHAVIOR

In the discussion of the behavioral sample in the last chapter the distributions of the amount of time the final sample spent in solitary activities were presented in Figures 8, 9, and 10, (pages 42, 43, 44). As can be seen in these frequency histograms, the amount of time that people spent in solitary activities is a positively skewed distribution that is widely dispersed. It ranges between 0 and 12 hours on weekdays, 0 and 16.5 hours on Saturdays, and 0 and 14 hours on Sundays. From these frequency histograms and the distribution statistics in Table 5, three generalizations are possible that describe the most salient points of the distributions.

TABLE 5

The Amount of Time per Day Spent in Solitary Activities
on Weekdays, Saturdays, and Sundays (in Hours)

Day of the Week	Extent of Participation in Solitude		
	(N)	Mean Hours	Standard Deviation
Weekdays	(281)	2.2	2.3
Saturdays	(279)	2.7	3.2
Sundays	(279)	2.2	2.4

1. Most people spend a very small portion of their day in discretionary solitary activities.
2. A fairly large portion of the sample (16.9 per cent on weekdays, 31.8 per cent on Saturdays, 38.5 per cent on

Sundays) experience no discretionary solitude according to their activity logs.¹

3. The extent of participation in general shows considerable variation (i.e., $s = 2.3$ hours on weekdays, $S = 3.2$ hours on Saturdays, and $s = 2.4$ hours on Sundays).

IMMEDIATE CONTEXTUAL EFFECTS ON SOLITARY BEHAVIOR

The general form of this postulated relationship is that the extent of people's participation in non-work solitary activities varies inversely with the number of persons in the same global non-work environment. Specifically, this contextual effect is to be measured in terms of the following variables: the number of children present in the person's house of residence, the presence of other adults in the household, the number of relatives in the surrounding region, the shift of the worker, and the degree of temporal congruency with one's spouse's and children's work schedules.

¹This second generalization seems to be directly contradictory to the earlier findings of Berger and Sorokin that some 31 per cent of everyone's daily activities were solitary. The source of the contradiction is perhaps in the way that solitude has been defined as a state of being physically removed from the presence of other people, while in their case it was defined as a state of not being actively involved in verbal social interaction with other people.

Spatial Accessibility to Other Persons

Hypothesis (1) predicts that:

Hypothesis (1) The larger the number of persons in the household the smaller the amount of solitude people will experience.

In Table 6 this relationship is examined in terms of the number of children present in the household. The amount of variation in solitude explained in each case (6 per cent on weekdays, 3 per cent on Saturdays, and 5 per cent on Sundays) suggests that a weak relationship does exist ($E = .2$, on all three days) in this data. Unfortunately the signs of the differences in the means are inconsistent from weekdays to weekends. On weekdays hypothesis (1) receives some confirmation in that four of the six conditional means of persons with children are, as predicted, less than the mean amount of solitary time of persons with no children at home. On Saturday and Sunday, however, these differences in solitude are not in the predicted direction.

Hypothesis (1) can also be tested by examining the effect of the presence of adults other than one's spouse in the household. Their presence should decrease the opportunity for individuals to participate in solitary activities. This prediction holds on weekends but not on weekdays. In Table 7, contrary to the prediction, people with other adults present spend about 12 minutes more in solitary activities on weekdays. On Saturdays and Sundays, however, persons with other adults

TABLE 6

Extent of Participation in Solitary Activities (Mean Hours)
on Different Days of the Week by the Number of
Children Present in the Household^a

Number of Children Present	Day of the Week					
	Weekdays Mean Hours	(N) ^b	Saturdays Mean Hours	(N)	Sundays Mean Hours	(N)
6+	1.8	(6)	1.2	(6)	5.8	(6)
5	3.1	(10)	4.0	(10)	4.4	(10)
4	1.9	(25)	3.5	(25)	2.5	(25)
3	1.5	(42)	2.5	(42)	1.6	(42)
2	2.5	(65)	2.6	(65)	2.5	(65)
1	2.2	(60)	2.4	(60)	2.2	(60)
0	2.4	(69)	2.4	(67) ^c	1.7	(67)
TOTAL	2.2	(277)	2.7	(275)	2.2	(275)
Eta Squared	.06		.03		.05	
Eta	.2		.2		.2	

^aSource: How many children do you have? Could you tell me the age of your children and whether they live at home?

^bCell frequencies will be presented in parentheses in the tables that follow in the analysis but sometimes without the accompanying tab.

^cThe difference in the Ns of the cells in this row are due to two respondents in the data who did not complete activity logs for Saturday and Sunday.

in the home spend an average of 29 and 22 minutes less in solitary activities. On all three days the magnitude of the differences and the amount of variation in solitude explained by the presence of other adults in the one household are negligible.

From this data then, it would seem that hypothesis (1) of an immediate contextual effect of household composition on people's solitude receives neither sufficient nor consistent confirmation.

TABLE 7

The Effect of Co-residence with other Adults^a on
Solitary Time on Weekdays, Saturdays
and Sundays (Mean Hours)

Presence of Other Adults ^b	Days of the Week					
	Weekdays		Saturdays		Sundays	
Present	2.4	(12)	2.2	(11)	1.9	(11)
Absent	2.2	(267)	2.7	(265)	2.2	(265)
Difference	+ .2		- .5		- .3	
E ²	.00		.00		.00	
E	.0		.1		.1	

^aAdults other than the respondent's spouse.

^bSource: Does anyone else live with you as a part of your household? What is their immediate relationship to you . . . ?

Hypothesis (2) predicted that another dimension, the number of relatives in the region of the community would have a contextual effect on people's solitary behavior. Specifically it stated that:

Hypothesis (2) Persons with other relatives living in the region of the community will spend less time in solitary activities than persons with no relatives living nearby.

In Table 8, the signs of the differences in these conditional means are inconsistent. Only on Sundays is the difference in the predicted direction. However, the magnitude of the difference is too small to be considered significant. In fact, for all three days the amount of variation in the solitary behavior of this sample explained by the presence of relatives in the region is negligible. Thus hypothesis (2) also receives neither strong nor consistent confirmation from the data at this level of analysis.

TABLE 8

The Effect of the Number of Relatives Present in the Region^a on Solitary Time on Weekdays, Saturdays and Sundays (Mean Hours)

Number of Relatives Present ^b in the Region	Day of the Week					
	Weekdays (N)		Saturdays (N)		Sundays (N)	
More than three	2.3	(135)	2.9	(135)	2.1	(135)
Three or less	2.1	(146)	2.5	(144)	2.2	(144)
Difference	- .2		- .4		+ .1	
E ²	.00		.00		.00	
E	.0		.0		.0	

^a in the same state

^b Source: What relatives do you and your wife have that you visit with occasionally?

In summary, at this initial level of analysis, there is insufficient support for the hypothesized inverse relationship between the number of persons in the household or the number of relatives in the community and the amount of time people spend alone.

Temporal Constraints on Accessibility to Other Persons

Temporal Marginality

Hypotheses (3) and (4) postulated that the temporal context of people's non-work hours would also affect their solitary behavior. These were stated as follows:

Hypothesis (3) Persons who work temporally marginal shifts will spend more of their non-work time in solitary activities on workdays than persons who work temporally modal shifts.

Hypothesis (4) Persons whose days off work are temporally marginal will spend more time in solitary activities on their days off work than persons whose days off work are temporally modal.

The temporal marginality effect of hypothesis (4) is impossible to test with the data available. Hypothesis (3), however, is tested with the data presented in Table 9. As hypothesized, afternoon and night shift workers spend an average of 1 hour and 14 minutes more in solitary activities than do day shift workers. Temporal marginality explains 7 per cent of the total variance. Thus according to the

criteria established, there is a weak positive relationship between temporal marginality and solitary behavior.

TABLE 9
The Effect of Temporal Marginality on
Solitary Time on Weekdays

Temporal Marginality ^a	Mean Number of Hours Alone on Weekdays
Modal (day shifts)	1.5 (127)
Marginal (afternoon and night shifts)	2.8 (154)
Difference	+1.3
E ²	.07
E	.3

^aSource: What are your normal working hours during the day?

Temporal Incongruity

As an elaboration it was argued that once children are of school age they become integrated into the modal community time schedule and are less accessible to persons who are temporally marginal. On the basis of this argument it was hypothesized that:

Hypothesis (5) Of the temporally marginal workers who have children living at home, those whose children are of school or working age will spend more time in solitary activities

on weekdays than those whose children are not of school or working age.

The data to test this argument is presented in Table 10. It is clear from the table that the age of the men's children does not have the predicted effect on the amount of time that marginal workers spend alone. In fact, there is a negligible relationship in the opposite direction. Thus the hypothesized effect of children's age remains unconfirmed.

TABLE 10

The Effect of Children's Ages on the Solitary Time
of Marginal Shift Workers on Weekdays

Children's Age ^a	Mean Number of Hours Spent Alone	(N)
Preschool age	2.7	(85)
School age or older	2.4	(36)
Difference	- .3	
E ²	.02	
E	.1	

^aSource: Could you tell me the age of your children and whether they live at home?

A further elaboration of this temporal contextual effect argued that when wives are employed and their work schedules are at different hours than their husbands' the opportunities for solitary behavior would

increase. From this reasoning hypothesis (6) predicted that:

Hypothesis (6) Workers whose shifts are incongruent with those of their employed wives will spend more time in solitary activities than workers whose shifts are congruent with those of their employed wives.

In Table 11 the conditional distribution of the solitary times of workers whose shifts are congruent with the shifts of their wives is compared with the distribution of those whose shifts are incongruent with their wives'. As predicted, incongruent workers spend an average of approximately an hour more alone. This effect explains some 5 per cent of the variation in solitary behavior of this sample.

TABLE 11

The Effect of Incongruency of Spouses' Work Schedules^a on the Amount of Time Spent Alone on Weekdays

Incongruency of Work Schedules	Mean Number of Hours Spent Alone	(N)
Congruent	1.6	(129)
Incongruent	2.7	(152)
Difference	+1.1	
E ²	.05	
E	.2	

^aSource: Does your wife work? What are her normal working hours during the day?

Coding: 'Congruent' includes day shift workers whose wives also work day shifts, day shift workers whose wives are not employed, and afternoon and night shift workers whose wives work the same shifts. 'Incongruent' includes all other combinations.

The Independent and Joint Effects of Marginality and Incongruity

The effects of marginality and incongruency, however, are confounded in this data. Most of the workers whose shifts are incongruent are also temporally marginal (94.7 per cent) and most of those who are congruent are temporally modal (92.2 per cent). In hypothesis (7) and its corollary hypothesis (8) this confounding effect of temporal marginality is controlled by postulating an independent congruency effect.

Hypothesis (7) Of the workers who are temporally marginal, those whose shifts are incongruent with their wives' work schedules will spend more time in solitary activities than those whose shifts are congruent with their wives'.

Hypothesis (8) Of the workers who are temporally modal, those who are incongruent will spend more time alone than those who are congruent.

These hypotheses are tested in Table 12 by examining the joint effects of shift and congruency. As predicted both day and afternoon shift workers whose shifts are temporally incongruent with their wives' spend more time alone. On the basis of this data and the evidence in Table 11, hypotheses (3), (6), (7), and (8) receive consistent confirmation although in Table 12, the magnitudes of the independent effects of congruity are no longer significant. Furthermore, one can see that

the combination of both temporal marginality and incongruity produces a mutually suppressive interaction effect. That is, those persons who are both marginal and incongruent spend about half-an-hour less in solitary activities on weekdays than they would if the two isolating variables were strictly additive.

TABLE 12

The Joint Effects of Incongruency and Marginality on the Amount of Time Spent alone on Weekdays (Mean Hours)

Incongruency	Temporal Marginality				
	Modal	(N)	Marginal	(N)	Difference
	Mean Number of Hours Alone				
Congruent	1.5	(119)	2.7	(10)	+1.2
Incongruent	2.1	(8)	2.8	(144)	+ .7
Difference	+ .6		+ .1		- .5

In summary, temporal social constraints have the effect of facilitating solitary behavior as was predicted. However, in one instance, temporal constraints on a worker's interaction with his children, this predicted effect was not confirmed. This finding however concurs with the earlier finding that the number of children in the household does not have a consistent effect on the amount of time these men spend alone. In conclusion, for this sample, temporal constraints on interaction with their wives are important but similar constraints on interaction with their children are not.

ANTECEDENT CONTEXTUAL EFFECTS ON SOLITARY BEHAVIOR

The general form of this argument is that persons' social experience in temporally antecedent contexts is related to their social behavior in later settings. Specifically, two different causal processes have been postulated:

- (1) a carry-over or generalization process
- (2) a compensatory process.

The Effect of Social Experience at Work

A series of conflicting hypotheses were presented to test the relationships between people's work experience and their non-work behavior. The first of these, hypotheses numbers (9) and (10) were stated as follows. Hypothesis (9) predicts that workers will compensate for their experience at work in their non-work activities.

Hypothesis (9) People who are socially isolated at work will spend less time in solitary non-work activities on workdays than people who are not socially isolated at work.

Hypothesis (10) makes a contradictory prediction to that of hypothesis (9). It predicts that:

Hypothesis (10) People who are socially isolated at work will spend more time in solitary activities in their non-work hours on workdays than people who are not socially isolated at work.

Following Meissner's (1970) argument, it is also possible that people are equally gregarious and their behavior in different institutional settings is unrelated. The following third hypothesis was introduced to test this possibility.

Hypothesis (11) The differences predicted in hypotheses (9) and (10) will be neither strong nor significant.

These hypotheses are tested indirectly with two variable measures of the density of persons in the work environment; 1) the number of persons on the work crew, and 2) the number of persons the worker has the opportunity to talk with about non-work things while he is on the job. They were also tested with a direct measure of the antecedent experience: the number of persons talked to in the course of the workday.

Table 13 presents the relationships between each of the three measures of social interaction at work and discretionary solitude on weekdays. For all three measures the findings are consistent. This negative relationship confirms the compensatory hypothesis. Two of the three measures, social opportunity at work and size of work crew respectively explain 4 per cent and 2 per cent of the variance in solitary behavior. However, only in the case of social opportunity is the difference in the means of sufficient magnitude to be considered significant. Thus there is consistent (and in one instance sufficient) confirmation of the compensatory hypothesis.

TABLE 13

The Effects of Work Crew Size, Informal Social Opportunity,
and Number of Social Contacts on the Job on the Amount
of Time Spent Alone on Weekdays

Social Experience at Work	Mean Number of Hours Spent Alone	(N)
<u>Size of Work Crew</u> ^a		
Five or more	2.4	(145)
Four or less	2.0	(134)
Difference	- .4	$E^2 = .02$ $E = .1$
<u>Informal Social Opportunity</u> ^b		
High (2 or more persons)	2.5	(203)
Low (1 or less persons)	1.5	(78)
Difference	-1.0	$E^2 = .04$ $E = .2$
<u>Social Contact at Work</u> ^c		
Some (1 or more persons)	2.2	(257)
None	2.0	(24)
Difference	- .2	$E^2 = .00$ $E = .0$

^aSource: How many other people work on the same work crew with you?

^bSource: How many people do you have a chance to talk with about non-work things?

^cSource: How many people do you have to talk to as a part of your job?

Temporal Marginality and Weekend Solitary Behavior

As a further test of the consistency of the antecedent effects it was argued that one could examine the relationship between temporal marginality on workdays and people's solitary behavior on the weekend. Hypotheses (12) and (13) are also stated in terms of the compensatory and carry-over effects. In Table 15 one can see that the differences in the conditional means are inconsistent from Saturday to Sunday.

TABLE 14

The Antecedent Effects of Temporal Marginality on the Amount of Time Spent Alone on Saturday and Sunday

Temporal Marginality	Hours Spent Alone On		
	Saturday	Sunday	(N)
Modal shift (days)	2.8	2.0	(127)
Marginal shift (afternoon and night)	2.6	2.3	(152)
Difference	- .2	+ .3	

Because of this inconsistency, it is impossible to reject the null hypothesis. This provides initial support to the steady state model of gregariousness. The further temporal theoretical elaborations that follow provide the crucial test of the general social psychological models in question.

Temporal Suppression of Compensatory Disposition

The temporal elaboration to the compensatory hypothesis argued that the compensatory propensity would decay over a relatively short time period. That is, ensuing compensatory behavior would have the effect of satisfying the homeostatic need, and thus reducing the differences in behavior attributable to this dispositional effect. Specifically it was hypothesized that:

Hypothesis (14) For those persons with both Saturday and Sunday off work, the differences between persons with different levels of social experience at work will be less on Saturdays than during non-work periods on workdays.

Hypothesis (15) For those persons with both Saturday and Sunday off work, the differences between persons with different levels of social experience at work will be less on the second day off (Sunday) than on the first day off (Saturday).

These hypotheses are tested by examining the change in the effect of the two dimensions on discretionary solitary time from workdays to Saturdays and Sundays. These conditional distributions are presented in Table 15. As predicted in hypothesis (14), the differences in the solitary behavior of persons with differential social experience at work are in both instances less on Saturdays than on workdays. However, according to the criteria adopted for this analysis, these

reductions of .7 and .2 hours are not significant. Contrary to the predictions of the corollary hypothesis (15), a similar reduction in the differences between these groups does not consistently appear from Saturday to Sunday. Thus there is consistent although not sufficiently strong confirmation of the hypothesized decaying effect of the compensatory disposition within the first day after the antecedent work experience but not on the second.²

TABLE 15

The Joint Effects of Social Opportunity at Work and Intervening Time on Time Spent Alone (in Hours)

Social Opportunity at Work	Day of the Week			N
	Weekdays	Saturdays	Sundays	
<u>Informal Social Opportunity at Work:</u>				
High	2.5	2.8	2.3	(203)
Low	1.5	2.5	2.8	(78)
Difference	-1.0	-0.3	+0.5	
<u>Size of Work Crew;</u>				
Five or more	2.4	2.8	2.2	(145)
Less than five	2.0	2.6	2.1	(143)
Difference	-0.4	-0.2	-0.1	

²With this data it was impossible to test the independent effects of different days of the week.

Temporal Reinforcement of the Carry-Over Effect

A further temporal elaboration in the first chapter argued that the length of time that a person had experienced an environmental influence was a possible modifier of the antecedent effect. Basically it postulated that through time people adapt to the environmental influences by developing different skills or a different dispositional level for social or solitary behavior. This effect could confound the previous results. The specific hypotheses to test this effect were stated as follows:

Hypothesis (16) Persons who have been temporally marginal for several years or more will spend more time in solitary activities than those who have been temporally marginal for only a short time.

Hypothesis (17) When controlling for both length of time on shift and the day of the weekend, marginal shift workers should experience less solitude in all cells (compensation effect).

Hypothesis (18) The differences between marginal and modal shift workers should be less on Sundays than on Saturdays (suppression effect).

Table 16 presents the first test of this long term reinforcement of the adaptive carry-over effect. As predicted the persons who

TABLE 16

The Effect of Years of Temporal Marginality on the Amount of
Time (in Hours) Marginal Workers Spent Alone

Years on Afternoon Shift	Mean Number of Hours Spent Alone	(N)
Less than five years	2.5	(101)
Five or more years	3.3	(53)
Difference	+ .8	$E^2 = .02$ $E = .2$

have been temporally marginal for a longer time spend approximately 48 minutes more alone on weekdays. This difference, however, is of insufficient magnitude to fully confirm hypothesis (16). In Table 17 it receives a further test when the effects of shift, length of time on shift, and the length of time since the last workday are simultaneously examined. At this level of analysis in three of the four comparisons there is a carry-over relationship between people's weekday temporal marginality and their weekend solitary behavior. This refutes the assumption of short term compensation for weekday temporal marginality that is basic to the argument of a temporal decay effect. On both days there is a consistent but negligible reinforcement of the carry-over effect of marginality with increasing years on that shift.

In summary, environmental constraints on accessibility to other persons at the work place have quite different effects from constraints on accessibility to other persons in non-work environments. These people compensated for their social experience at work in their choice

of non-work social or solitary activities. Furthermore, this compensatory disposition was found to decay within the first day after the work experience. On the other hand, greater non-work solitary activity on weekdays due to the constraints of temporal marginality is weakly generalized to peoples' weekend behavior. This solitary activity is also slightly reinforced with the increasing years of temporal marginality. Although they are somewhat inconclusive, these findings give some support to the homeostatic model of human sociability.

TABLE 17

The Joint Effects of Temporal Marginality and Length of Time
on a Given Shift of Solitary Activity
on Weekend Days

Temporal Marginality	Number of Years on Shift				Difference
	Less than 5 (N)		5 or more (N)		
	Number of Hours Alone on Saturday				
Modal	3.1	(55)	2.6	(70)	- .5
Marginal	2.6	(101)	2.7	(53)	+ .1
Difference	- .5		+ .1		+ .6
	Number of Hours Alone on Sunday				
Modal	1.9	(55)	2.0	(70)	+ .1
Marginal	2.2	(101)	2.6	(53)	+ .4
Difference	+ .3		+ .6		+ .3

DIFFERENTIAL INDIVIDUAL SUSCEPTIBILITY TO ENVIRONMENTAL CONSTRAINTS

The first chapter introduced an argument for a third possible relationship between individual behavior and environmental influences. This argument proposed that individuals use similar environments differently because of differences in their perceptions, skills, resources, and dispositions. The dispositional argument is useful in this investigation because it is a means of relating the other two explanations of immediate and antecedent contextual effects. Specifically, an interaction effect was predicted between these two relationships such that:

Hypothesis (19) Persons who experience high levels of interaction at work and work marginal shifts will spend more time in solitary activities than if the independent effects of these were additive.

Table 18 presents the examination of this effect. As expected, the combination of these two variables produces a strong interaction effect of an hour more solitary behavior than if they are considered independently. The independent effects of these two different variables are exactly alike. Marginality has a weak effect when people are compensating for solitary experience at work. Similarly the antecedent effect of social experience at work is weak when people work modal shifts.

This further evidence of the compensatory relationship between peoples' social experience at work and their solitary behavior when off work provides additional confirmation of the homeostatic model of

TABLE 18

The Joint Effects of Social Opportunity at Work and Temporal Marginality on Solitary Behavior on Weekdays

Social Opportunity at Work	Work Shift				Difference
	Modal (days)	(N)	Marginal (afternoon and night)	(N)	
	Mean Number of Hours Alone on Weekdays				
High	1.7	(85)	3.1	(118)	+1.4
Low	1.3	(42)	1.7	(36)	+ .4
Difference	+ .4		+1.4		+1.0

human social behavior. Perhaps one of the most interesting findings of this investigation is that antecedent constraints do not all have the same effects. The important intervening variable is which social setting they affect. People compensate for extreme experiences in their work setting. But those variables that affect their non-work social behavior on weekdays carry over into their weekend behavior in the same settings.

This completes the analysis of the hypotheses presented in the first chapter. A further examination of the total amount of variation in the solitary behavior of this sample of persons explained by all of the variables introduced in this enquiry and the relative effects of each of these seems worthwhile. This however, would require more sophisticated multivariate statistical techniques.

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CHAPTER IV

THE CONCLUSION

CONCLUSIONS OF THE STUDY

This study used three general explanations--an immediate contextual effect, an antecedent contextual effect, and a differential individual susceptibility effect--in attempting to explain differences in the amounts of time people spend alone in a day. From these general explanations, a number of relationships with specific contextual variables were hypothesized. Testing these relationships in a secondary analysis of activity log data yielded the following results.

1. The extent of co-residence with other adults or children has no constant independent effect on peoples' daily solitary behavior.
2. Temporal constraints on peoples' opportunities for total social interaction, in general, and interaction with one's spouse, in particular, facilitate solitary behavior.
3. Contextual variables have different antecedent effects depending on the particular context of the previous experience:
 - (a) at work

People compensate for their solitary or social experience at work in their choice of solitary or social activities when they are not working.

(b) In the community and household

Differences in non-work social interaction on weekdays produced by marginal shift work are generalized to peoples' weekend solitary behavior.

4. The increases of solitary behavior caused by temporal marginality are amplified when people work a marginal shift for long periods of time.
5. The disposition to compensate in their non-work solitary behavior for their working social experience decreases as the disposition is realized in peoples' discretionary behavior. Differences in solitary behavior caused by this compensatory disposition do not last into the second day of the weekend.
6. People with these different dispositions to participate in solitary activities are differentially susceptible to opportunities to engage in such activities.

These findings of individual variation in solitary behavior support the homeostatic model of human sociability.

LIMITATIONS OF THE STUDY

This was a secondary analysis of data gathered for another purpose. The sampling techniques employed in gathering the data for

that other purpose limit the inferences that are possible in this analysis. These inferences are limited to persons with similar characteristics of the sample of married male industrial mill workers who are working steady shifts.

The non-random nature of the sample and the strong skew of the distribution of time spent in solitary activities limited the power of this analysis. This could be improved by performing some normalizing linear transformation on the distribution of solitary behavior. This would allow the use of conventional significance tests. This should have the effect of increasing the strength of some of the independent relationships and reducing the interaction effects in these data (Davis, 1969: 21).

The periods of behavior sampled also limited the extent of this analysis. Without both working and non-working people on all days of the week it was impossible to assess or control for cultural differences in behavior on the different days.

There is also a third serious limitation. The analytical techniques employed were not sophisticated enough to test the models fully. Standard tests of the significance of the differences in the means could probably have been used. As it was the criteria of significance that were chosen were probably too severe. Multivariate methods of analysis could also have been used to examine the relative and cumulative effects of all the predictor variables. To do so would require statistical techniques capable of handling the following problems:

1. sorting out complex multivariate effects without attrition of cell sizes,
2. calculating the total variance explained in a non-additive multivariate model as well as the relative effects of different predictor variables,
3. handling skewed distributions on the dependent variables,
4. a multivariate analysis with nominal predictor variables.

The recently developed AID (Automatic Interaction Detector) and MGA (Multiclassification Analysis) (Andrews, 1969; Sonquist and Morgan, 1964) when used together are reportedly able to handle all of these problems. These might be employed to carry the analysis to completion in the future.

IMPLICATIONS OF THE STUDY

Two of the findings of this analysis are contradictory to the findings of other investigations in the literature. These suggest two problems for further research into differences in total social or solitary behavior. Contrary to the findings of Berger and Sorokin (1939), a considerable portion of this sample did not engage in solitary activities at all. Berger and Sorokin found that all persons in their sample spent 31 per cent of their day in solitary activities. This discrepancy is more than likely due to the different ways that solitary behavior was measured in these two studies. Berger and Sorokin defined solitary activity as a state when a person was not engaged in verbal

social interaction. This study defined it as a person's state when other persons were not present in the same room.

This investigation also found a compensatory relationship between social contact on the job and participation in solitary activities after work that was contradictory to the weak carry-over relationship reported by Meissner (1970). Other possible lines of further investigation of individual differences in solitary and social behavior were discussed in the preceding section on the limitations of this study.

The results of this investigation contribute to the understanding of the causes and consequences of differences in peoples' solitary and social behavior. They also contribute to the understanding of the relationship between peoples' work and non-work activities in urban environments. Although the possible inferences of this study are limited, the ideas considered are of basic concern to sociological theory. They have practical implications in that they question the assumptions used in designing our everyday living environments.

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