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Time Judgement and Use: the Role of Situational Intervening Factors

Abstract

Time perception and orientation are important concepts in the study of people's behavior. Two studies on the impact of situational conditions on consumers' temporal judgements are reported. In accordance with the first study's hypotheses, the data demonstrated that various situational events influence individuals' time perception and orientation. The second study investigated one situational factor – mood. Results demonstrated strong mood effects on subjects' temporal judgements. The findings were confirmed across two different mood-inducing manipulations and were interpreted as supporting the general theoretical foundation of the mediating roles of affective states on consumers' temporal judgments.

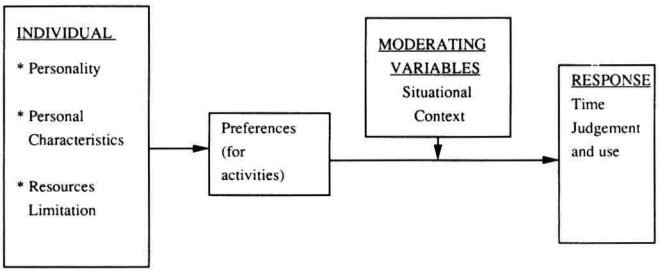
Introduction

Temporal considerations permeate people's everyday lives. These are primarily in three aspects: time allocation behavior, time perception and time orientation. First, the finite nature of time requires the individual to make choices among activities according to their perceived values (Gronau, 1977).
Second, people perceive time in various ways, and these perceptions affect their behavior in many ways (Graham, 1981). Third, individuals express different time orientation which signify the relative dominance of past, present, or future in their thoughts (Bird and Jordan, 1987). Overall, Etzioni (1988), suggested that time is much more a social than economic factor, and as such, might fall under the influence of moral judgements.
When making temporal judgements, consumers are frequently influenced by situational conditions that may mediate their subjective evaluations. The overall objective of this paper is to offer some conceptual guidance and empirical results linking situational variables to time. The paper presents two recent studies demonstrating that certain momentary conditions play a critical role in the process of time use, time perception and time orientation. The possible influence of general situational conditions on time use and judgement has been suggested by several writers (e.g., Fraisse, 1984; Schwarz et al., 1987), but empirical evidence linking the two factors is sparse.

Theoretical Framework

The manner in which people organize their daily activities has received increasing attention from researchers. Feldman and Hornik (1981) have developed a paradigm that classifies activities into temporal groupings. This paradigm has been derived largely from the "new" economic approach to consumer behavior (Elchardus, 1990) which has its modern roots in the work of Becker (1965) and used by various investigators (Arts 1990; Wunderink 1990). The classification contains four mutually exclusive time groupings (work, necessities, home work and leisure), suggesting that these activities differ in descending order on an obligatory-discretionary perceptual dimension. The individual time allocation decision between and within the groupings is shown by the model to be governed by interaction of the following sets of factors: (1) economic factors, representing resource limitations on money, time and space (Burgenmeire 1990); (2) personal attributes including socioeconomic/demographic characteristics; (3) subjective individual values expressed as preferences for activities (Knulst 1990); and (4) situational encounters, representing anticipatory or non-anticipatory events in the individuals life.

Figure 1 A Model of Situational Roles on Time Judgement and Use



Situationalism and Time

Researchers have not been notably successful in producing person-object relationships that may be considered "strong" or generalizeable. Attempts to explain this apparent lack of strong relationships have converged on the notion that the reliability of any person-object relationship is subject to situational influence. In other words, the same individual, given his or her sex, social class or score on a personality inventory, is likely to behave differently with respect to the same event or activity if the situations in which the temporal activity is encountered, differ in important ways. Furthermore, under certain circumstances, subjects' judgements of the apparent duration of an interval may be affected by the events occuring during that period and by the circumstances in which the subjects interact with those events. Belk (1975) identified five sets of factors which could be used in categorizing situations:

1. *Physical surroundings*, e.g., location, decor, sounds, lights, weather or similar physical stimuli;
2. *Social surroundings*, e.g., presence of other people, interpersonal interactions, etc.
3. *Temporal perspective*, e.g., the time of the day, the interactivity interval, time pressure, etc.
4. *Task definition*, e.g., purpose of the specific activity.
5. *Antecedent States*, e.g., mood, physical feelings, cash on hand, etc.

The five groups of factors appear to provide an exhaustive base for the study of most situations. Descriptions generated on the basis of this list could be applied to temporal situations.

Study I

By utilizing unique aspects of time diary data, notably self-reported data on time use at work and elsewhere, the first study evaluated the empirical relevance of situational and interactional aspects in time allocation behavior. The data used are from the University of Michigan's Survey Research Center study of "Time Use in Economic and Social Accounts". Time spent on each of the following four groupings was used as the dependent variables: work, necessities, home work and leisure. Three sets of independent variables were included: (a) Personal characteristics variables; (b) Reference measures based on responses to questions about the level of satisfaction with the selected activity and (c) four situational variables, which are the only situational measures available in the data, but all four were mentioned in other situational studies. These variables reflect situations that are encountered frequently in the consumption of time (and for which adequate sample sizes could be obtained). They reflect different kinds of situational conditions, including some salient features of situations: physical surroundings (presence of other people), and antecedent states (mood) (Table 1). The mood scaling was due to Nowlis (1965), and the emphasis is on the pri-

TABLE 1 Situations Independent Variables

Situations	No. of Codes	Range
High temperature on diary day	9	Below 25 degrees to 95+ degrees
Weather on diary day	6	No rain or snow to over 8 hours of rain or snow
Presence of other people	2	1 = Yes, 0 = otherwise
Mood on diary day	3	"In what way was yesterday an unusual day for you?" 0 = Good mood, 1 = Not unusual, 2 = Bad mood.

mary dimensions proposed by him.
Additive multiple regression analyses were conducted to assess the contributions and relationships of the three sets of explanatory variables to the four time groupings, where nominal variables entered as dummy variables.

Results of Study I

Discussions of regression results will concentrate on patterns across the four time groupings, based on the measure of time allocation (Table 2). For reasons of simplicity and ease of interpretation, only the adjusted R2 for the four time groups are presented in Table 2. The findings show an interesting pattern of relationships between the situational set and the four time groupings, a decrease in variance from work through necessities and home work to leisure. This decrease reflects differences in ranking of the four on a discretionary-obligatory scale. Thus, on the one hand we have the habitual, relatively inelastic activities like work in which the individual has little latitude in determining his/her time input and are, therefore, the activities least affected by situational events. At the other extreme are discretionary activities in which the person can exercise complete latitude. Since leisure is a sphere of life that is by its very nature free and uncommitted, any constraining situational events will simply eliminate leisure altogether, assuming the individual is willing to or capable of delaying gratification.

TABLE 2 Variances Accounted for by the Different Sources of Variance on the Four Time Groups

	Dependent Variables			
Independent Variables	Work	Necessities[a]	Home Work	Leisure
Person (P): Adj. R^2	.29[b]	.19[b]	.14[b]	.07[c]
Preference (F): Adj. R^2	.04	—	.09[c]	.12[b]
Situation (S): Adj. R^2	.02	.04	.07[c]	.13[b]
P × F: Adj. R^2	.18[b]	—	.05	.04
P × S: Adj. R^2	.03	.02	.03	.09[c]
F × S: Adj. R^2	.01	—	.12[b]	.24[b]
P × F × S: Adj. R^2	.04	—	.03	.05
Combined variables: Adj. R^2	.38[b]	.21[b]	.28[b]	.34[b]
S: ΔR^2	.02	.03	.06[c]	.10[b]
P × F: ΔR^2	.09[c]	—	.02	.02
P × S: ΔR^2	.00	.01	.01	.02
F × S: ΔR^2	.00	—	.10[b]	.18[b]

[a]Preference scores on necessities were not available in the data
[b]Significant at the 0.001 level
[c]Significant at the 0.05 level

Study II

The second study contains two experiments on the impact of temporary affective states on individuals' temporal judgements. Mood: A solid research foundation for the study of affect has been laid in the fields of social/cognitive psychology. Many studies (for reviews see Isen, 1989; Schwarz and Clore, 1983) have argued that evaluative judgements are subject to pronounced mood effects. Indeed, one of the more pervasive situational factors may be consumers' mood at the time of judgement. Mood generally is thought of as a mild affective state that may influence cognitive processes such as evaluation, memory and decision strategies (Gardner, 1985). Overall, behavior, judgement, estimation, recall and planning are more positive when people are in a good rather than a bad mood. Empirical evidence on subjects' duration estimates makes one point clear. People perceive duration of events subjectively (van Raaij 1990). But, the perceptual variations may be due to situational event (Hornik, 1982). One speculation of this observation is that different mood states may require different cognitive resources while evaluating events and may, therefore, produce some temporal distortions. More specifically, people in a bad mood, who experience their situation negatively, may wish time to pass quickly so the situation (or their mood) will improve. These people are expected to perceive events as lasting longer because they are paying more attention to the clock. Saying that time is passing slowly is essentially saying that it is unpleasant, and expressing impatience with the continuing experience of the (bad) situation. On the other hand, people in a positive mood, enjoying themselves and their current state may pay less attention to time, and when asked to estimate recent events, will respond that time seems to be passing more quickly.

It has also been suggested that individual preference for the past, present or future reflects not only stable inner states but is also subject to a variety of social factors (Etzioni 1990) and transient influences which may include mood (Rakowski, 1986).

Previous work on mood has led to the suggestion that sadness focuses attention on the aversiveness of one's situation (Schwarz and Clore, 1983). For the depressed, the future seems unreal, uncertain, and intangible; their concern, therefore, seems to be with present events and conditions that they are experiencing now, in the present. Happiness, on the other hand, it is suggested, produces a positive view of the environment: "In general, mood states seem to bias evaluations and judgements in mood-congruent directions. A positive mood may be associated with looking at the world through rose-colored glasses, while a negative mood may analogously color evaluations", (Gardner, 1985, p. 287).

Given that life is generally pleasant to the elated and pervasively unpleasant to the depressed, time itself should be positive or aversive, because it envelops the pleasant or unpleasant unfolding of life (Block, 1989). Specifically, positive affect can be expected to be associated with optimism, higher expectations for future events rather than dwelling on the past and being concerned with the present, and concomitantly, an increase in the cognitive resources available to execute planning tasks.

Experiment 1

The two experiments were part of a larger study on consumers' intertemporal choices and preferences. The first study used a Velten-like mood-inducing procedure (Velten, 1968) administered, in small groups, to 117 subjects. Subjects were randomly assigned to one of three experimental conditions: Velten elation (VE), Velten depression (VD), and Velten neutral (VN). Twenty-two additional subjects participated in a pretest session a few days earlier to verify mood manipulations. The pretest affect state of the subjects was measured by a mood-state instrument consisting of a series of seven-point bipolar scales employing a pretest procedure similar to that used by Kraiger, Billings and Isen (1987). *Procedure*: The experimental procedure included the following steps. At the beginning of the session each experimental group listened to the same lecture con-

cerning a recent business case, as part of the regular class program. The lecture took 12 minutes and dealt with the various facets of introducing a specific computer system to a large insurance company. Among the issues raised were questions of salesmen's time-management, supervisors' financial control, and decision-makers' long-range planning. Next, each group was subjected to the assigned Velten mood-inducing condition. At the end of the session subjects were told to turn to the paper and pencil tasks contained in a four-page questionnaire. The first page consisted of a series of questions on the lecture and case. The remaining questions served as part of the dependent measures. The second page consisted of the time estimation task. Here subjects were asked first to estimate the duration of the lecture and second the amount of time they had spent reading the cards. The subjects then turned to the last two pages which contained the time-orientation task.

Dependent Variables: Time perceptions were measured by using the verbal estimation procedures. Operationally, subjects were asked to estimate the two activities to the nearest minute. This was done to prevent the estimation of time in multiples of five minutes (Hornik, 1984).

Of the time orientation instruments suggested by researchers, the Time Reference Inventory (TRI) was used (Roos and Albers, 1965). The TRI is a 30-item paper and pencil instrument. Items refer to different life events, ten with a negative feeling tone, ten positive, and 10 neutral. Subjects are asked to indicate whether each event refers most appropriately to the past, present or future. *Results*: Sample time estimates produced an average difference between the perceived and actual time, for the lecture and card readings, of 8.9 percent and 7.6 percent underestimation, respectively. The distribution across treatments is presented in Table 3.

Results show that the VE group subjects exhibit a clear tendency to underestimate the duration of the two activities, whereas VD condition subjects tend slightly to overestimation.

Table 3 also compares the three conditions, separately for the two tested activities. The largest difference is between the positive and negative mood conditions. The differences between the positive and neutral groups are also significant. No differences were revealed between the negative and the neutral groups. These findings hold for both activities.

In sum, time perception is shifted from its normative baseline when the subjects' mood states are changed. Experiment I thus reveals a clear underestimation by the elated group and a slight overestimation by the depressed group.

To examine the influence of mood manipulations on time orientation, a one-way (VE vs. VD vs. VN conditions) multivariate analysis of

Table 3 Time Estimations by Mood States and Hypotheses Tests for Two Activities

Activities	Lecture (12 min)			Reading (7 min)		
Mood States*	Average (SD)	Percent Over(+), under(-)	Group Comparisons	Average (SD)	Percent Over(+), under(-)	Group Comparisons
VE (n=42)	9.26 (7.98)	(-)22.9	VE < VD[a]	5.61 (4.30)	(-)19.9	VE < VD[a]
VN (n=35)	11.48 (8.57)	(-)4.3	VE < VN[a]	6.76 (4.94)	(-)3.4	VE < VN[b]
VD (n=40)	12.19 (8.92)	(+)1.6	VD > VN[n.s.]	7.09 (5.38)	(+)1.3	VD > VN[n.s.]
Total, N=117	10.93	(-)8.9		6.47	(-)7.6	

*VE = Velten Elation; VN = Velten Neutral; VD = Velten Depression.

[a] $p < .001$; [b] $p < .05$.

variance was performed with numbers of future-orientation (FT), present-orientation (PT), and past-orientation (ST) subjects as multiple dependent measures. Results yielded a significant main effect for the mood-induction manipulations: multivariate F (3,114) = 4.59, p = .04; 4.48, p = .04 for the lecture and readings, respectively. Subsequent univariate analyses revealed that subjects in the VE condition reported significantly more future orientation than did subjects in the VD group (Ms = 6.35, 2.69), F(1,80) = 8.41, p = .007, and subjects in the neutral condition (Ms = 6.35, 4.46), F(1.73) = 5.37, p = .015. Also, subjects in the VD condition reported significantly more present orientation and past orientation than did subjects in the VE condition: (Ms = 5.28, 1.83), F(1.80) = 7.91, p = .005; (Ms = 4.91, 2.33), F(1.80) = 5.66, p = .03, respectively. However, no differences were apparent between the VD and the VN group for future and past orientation (P > .10), while the differences between the VD and VN groups for present orientation were in the predicted direction but not at a statistically significant level (P = .11).

Experiment 2

The second experiment was also administered to adult students but during the winter 1988 semester at the Tel Aviv business extension program (M = 30.5 yrs., SD = 9.9). One hundred and six students took part in three film sessions, in accordance with the Goldberg and Gorn (1987) procedure. Nineteen additional subjects participated in a pretest session to verify mood manipulations. Positive, negative and neutral affects were manipulated by using three different short films (2.5 to 3 minutes each) for each condition, screened on television monitors prior to the paper and pencil task. The films were selected from 32 short sequences taken from local television shows and newscasts, and represented comic, tragic and neutral appeals. A panel of five film experts and senior account executives reviewed all the films and followed the commonly used judges-experts evaluation procedure. The research setting and experimental procedure used in Experiment 2 were very similar to those of Experiment 1. *Results*: The data for the first dependent variable are presented in Table 4. The figures show that the positive-mood group clearly underestimated the duration of the lecture and film. On the other hand, the negative-mood condition produced a small overestimation for the lecture (2.3 percent) and a small (1.9 percent) underestimation for the film.

Testing for the mean differences among the three experimental groups across the two activities produced the results also depicted in Table 4. As in Experiment 1, the largest difference is between the positive and negative groups. In fact, the time estimation findings of Experiment 2 replicate the trend demonstrated in Experiment 1. The only notable difference is that the film session produced a moderately (marginally significant) smaller underestimation by the negative-mood group compared to the neutral group.

Objective scoring of the TRI yielded the number of positive, negative, and neutral items referring to the past, present, and future orientations. The one-way multivariate analysis of variance produced a significant main effect for the mood-induction manipulation: multivariate F(3,103) = (4.40; 3.87), p < .03, for the lecture and film, respectively. The univariate analyses showed that subjects in the positive condition scored significantly more on the future orientation items than did subjects in the negative and neutral conditions. These trends are very similar to those of Experiment 1. Similar results were also obtained for the negative-mood group on the present orientation subscales.

Discussion

The findings of the two studies have both theoretical and practical value. Theoretically, they increase our understanding of time judgement and use under varying situational conditions. It can be stated generally that the data of the first study indicate that the less the degree of

Table 4 Time Estimations by Mood States and Hypotheses Tests for Two Activities

Activities	Lecture (12 min)			Film (8.5 min)		
Mood States*	Average (SD)	Percent Over(+), under(-)	Group Comparisons	Average (SD)	Percent Over(+), under(-)	Group Comparisons
PS (n=40)	9.07 (7.85)	(-)24.4	PS < NG[a]	6.23 (5.71)	(-)26.7	PS < NG[a]
NU (n=29)	11.68 (9.24)	(-)2.7	PS < NU[a]	7.68 (6.53)	(-)9.6	PS < NU[b]
NG (n=37)	12.28 (9.57)	(+)2.3	NG > NU[n.s.]	8.34 (7.44)	(-)1.9	NG > NU[c]
Total, N=106	10.90	(-)5.5		7.36	(-)13.4	

*PS = Positive Mood; NU = Neutral Mood; NG = Negative Mood.

[a] $p < .001$; [b] $p < .05$; [c] marginally significant, $p < .10$.

obligation imposed by an event or activity, the more important are situational influences. The second study definitely demonstrates the link between monetary internal mood states and temporal judgements.

The two experiments provide further empirical support for the notion that people perceive time as passing more quickly when they are elated than when they are in either a depressed or a neutral affective state. These differences may be due to the observation that people in a positive mood are more interested in the situation and pay less attention to time, whereas people in a negative mood are more concerned with time and less with the situation.

The relationships found between mood and time orientation suggest that people in a positive mood tend to be more optimistic and future oriented. On the other hand, results indicate that sad people may be more pessimistic and feel that future consequences are so far removed that they cannot reasonable be counted on to occur.

The implications of the results are several. First, whenever subjects are required to record their temporal judgements, it is essential also to examine or control for their mood state at the time of testing. For example, given that life-style research consist of many activities and time-orientation items, our results suggest that an attempt must be made to account for possible mood affect on results. Second, the most commonly used method of measuring individuals' activities is the time-budget technique. This research method, however, has shown conflicting results. It is quite possible that mood might have acted as a situational factor. Third, the time-situation link might partially explain the decline in savings (Maital and Maital 1990; Warneryd 1990) suggesting that the marginal rate of time preference (the subjective premium attached to present consumption compared to that in the future), might be influenced by momentary situations like mood.

Fourth, since time is considered an integral element of any behavior, research into the way their mood influences individuals' temporal orientation can be an important aspect to planners of specific activities. This might be useful in areas such as leisure and recreation services, public health, work conselling, personal enrichment programs, and in the planning of many goods and services that are clear substitutes or complements in the individual's time (van Raaij 1990). Finally, further work is necessary to elucidate the process that underlie the observed effects of situational conditions on time judgment as compared to, for example, individual and personality factors.

Reply to Discussant Comments

Professor Maarten Vendrik raised two major issues while commenting on the paper. First, a

possible demand effect on the experimental manipulations of mood. Second, the ethical implications of manipulating subjects' moods and the possible misuse of results by managers.

The following are my replies: The various concerns raised by Professor Vendrik enable the author to revise certain parts of the paper and develop new ideas for further investigations. For the two above comments first, one has to note that the usual restrictions of laboratory research apply also here. The subjects were placed in an environment that, despite the extreme caution taken in both experiments, may have implicitly facilitated a demand effect. The findings therefore, must be viewed in the proper perspective.

Second, because the experiements used mood manipulations, its use is of some ethical as well as practical concern. Although a common practice in experimental procedures is to manipulate subjects my feeling is that the ethical issue is paramount here, particularly in terms of unethical applications based on the results. The issue is of degree, and therefore reasonable and ethical manipulation should be used to advance our theoretical knowledge. Also, managers should manipulate mood in a way that fully ensures ethics.

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