

# Consumers' Response to Waiting Time: New Segmentation Bases Are Required for Service Industries

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## ABSTRACT

The objective of this research was to investigate the effect of two individual characteristics namely the circadian orientation and Type A/B behavior pattern on consumers' responses to waiting time in service settings. A first exploratory study (n=34) showed that both characteristics induced differences in consumers' emotional responses and tolerance level to delays. In study 2, taxonomic analyses were used to demonstrate that consumers could be empirically segmented according to their circadian orientation. Implications for segmentation strategy in service industries are discussed.

## INTRODUCTION

In our post-modern society, time has become one of consumers' scarcest resources. As a result, the amount of time used and saved in purchasing and consuming products and services is now a critical factor in consumer choice (Kaufman et al. 1991; Marmorstein et al. 1992). In services, consumers' concern for saving time has not only involved design modifications but has also forced many industries such as banking and supermarkets to deliver services around the clock (Kelley 1989). Just think about products such as eyeglasses or rolls of film for which the processing time has been cut from days to minutes.

Yet, no systematic attempt has been made to categorize consumers on the basis of their reaction to time. Pinpointing time-related preferences of segments of consumers and designing products or services accordingly may well be a neglected weapon to gain a competitive edge in service industries. In this paper, we focus on consumers' reactions to waiting time in services. We investigated two individual characteristics - circadian orientation and Type A/B behavior pattern - whose effects are likely to influence consumers' response to waiting time. We first provide the theoretical rationale for these effects and then report a study that provides preliminary evidence. Finally, in a second study, segments of consumers presenting different circadian orientations are empirically identified using taxonomic methods.

## REVIEW OF THE LITERATURE

### Individual differences in consumers' response to waiting time

Among the many individual differences that have been studied in psychology and consumer behavior, we have selected circadian orientation and Type A/B behavior pattern. Both characteristics have been shown to influence variables such as cognitive performance (Horne et al. 1980; Juszczak and Andreassi 1987; Matthews 1982), arousal (Matthews 1988), mood (Patakai 1971; Strube and Lott 1984), and time perception (Burnam et al. 1975; Thor 1962). According to recent psychological theories about memory for temporal information and duration estimation, these variables may be mediators of consumers' response to waiting time (Block 1989; Zakay 1989; see Zakay and Hornik 1991 for an application of these theories to consumers' response to waiting). Thus, both circadian orientation and Type A/B behavior pattern are most likely to impact on consumers' response to waiting time. In this section, we briefly review findings on circadian orientation and Type A/B behavior that bear on consumers' response to waiting time.

### Circadian orientation

A number of studies in chronobiology have demonstrated the impact of circadian cycles on individuals. Circadian cycles refer to the day-night cycles that create, within each individual, an internal rhythm, called circadian clock. This phenomenon has been a topic of interest in various disciplines mainly because of its stability and influence (Aschoff 1984). These cycles can be predicted, occur at regular intervals and have an impact on human behavior during day and night. Influences on physiological functions such as body temperature or basal metabolism have been demonstrated (Aschoff 1984, 1989).

However, results of many research have shown that circadian cycles were not affecting everyone at the same time of the day. Interindividual differences, called circadian orientation, were recognized and further operationalized in the concept of Morning and Evening types. More specifically, studies have indicated arousal peak level differences related to Morning/Evening types. The Morning type energetic peak, called arousal acrophase, would be somewhere between the morning and the beginning of the afternoon while the Evening type acrophase would be somewhere between the end of the afternoon and the beginning of the evening (Akerstedt and Froberg 1976; Foret et al. 1982; Kerkhof 1985; Matthews 1988; Patakai 1971). In relation with time estimation, it has also been demonstrated that Evening and Morning types estimation of small time intervals (less than 2 minutes) fluctuated according to the time of the day (Thor 1962).

### Type A/B behavior pattern

The construct of Type A/B behavior pattern has been introduced by Friedman and Rosenman in studies in which the role of specific behavior patterns was related to the development of coronary heart disease (Jenkins et al. 1979). The most critical characteristics of Type A individuals are competitiveness, achievement striving, aggressiveness and easily aroused hostility. Type As also show a sense of time urgency. Individuals who exhibit a Type B behavior pattern are described as being more relaxed and having an easy-going life-style (Jenkins et al. 1979).

Type As' concern for time urgency has been said to be the only evident behavior present in all Type As (Mueser et al. 1987). These individuals are impatient, constantly struggle to achieve more in less time and are continually striving to avoid loss of control over their environment (Krantk et al. 1974). With respect to time perception, Burnam et al. (1975) conducted a study in which Type As and Type Bs were required to read aloud a technical article during 60 seconds. Type As underestimated the passage of the minute (52.6 sec.) while Type Bs overestimated the same interval (75.0 sec.). However, neither Warner and Block (1984) nor Retzlaff (1982) obtained results to confirm these findings. Different time periods and level of activity during the experiment may explain the different results (Retzlaff 1982; Warner and Block 1984).

The association of time urgency with Type As has also been explored in a study in which the perceived appropriateness of time adjectives was examined (Mueser et al. 1987). The study revealed that Type As rated low speed and energy adjectives as inappropriate time descriptors while Type Bs rated them as appropriate time descriptors.

In sum, past research on both circadian orientation and on Type A/B behavior pattern suggests that individuals presenting different levels of these characteristics are likely to differ in their tolerance level and emotional responses when facing an unexpected waiting time. An exploratory study was conducted to investigate these issues.

## STUDY 1

### Overview

The study was designed as a preliminary test of the effect of circadian orientation and Type A/B behavior pattern on consumers' response to waiting. Subjects were asked to indicate their emotional responses and tolerance levels to scenarios of unexpected delays. Their individual circadian orientation and behavior pattern were assessed with standardized tools.

### Method

Subjects were 34 undergraduate anglophone students in an eastern Canadian Business School. They participated in the study on a voluntary basis. The study was presented as part of a research on consumers' individual characteristics and was conducted in a group session at 10:15 a.m.

### Independent variables

*Circadian orientation:* The Smith et al. (1989) morningness questionnaire including 13 items was used to classify subjects as Morning or Evening types. This latest English version of morningness questionnaire is a composite scale that includes the best of three previous morningness questionnaires (Folkard et al. 1979; Horne and Ostberg 1976; Torsvall and Akerstedt 1980). A median split on the total score was used to identify Morning and Evening types.

*Type A/B behavior pattern:* Following Matthews (1982), Strube et al. (1986) and Feather and Volkmer (1988), subjects were classified as Type As or Type Bs on the basis of the short form of the student version of the Jenkins Activity Survey (SJAS). The SJAS version has been modeled after the adult version (Zyzanski and Jenkins 1970) to suit an academic context (Glass 1977). A slightly modified short form of the SJAS was used. This short form of the SJAS is limited to the speed/impatience and hard-driving/competitive factors. It has been found to give a satisfactory internal consistency, an excellent test-retest reliability (Yarnold et al. 1986) as well as a criterion-related validity (Yarnold et al. 1987).

### Dependent variables

*Emotional response to delays:* Subjects were asked to imagine that they were waiting in situations commonly encountered in service settings. Because it could be assumed that our subjects would have had a reasonable amount of personal experience with such situations, they were likely to be reliable informants of their behavior in similar real-life situations (Schmitt, Dubé, Leclerc 1992). For *situation specific responses*, subjects were asked to imagine themselves in the following situations: having missed a bus, being unable to get a cab, waiting for a phone call. On a 9-point scale, they were asked to indicate how upsetting they found each of these situations (1=not at all, 9=very upsetting). For *general emotional response*, subjects were asked to indicate how angry they were when they have to face unexpected delays in general (1=not at all, 9=very angry).

*Tolerance to unexpected delay:* Subjects were asked to imagine having dinner at a restaurant and to indicate how they would react to an unexpected delay in the service. The following scenario was given:

"Suppose you are in a restaurant and you are told that you have to wait for fifteen minutes before you will be seated. How soon after the end of the expected delay will you get restless?"

Subjects indicated their responses to this pre-process delay in minutes. Because consumers' responses to waiting time have been shown to vary as a function of the phase in the service delivery process (Dubé, Schmitt and Leclerc 1989, 1991), we also ask subjects to indicate their reactions to a 15 minutes delay occurring as they were waiting for the main course (within-process) and for the check (post-process).

### Results

#### *Reliability of the scales*

The alpha coefficient for the 13-items circadian orientation scale was 0.81. The alpha coefficient for the overall SJAS scale was 0.72 (15 items). Alpha coefficients were also computed for the speed/impatience subscale ( $\alpha=0.69$ , 4 items) and for the hard-driving/competitive subscale ( $\alpha=0.81$ , 5 items).

The three emotional responses to waiting times presented a good reliability ( $\alpha=0.73$ ) and an average score was computed. The three items related to the tolerance to unexpected delay presented an alpha coefficient of 0.75. An average score was also computed.

#### *Effects of circadian orientation and behavior pattern*

In order to investigate the effect of the two personality characteristics on consumers' response to waiting time, a series of mean comparisons (t-test with pooled variance estimate) were conducted on the three dependent variables (emotional responses to specific situations, general emotional response, and tolerance to unexpected delay) between sub-groups formed for each characteristic. For Type A/B behavior pattern, sub-groups were formed for the overall scale and also for sub-scales of speed/impatience and hard-driving/competitive. Means are presented in Table 1 for circadian orientation and Type A/B behavior pattern classified on the speed/impatience sub-scale.

*Effect of circadian orientation:* Results show that individuals with an Evening type orientation demonstrated a more negative emotional response when they encountered unexpected waiting time in service situations (M: Morning= 5.00; M: Evening= 6.14;  $T[32]=2.22$ ;  $p<.05$ ).

With respect to the amount of time they could tolerate an unexpected delay before getting upset, Evening and Morning types did not differ significantly although differences tend to appear at the post-process phase (M: Morning=5.77 min.; M: Evening=7.82 min.;  $p<.03$ ). Interestingly, for Morning types, tolerance to waiting time varied as a function of the phase of the process. They were willing to wait a shorter period of time when the unexpected delay occurred at the post-process phase (5.77 min.) than when it occurred at the pre-process (10.35 min.) or in-process phase (9.82 min.) (mean comparisons: post and pre-process:  $T[16]=3.12$ ;  $p<.05$ ; post and in-process:  $T[16]=2.43$ ;  $p<.05$ ). The same trend was observed for the Evening type although the differences did not reach significance level (all  $ps > 0.3$ ).

*Effect of Type A/B behavior pattern:* Means comparisons for subjects classified as Type A/B on the basis of the overall SJAS scale and on the hard-driving/competitive sub-scale did not show any significant differences in consumers' response to waiting time. However, individuals categorized as Type A or B on the basis of the speed/impatience sub-scale did show important differences in the dependent variables. Type As were significantly more upset than Type Bs when facing unexpected delay in specific service delivery environments (Type A=6.10; Type B=5.09;  $T[32]=-1.94$ ;  $p<.07$ ).

TABLE 1

Emotional responses and tolerance to waiting time as a function of circadian orientation and Type A/B behavior pattern

	Circadian orientation		Behavior pattern	
	Morning	Evening	Type A	Type B
Emotional responses				
situation specific	5.00a	6.14b*	6.10a	5.09b**
general response	5.18a	5.24a	5.75a	4.72b**
Tolerance				
overall	8.65 <sup>a</sup>	8.80 <sup>a</sup>	7.06 <sup>a</sup>	10.20 <sup>b**</sup>
pre-process	10.35 <sup>a</sup>	9.29 <sup>a</sup>	8.44 <sup>a</sup>	11.06 <sup>a</sup>
within-process	9.82 <sup>a</sup>	9.29 <sup>a</sup>	7.00 <sup>a</sup>	11.83 <sup>b*</sup>
post-process	5.77 <sup>a</sup>	7.82 <sup>a</sup>	5.75 <sup>a</sup>	7.72 <sup>a</sup>

Note: Comparisons are made rowwise within each individual characteristic for means with different subscripts.

\* Means with different subscripts are significantly different at  $p < 0.05$

\*\* Means with different subscripts are significantly different at  $p < 0.10$

Type As also indicated that their usual emotional reaction to unexpected delay was significantly more negative than Type Bs (Type A= 5.75; Type B= 4.72;  $T[32]=-1.84$ ;  $p<0.08$ ).

With respect to their tolerance level to unexpected delay, across all three phases of the process, Type As were willing to wait for a shorter period of time than Type Bs (Type A= 7.06 min; Type B= 10.20 min.;  $T[32]=2.00$ ;  $p<0.06$ ). When separate analyses were conducted for the three different phases of the service process, Type As were significantly less tolerant than Type Bs only at the within-process phase (Type A= 7.00 min.; Type B= 11.83 min.;  $T[32]=2.29$ ;  $p<0.05$ ). Finally, we found that both Type As and Type Bs manifested significant differences in their tolerance level to unexpected delay as a function of the phase of the process in which they occur. At a marginal level, Type As were less tolerant to delays in the post-process (5.75 min.) than in the pre-process phase (8.44 min.) (mean comparisons:  $T[15]=1.76$ ;  $p<.10$ ). Type Bs were also less tolerant in the post-process phase (7.72 min.) compared to the within-process (11.83 min.) (mean comparisons:  $T[17]= 2.61$ ;  $p<.05$ ) or pre-process phase (11.06 min.) (mean comparisons:  $T[17]=2.20$ ;  $p<.05$ ).

**Discussion**

The results of this first study suggest that consumers presenting different circadian orientation and type of behavior pattern would respond differently to waiting situations. Type A/B behavior pattern induced differences in both emotional and tolerance responses to waiting. Individuals who scored high on the speed/impatience subscale responded more negatively to unexpected delay and they would wait a shorter period of time before getting upset. Further research should replicate these effects and investigate their underlying mediators.

Turning to circadian orientation, Evening type individuals, compared to Morning types, demonstrated a more negative emotional response to unexpected delay. Does this effect reflect a more general negative affective state for Evening type or is it related to the time of the day when the study was conducted (10:15 a.m.)? Kleitman (1963) has suggested that Evening types may, in general, be in a more negative affective state due to the fact that their diurnal rhythm of sleep and wakefulness does not conform to the habits of the majority of the population. Patkai (1971) also found that a series of negative feelings (gloomy, morose, dispirited) were reported only by Evening types. However, in Patkai's study, Evening types

expressed these negative feelings only when the reports were made in the morning. In our study, even though we did not manipulate the time of the day when the delay occurred, it may be that subjects naturally took into account the actual time when they completed the questionnaire. This could explain why significant effect were found only for situation-specific measures. Further research should systematically investigate the effect of circadian orientation on consumers' reactions to unexpected delays occurring at different times of the day.

In sum, the results of this study suggest that both circadian orientation and Type A/B behavior may be valuable segmentation bases for service industries. If these preliminary results on time related differences among consumers are confirmed, service providers may seek to redesign part of their service operations to suit specific needs and wants of the target segments. Moreover, specific training programs could be planned to help contact personnel to recognize patterns of behavior expressed by each segment and to adopt appropriate roles during the individual service encounter. Service industries might also adapt their communication strategy with messages emphasizing time concern attributes (time saving procedures, round the clock service, home service, etc.) or emotional response to delay. Thus, it would become important to empirically identify segments on the basis of these two characteristics. In study 2, we used taxonomic analyses to classify segments of consumers presenting different circadian orientations.

**STUDY 2**

**Overview**

This second experiment was part of a larger project on service quality in the banking industry. Subjects were asked to complete the Smith et al. (1989) questionnaire on circadian orientation. They were classified as being either Morning or Evening type using cluster and discriminant analyses.

**Method**

Subjects were 219 undergraduate francophone students in an eastern Canadian Business School who volunteered for the study. Subjects were run in groups of 20 to 30 in a class setting. The study was presented as a research on consumer behavior in banks. The english version of the scale was translated in french and validated using back translation. It was completed by the subjects at the

**TABLE 2**  
Means of individual items of the circadian orientation scale for each cluster - Study 2

	Cluster 1	Cluster 2
1. Rising time without constraints *	2.31	3.19
2. Bed time without constraints *	2.32	2.93
3. Ease to get up	2.07	2.81
4. Morning alertness	2.11	2.68
5. Morning feeling of tiredness	2.30	2.94
6. Physical performance (7 - 8 a.m.)	2.51	3.23
7. Evening hour of tiredness *	2.93	3.15
8. Preferred time for intellectual test	2.32	3.41
9. Self perception of M/E type	1.70	3.00
10. Rising hour preference	1.60	2.67
11. Pleasantness with 6:00 a.m. rising	1.95	2.86
12. Time required to recover	3.35	3.68
13. Self perception of M/E activity	1.80	3.04

Note: Means are presented prior to data standardization. Standardized means are significant at  $p < 0.0005$  for each variable except for the item # 7.

\* Items measured on 5-point scale. Otherwise items were measured on 4-point scale.

**TABLE 3**  
Predicted vs observed categorization as a function of circadian orientation - Study 2

Actual groups	n	Predicted group membership	
		Group 1 Evening	Group 2 Morning
1 (Evening)	78	77 98.7%	1 1.3%
2 (Morning)	134	13 9.7%	121 90.3%

beginning of the experimental session. Half of the subjects completed the questionnaire at 10:00 a.m. and the other half at 7:00 p.m.

#### Analysis

As a statistical method of classification, cluster analysis has been used in marketing to create market segments or groups of subjects along several personality and decision behavior characteristics (Punj and Stewart 1983). Quick Cluster analysis was conducted on measures of circadian orientation collected with the Smith et al. instrument, specifying that two clusters of subjects were to be found.

The 13 items of the scale were considered to be interval-scale measures. Standardized scores were computed to allow for comparison between 4 and 5-point scales. The cluster analysis retained 212 subjects and classified 65 individuals in the first cluster and 147 in the second. The interpretation of the means of the independent variables indicated that the first cluster included the Evening types and the second cluster included the Morning types (Table 2).

To validate the cluster solution, analysis of variance and discriminant analysis were conducted (Klastorin 1983). The analysis of variance confirmed that variable means were statistically different between each cluster for 12 of the 13 variables ( $p < 0.005$ ).

Prior to conducting the discriminant analysis, the correlation matrix was examined and showed that correlations among the

variables were low to moderate, the largest correlation coefficient being 0.55. The Box's M test confirmed the equality of the group covariance matrices (Box-M=90.294;  $p < 0.05$ ). A stepwise method based on Mahalanobis' distance selected 10 variables to be included in the discriminant function (Norusis 1990). The function discriminated significantly between the two groups (chi-squared=201.77;  $df = 10$ ;  $p < 0.0005$ ) and correctly classified 93.87% of the subjects (Table 3). Results of study 2 confirmed the capacity of the Smith et al. questionnaire to classify segments of consumers upon their circadian orientation.

#### CONCLUSION

Results of Study 1 suggest that specific circadian orientation or behavior pattern induce different responses to waiting. Furthermore, Study 2, demonstrated that segments of consumers presenting different circadian orientation can be empirically identified. These time related segmentation variables may help service operations position themselves on innovative bases, focusing on attributes that are particularly critical for different consumer markets.

Further research should provide a more precise understanding of how consumers react to waiting in service delivery environments and could also correlate these individuals characteristics to other aspects of consumer behavior in services. Such studies would

our very limited knowledge in the specific area of consumer behavior in the service industries.

## REFERENCES

- Akerstedt, T. and J.E. Froberg (1976), "Interindividual Differences in Circadian Patterns of Catecholamine Excretion, Body Temperature, Performance, and Subjective Arousal," *Biological Psychology*, 4, 277-292.
- Aschoff, Jürgen (1989), "Temporal Orientation: Circadian Clocks in Animals and Humans," *Animal Behavior*, 37, 881-896.
- Aschoff, Jürgen (1984), "Circadian Timing," *Annals New York Academy of Sciences*, 423, 442-468.
- Block, R.A. (1989), "Experiencing and Remembering Time: Affordance, Context and Cognition" in I. Levin and D. Zakay (eds.) *Time and Human Cognition: A Life Span Perspective*, Amsterdam, North Holland.
- Bumam, A., Pennebaker, J.W. and D.C. Glass (1975), "Time Consciousness, Achievement Striving, and the Type A Coronary-Prone Behavior Pattern," *Journal of Abnormal Psychology*, 84(1), 76-79.
- Dubé, L., Schmitt, B.H., Leclerc, F. (1991), "Consumers' affective Responses to Delays at Different Phases of a Service Delivery" *Journal of Applied Social Psychology*, 20, 810-820.
- Dubé, L., Schmitt, B. H., Leclerc, F. (1989), "When Delays Affect the Perception of Service Quality," in Srull T.K. *Advances in Consumer Research*, 16 (ed.), Ann Harbor, MI: Association for Consumer Research, 112-125.
- Feather, N.T. and R.E. Volkmer (1988), "Preference for Situations Involving Effort, Time Pressure, and Feedback in Relation to Type A Behavior, Locus of Control, and Test Anxiety," *Journal of Personality and Social Psychology*, 55(2), 266-271.
- Folkard, Simon et al. (1979), "Towards a Predictive Tools of Adjustment to Shift Work," *Ergonomics*, 22, 79-91.
- Foret, Jean et al. (1982), "Sleep Schedules and Peak Times of Oral Temperature and Alertness in Morning and Evening 'types'," *Ergonomics*, 25, 821-827.
- Glass, D.C. (1977). *Behavior patterns, stress, and coronary disease*. Hillsdale, N.J. Erlbaum.
- Horne, J.A. et al. (1980), "Circadian Performance Differences Between Morning and Evening 'types'," *Ergonomics*, 23 (1), 29-36.
- Horne, J.A. and O. Ostberg (1976), "A Self-Assessment Questionnaire to Determine Morningness-Eveningness in Human Circadian Rhythms," *International Journal of Chronobiology*, 4, 97-110.
- Jenkins, C.D., Zyzanski, S.J. and R.H. Rosenman (1979). *Jenkins Activity Survey*. The Psychological Corporation, 31 p.
- Juszczyk, N.M. and J.L. Andreassi (1987), "Performance and Physiological Responses of Type A and Type B Individuals During a Cognitive and Perceptual-Motor Task," *International Journal of Psychophysiology*, 5, 81-89.
- Kaufman, C.F. et al. (1991), "Exploring More than 24 Hours a Day: A Preliminary Investigation of Polychronic Time Use," *Journal of Consumer Research*, 18 (december), 392-401.
- Kelley, Scott W. (1989), "Efficiency in Service Delivery: Technological or Humanistic Approaches?," *The Journal of Services Marketing*, 3 (summer), 43-50.
- Kerkhof, Gerard A. (1985), "Inter-Individual Differences in the Human Circadian System: A Review," *Biological Psychology*, 20, 83-112.
- Klastorin, T.D. (1983), "Assessing Cluster Analysis Results," *Journal of Marketing Research*, 20 (february), 92-98.
- Kleitman, N. (1963). *Sleep and Wakefulness*. Chicago. Univer. Chicago Press.
- Krantz, D.S., Glass, D.C. and M. L. Snyder (1974), "Helplessness, Stress Level, and the Coronary-Prone Behavior Pattern," *Journal of Experimental Social Psychology*, 10, 284-300.
- Marmorstein, H. et al. (1992), "The Value of Time Spent in Price-Comparison Shopping: Survey and Experimental Evidence," *Journal of Consumer Research*, 19 (june), 52-61.
- Matthews, Gerald (1988), "Morningness-Eveningness as a Dimension of Personality: Trait, State, and Psychophysiological Correlates," *European Journal of Personality*, 2, 277-293.
- Matthews, Karen A. (1982), "Psychological Perspectives on the Type A Behavior Pattern," *Psychological Bulletin*, 91 (2), 293-323.
- Mueser, K.T., Yarnold, P.R. and F.B. Bryant (1987), "Type A Behavior and Time Urgency: Perception of Time Adjectives," *The British Psychological Society*, 267-269.
- Norusis, Marija J. (1990). *SPSS Advanced Statistics Student Guide*. Marketing Department, SPSS Inc, Chicago.
- Patkai, Paula (1971), "Interindividual Differences in Diurnal Variations in Alertness, Performance, and Adrenaline Excretion," *Acta physiol. scand.*, 81, 35-46.
- Punj, G. and D.W. Stewart (1983), "Cluster Analysis in Marketing Research: Review and Suggestions for Application," *Journal of Marketing Research*, 20 (may), 134-148.
- Retzlaff, Paul D. (1982), "Verbal Estimation, Production, and Reproduction of Time Intervals by Type A Individuals," *Perceptual and Motor Skills*, 55, 331-334.
- Schmitt, B. H., Dubé, L. and F. Leclerc (1992), "Consumers' Reactions to Delay while Waiting in Queues: Individual Costs and Moral Outrage as Determinants of Affective and Behavioral Responses," *Journal of Personality and Social Psychology*
- Smith, Carlla S., Reilly, C. and K. Midkiff (1989), "Evaluation of Three Circadian Rhythm Questionnaires With Suggestions for an Improved Measure of Morningness," *Journal of Applied Psychology*, 74 (5), 728-738.
- Strube, M.J. et al. (1986), "Self-Schematic Representation of Type A and B Behavior Patterns," *Journal of Personality and Social Psychology*, 51(1), 170-180.
- Strube, M.J. and C.L. Lott (1984), "Time Urgency and the Type A Behavior Pattern: Implications for Time Investment and Psychological Entrapment," *Journal of Research in Personality*, 18, 395-409.
- Thor, Donald H. (1962), "Diurnal Variability in Time Estimation," *Perceptual and Motor Skills*, 15, 451-454.
- Torsvall, L. et Akerstedt, T. (1980), "A Diurnal Type Scale," *Scandinavian Journal of Work and Environmental Health*, 6, 282-290.
- Warner, D.J. and R.A. Block (1984), "Type A Behavior and Temporal Judgment," *Bulletin of the Psychonomic Society*, 22(3), 163-166.
- Yarnold, P.R., F.B. Bryant and L.G. Frimm (1987), "Comparing the Long and Short Forms of the Student Version of the Jenkins Activity Survey," *Journal of Behavioral Medicine*, 10 (1), 75-90.
- Yarnold, P.R., Mueser K.T., Grau B.W. and L.G. Grimm (1986), "The Reliability of the Student Version of the Jenkins Activity Survey," *Journal of Behavioral Medicine*, 9 (4), 401-414.

- Zakay, D. (1989), "Subjective Time and Attentional Resource Allocation: An Integrated Model of Time Estimation" in I. Levin & D. Zakay (eds.) *Time and human cognition a life-span perspective* pp. 365-377, Elsevier Science Publishers.
- Zakay D., and J. Hornik (1991), "How Much Time Did you Wait in Line? A Time Perception Perspective" in (eds Chebat J.C. and V. Venkatesan) *Time and Consumer Behavior*, Montreal.
- Zyzanski, S.J. and Jenkins C.D. (1970), "Basic Dimensions Within the Coronary-prone Behavior Pattern," *Journal of Chronical Disease*, 22, 781-795.