(Waiting) Time Flies When the Tune Flows: Music Influences Affective Responses to Waiting By Changing the Subjective Experience of Passing Time

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ABSTRACT

Researchers often focus on perceived (i.e. estimated) duration or deviations from expected duration when examining the effects of atmospheric music on waiting and customer satisfaction. Comparatively little attention has been given to whether an interval feels as though it has “dragged” on versus “flown” by compared to the normal pace of time passage. In a laboratory experiment, subjects waiting for an important event to begin reported more negative affective states when disliked rather than liked music was played during the interval. This effect was completely mediated by their subjective experience of the interval as having passed more slowly or quickly than usual when disliked versus liked music was played, respectively, whereas neither deviations from their expected waiting time nor estimates of actual duration were related to reported affective states.

INTRODUCTION

Previous research has found that perceived waiting time is negatively correlated with overall satisfaction in customer settings as diverse as restaurants (Jones and Peppiatt 1996; Davis and Heineke 1998), supermarkets (Tom and Lucey 1997), video rental stores (Evangelist et al. 2002), banks (Houston, Bettencourt and Wenger 1998), emergency healthcare (Dansky and Miles 1997), general healthcare (Pruyn and Smidts 1998), and airlines (Taylor 1994). Presumably, consumers get annoyed when they have to wait for an extended period (Houston et al. 1998), so longer waits are associated with lower levels of satisfaction (Cameron et al. 2003). The marketing literature has made the distinction between perceived duration and actual duration, and researchers have explored how commercial environments influence the perceived duration of a given interval apart from its duration as measured by a clock or watch (Bailey and Areni 2006; Hornik 1984; Haynes 1990; Taylor 1994; Hui and Tse 1996).

However, most conceptualizations of perceived duration have either involved estimates of the interval in standard time units (Jones and Peppiatt 1996; Dansky and Miles 1997; Evangelist et al. 2002), measures of duration relative to some context-specific expectation (Hedges, Trout and Magnusson 2002; Boudreaux, Mandy and Wood 2003), and/or some combination of the two (Taylor 1994; Tom and Lucy 1997; Davis and Heinke 1998; Houston, Bettencourt and Wenger 1998; Pruyn and Smidts 1998; Roper and Manela 2000; Hedges et al. 2002). These kinds of measures have produced mixed results, sometimes resulting in a direct negative relationship between perceived duration and satisfaction as noted above, sometimes an indirect negative relationship (Pruyn and Smidts 1998; Evangelist et al. 2002), and other times no relationship at all (Boudreaux et al. 2003).

The research reported here posits that an interval may seem long not because it is long or because it is longer than expected given the context, but because time seems to pass more slowly than usual even though the actual duration may be known. Although the first two possibilities have been examined in detail, no research has examined the relationship between whether a given waiting period feels as though it has passed more quickly or slowly than usual and resulting affective states. Based on attentional models of time perception, the research presented below argues that, of these three measures, the subjective experience of the pace of passing time is the most important determinant of affective state in waiting contexts. Consistent with this explanation, a laboratory experiment demonstrates that the effect of atmospheric music on the affective states of respondents waiting for an upcoming event was mediated by their subjective experience of time as passing more quickly or slowly than usual, whereas neither perceived duration nor deviations from expected duration were related to affective state.

SUBJECTIVE EXPERIENCES OF PASSING TIME: ATTENTIONAL MODELS

Attentional models hold that attention is divided between processing temporally-relevant versus temporally irrelevant information. An increase in attention devoted to temporally relevant information results in more information recorded regarding the passage of time (Block 1990). As more and more attention is devoted to the passage of time, perceived duration increases (Zakay 2000). Attentional models are particularly relevant to waiting contexts because people who are waiting for an upcoming event pay closer attention to the passage of time than they would in other situations (Zakay 1990). Attentional models are best captured by the familiar cliché “Time flies when you’re having fun”, and also suggest that time drags when you are not having fun (i.e., waiting). However, in a waiting context, the relationship also operates in reverse; a wait that feels as if it is passing quickly is far less annoying than one which seems to drag on. In other words, attentional models suggest that the effect of waiting on affective states is mediated by the subjective experience of the rate at which time seems to pass. Any stimulus that distracts customers from thinking about the passage of time should speed up the subjective experience of passing time, making the wait seem more bearable. One of the most frequently studied stimuli in this regard is atmospheric music (Baker et al. 2002).

For example, MacNay (1996), North and Hargreaves (1999), Roper and Manela (2000), and Guegen and Jacob (2002) found that respondents reported shorter duration estimates when atmospheric music was present versus absent in a medical exercise facility, an experimental laboratory, a psychiatric care waiting room, and a telephone on-hold setting, respectively. Assuming that music diverts attention away from monitoring time, less temporal information is encoded and elapsed time seems shorter. Yalch and Spangenberg (1990) reported that shoppers under the age of 25 gave shorter estimates of shopping time when they heard Top 40 music more, hence diverting attention from the passage of time and reducing perceived duration, whereas the reverse may have been true for older shoppers (Yalch and Spangenberg 1993). Also consistent with attentional models, Lopez and Malhotra (1993) and Cameron et al. (2003) found that respondents’ time estimates were negatively correlated with their reported liking of atmospheric music. Collectively, these results suggest that people exposed to atmospheric music that they like will devote less attention to the passage of time, thus making time seem to pass quickly and the wait seem more bearable (Cameron et al. 2003). This suggests the following two hypotheses:
**H1a:** People exposed to music they like during a waiting period will report feeling that time has passed more quickly than usual compared to people exposed to disliked music.

**H1b:** The effect of music likeability on affective states will be mediated by the subjective experience of time as passing more slowly or quickly than usual.

Much of the research examining customer satisfaction has adopted a disconfirmation of expectations paradigm, wherein satisfaction judgments are driven by differences between perceptions of the actual service experience and prior expectations of the service (Parasuraman, Zeithaml and Berry 1985). Not surprisingly, previous research on customer waiting has largely relied on measures of perceived duration and/or deviations from expected duration as indicators of the negative effects of waiting on satisfaction (see Houston, Bettencourt and Wenger 1998; Pruyn and Smidts 1998).

Many of these studies have found that perceived waiting time is negatively correlated with overall satisfaction in settings as diverse as restaurants (Jones and Peppiatt 1996; Davis and Heineke 1998), supermarkets (Tom and Lucey 1997), video rental stores (Evangelist et al. 2002), banks (Houston et al. 1998), emergency healthcare (Dansky and Miles 1997), general healthcare (Pruyn and Smidts 1998), and airlines (Taylor 1994). In other words, these studies found that the longer customers think they have waited, the less satisfied they are with their service experience.

Research has also found that various aspects of atmospheric music reduce perceived duration in contexts as diverse as healthcare (MacNay 1996), psychiatric care (Roper and Manela 2000), telephone on-hold (Gueguen and Jacob 2002), university registrations (Oakes 2003), department stores (Yalch and Spangenberg 1990, 1993), supermarkets (Gulas and Schewe 1994), and among students participating in laboratory experiments (Kellaris and Altsch 1992; Kellaris and Kent 1992; Lopez and Malhotra 1992; Kellaris and Mantel 1996; Kellaris, Mantel and Altsch 1996; Hui, Dube and Chebat 1997; North and Hargreaves 1999; Yalch and Spangenberg 2000; Bueno, Firmino and Engelmann 2002; Cameron et al. 2003; Mantel and Kellaris 2003).

However, other researchers have reported little or no direct relationship between atmospheric music and perceived duration in contexts such as telephone on-hold (North, Hargreaves and McKendrick 1999), banks (Chebat, Gelinas-Chebat and Filatratel 1993), gymnasiuums (North, Hargreaves and Heath 1998), restaurants (Caldwell and Hibbert 1999), and among students participating in laboratory experiments (Boltz 1998; Brown and Boltz 2002). Moreover, many of the effects reported above are in opposition to the predictions of attentional models (Kellaris and Kent 1992; Hui et al. 1997; Gulas and Schewe 1994; Yalch and Spangenberg 2000), and some involve direct contradictions. For example, Lopez and Malhotra (1992) reported that, compared to disliked music, liked music reduced perceived duration among students participating in a laboratory study, whereas Hui et al. (1997) reported that liked music actually increased perceived duration compared to disliked music. This may reflect the finding that attentional models hold mainly when people focus on the passage of time during the target interval (Block and Zakay 1997), which would be expected of customers waiting for an upcoming event (Zakay 1990; North and Hargreaves 1999), but not necessarily in all retailing contexts (Bailey and Arent 2006).

Moreover, when attentional models do operate, as is the case in waiting contexts, the subjective experience of time passage has a more direct effect on resulting affective states than does perceived duration (Friedman 1990; Flaherty 1999). For example, given certain environmental conditions (e.g., waiting while listening to disliked atmospheric music), time may feel like it is dragging on even though a customer has a rough idea of how long he has been waiting (e.g., due to periodically checking his watch). In these kinds of situations, subjective experience and not perceived duration would capture the effect of prolonged thinking about the passage of time on resulting affective state. Hence, the following hypothesis is advanced.

**H2:** The perceived duration of the wait period will not mediate the effect of music likeability on reported affective states.

With respect to differences between perceptions and expectations, some researchers have found that waits perceived as exceeding expectations are associated with lower levels of satisfaction in hospitals (Pruyn and Smidts 1998; Boudreaux, Mandy, and Wood 2003), emergency healthcare facilities (Hedges, Trout and Magnusson 2002), airline travellers (Taylor 1994), fast food restaurants (Davis and Heineke 1998), and among students participating in laboratory studies (Kumar, Kalwani and Dada 1997; Hui, Thakor and Gill 1998; Cameron et al. 2003). However, results regarding deviations from expected duration are also equivocal. Other studies have found that negative gaps between perceived and expected wait times did not result in lower levels of satisfaction in hospitals (Boudreaux, Mandy and Wood 2003), banks (Houston et al. 1998), restaurants (Luo et al. 2004), and among students participating in laboratory studies (Hui and Tse 1996). Moreover, research has not examined the effects of atmospheric music on deviations from expected duration because expected duration judgments are, by definition, formed prior to exposure to the wait setting. This limits the effects of any atmospheric variable, and results in deviation judgments being strongly correlated with perceived duration measures. Hence, the following hypothesis is advanced.

**H3:** Deviations from the expected duration of the wait period will not mediate the effect of music likeability on reported affective states.

**METHOD**

Eighty-six undergraduate students studying business at a major Australian university were recruited for participation in the experiment. Course credit (2%) was offered as an incentive to participate. In addition, respondents who successfully completed the experiment were entered into a draw for 4 prizes of $500 each. They were told that the study involved knowledge of brand names in various product categories and that they would be required to perform a recall task followed by the completion of a questionnaire. On arrival, they were greeted by a laboratory assistant, asked to sign a consent form, and asked to wait until the study began. When all the respondents for a given session had arrived, the researcher led them in groups of 6–8 into a room set up to appear like a waiting room, with little or no visual stimuli, and no clocks. They were instructed to place all hand bags, backpacks, etc. on a table, to turn off their mobile phones, and to refrain from talking to one another so as not to bias the outcome of the study. The researcher then explained that “the sessions are being run in multiple rooms to save time and things are running a bit behind schedule”, and that he would “return shortly to begin the study when the previous session ends”. The actual time spent in the waiting area was 17.5 minutes. This prevented respondents from guessing correctly simply by rounding up (i.e., 20 minutes) or down (i.e., 15 minutes) to a “standard” time interval. The experimenters began the target period when the last respondent entered the room. He returned to the room after 17 minutes, and distributed the questionnaire containing the
dependent measures. Respondents were instructed to complete the questionnaire 17.5 minutes after the last person entered the room.

Independent Variable: Music Likeability

Several selections of music were selected from two categories, recent number one hits versus uncharted songs from the 1950s. Despite the face validity of the manipulation (i.e., university students would presumably prefer recent number one songs to music created long before they were born), a manipulation check measure prompted respondents with the open-ended statement: “To what extent did you find the music...” and asked them to circle the number corresponding to their perception of the music on five 7-point scales anchored by “unpleasant (1)–(7) pleasant”, “unappealing (1)–(7) appealing”, “unlikely (1)–(7) likable”, “boring (1)–(7) interesting”, and “unexciting (1)–(7) exciting”. The results of an exploratory factor analysis indicated a single factor solution with an eigenvalue of 3.1 and with all factor loadings exceeding 0.7. Using a mean weighted by factor scores as the dependent variable, a one-way ANOVA revealed a significant effect of music likeability (F(1,73)=27.1, p<.0001, w2=.27), wherein the recent number one songs were rated as more likable (M=4.7) than the 1950s songs (M=3.3).

Mediating Variables

Perceived Duration: Similar to the approaches used by Hui and Tse (1996) and Mantel and Kellaris (2003), the first item on the questionnaire asked respondents: “Without looking at your watch, please estimate how long you have been in this room. _______ minutes _______ seconds.” This open-ended approach is common in time perception research because it tends to eliminate any rounding off to the nearest minute (Block 1990).

Subjective Experience of Time Passage: The next two items in the questionnaire measured respondents’ subjective experience of time passage using 7-point semantic differential response scales. Both items were based on work by Friedman (1990) and Flaherty (1999). Respondents were prompted with: “During the period I’ve been in this room:” using a response scale anchored by “time has flown by” (1)–(7) “time has dragged on”, and “Since I’ve entered this room:” “time has passed quickly” (1)–(7) “time has passed slowly”. The subjective experience measure was the mean of the two items.

Deviation from Expected Duration: The next item measured deviations from prior expectations of duration. Adapted from earlier research by Houston, Bettencourt and Wenger (1998) and Boudreau, Mandy and Wood (2003), the item prompted respondents with the statement: “The amount of time I’ve been in this room has been” and used a response scale anchored by “shorter than expected” (1)–(7) “longer than expected”. Respondents were instructed to circle the number that best corresponded to their perception of the wait period.

Dependent Variable: Affective state

The affective state measure involved the five items used to measure the pleasure-displeasure dimension of Mehrabian and Russell’s (1974) PAD model of affect. This measure has been used in several studies examining retail atmospherics (Donovan and Rossiter 1982; Hui and Tse 1996), and more specifically, the impact of music likeability on time perception and affective states (Cameron et al. 2003). Respondents were prompted with the statements “This question is about how you feel now. For each scale, circle the number that corresponds with your current mood.” Five 7-point scales followed, with the anchors: “depressed (1)–(7) contented”, “unhappy (1)–(7) happy”, “unsatisfied (1)–(7) satisfied”, “annoyed (1)–(7) pleased”, and “bored (1)–(7) relaxed”.

Given the importance of distinguishing among perceived duration, deviation from expected duration, and the subjective experience of passing time, an exploratory factor analysis of the items comprising the mediating and dependent variables was conducted. As shown in Table 1, the results indicated a four factor solution. The five pleasure-displeasure items loaded on the first factor, which produced an eigenvalue of 3.62. Factor loadings ranged from .79 to .87, and communalities ranged from .65 to .79. The two subjective experience items loaded on the second factor, which produced an eigenvalue of 1.82. The factor loadings were .83 and .93 and the communalities were .87 and .91, for the first and second item, respectively. The third factor, which produced an eigenvalue of 1.05, directly corresponded to the deviation from expected duration measure, which had a loading and communality of .97 and .99, respectively; and the final factor, with an eigenvalue of 1.04, corresponded to the perceived duration measure, which produced a loading of .99 and a communality of .98. These results suggest that perceived duration, deviation from expected duration, and the subjective experience of a time interval are distinct constructs with the potential to differentially mediate the effect of music likeability on affective state. Hence, the measures for subjective experience and affective state were the mean scores of the corresponding items, weighted by factor loadings, and the measures for perceived duration and deviation from expected duration were simply the responses to the corresponding single items.

RESULTS

Hypotheses 1–3 were tested via four 1-way ANOVAs with music likeability as the independent variable and affective state, subjective experience, perceived duration and expected duration as the dependent variables; and 3 ANCOVAs with likeability as the independent variable, affective state as the dependent variable and subjective experience, perceived duration, and expected duration as the three covariates. All hypotheses essentially required that respondents exposed to the liked atmospheric music would report more favourable affective states than respondents exposed to disliked music. The results of the first ANOVA supported this expectation. The effect of music likeability on reported affective states was significant (F(1,81)=11.9, p<.001, w2=.11), with respondents reporting more positive affective states in the liked condition (M=4.3) compared to the disliked condition (M=3.7).

Hypothesis 1a predicted that respondents hearing liked music would report that the waiting interval passed more quickly than usual compared to respondents hearing disliked music, and hypothesis 1b predicted that the effect of music likeability on affective state would be mediated by the subjective pace of time passage. A second ANOVA with likeability as the independent variable and subjective experience as the dependent variable revealed a significant result (F(1,83)=11.9, p<.001, w2=.11), with respondents in the disliked condition reporting that time passed more slowly (M=5.0) than did respondents in the liked condition (M=3.9), hence supporting hypothesis 1a. As shown in Table 2, when subjective experience was included as a covariate in an ANCOVA with music likeability as the independent variable and affective state as the dependent variable, it was a significant predictor (F(1,80)=19.6, p<.0001), and the effect of music likeability on affective state was all but eliminated (F(1,80)=1.4, p=.25). Hence, the effect of music on affective state was mediated by the subjective experience of time passing more slowly or quickly than usual; hypothesis 1b was supported.

Hypothesis 2 predicted that perceived duration would not mediate the effect of music likeability on reported affective states. A third ANOVA revealed that music likeability had little or no effect on perceived duration (F(1,84)<1). Moreover, when perceived duration was included as a covariate in an ANCOVA with music
likeability as the independent variable, it was not predictive of affective state \( F_{1,80} = 1.9, p < .18 \). Hence, although failing to reject the null hypothesis cannot be construed as supporting a prediction, these results are at least consistent with hypothesis 2. Hypothesis 3 predicted that deviation from expected duration would not mediate the effect of music likeability on reported affective states. A fourth ANOVA revealed that music likeability had a significant effect on expected duration \( F_{1,83} = 4.8, p < .04, \omega^2 = .04 \). Respondents reported that the wait period was longer than expected when they heard disliked \( (M=5.6) \) compared to liked \( (M=4.8) \) music. Moreover, when expected duration was included as a covariate in an ANCOVA it was marginally significant as a predictor of affective state \( F_{1,80} = 3.6, p < .06 \); however, the effect of music likeability remained significant \( F_{1,80} = 5.1, p < .03, \omega^2 = .04 \). Hence, these results are consistent with hypothesis 3.

**DISCUSSION**

The research reported above assumed that the ultimate impact of atmospheric music is on affective state, with the subjective experience of time passage as the mediating variable. However, previous research has examined the mediating role of affective state in accounting for the effect of music on time perception (Wansink 1992; Hui, Dube and Chebat 1997). In order to examine whether this alternative view applies to the results reported above, affective state was examined as a possible mediator of the effect of atmospheric music on deviation from expected duration and the subjective experience of time passage (it has already been established that music had little or no effect on perceived duration). Two ANCOVAs were conducted with atmospheric music as the independent variable, affective state as the covariate, and deviation from expected duration and the subjective experience of time passage as the two dependent variables.

For the ANCOVA with the deviation measure as the dependent variable, the effect of affective state as a covariate was marginally significant \( F_{1,80} = 3.6, p < .06 \), and the effect of music was no longer significant \( F_{1,80} = 2.0, p < .17 \). Moreover, the size of the effect of music declined noticeably when affective state was included as a covariate (from \( \omega^2 = .04 \) to \( \omega^2 = .01 \)). Hence, consistent with Wansink (1992) and Hui et al. (1997), affective state does mediate the effect of atmospheric music on expected duration. In the ANCOVA with subjective experience as the dependent variable, the effect of affective state as a covariate was highly significant \( F_{1,80} = 19.6, p < .0001 \), and the effect of music remained significant \( F_{1,80} = 6.0, p < .02 \), though the effect size was reduced (from \( \omega^2 = .11 \) to \( \omega^2 = .04 \)). On the basis of these results one could conclude that the effect of atmo-

<p>| TABLE 1 |</p>
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<th>Factor Analysis Results for the Measures of Affective States, Subjective Experience, Perceived Duration, and Expected Duration</th>
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Variance Explained by Each Factor

| | Factor1 | Factor2 | Factor3 | Factor4 |
| --- |
| pleas1 | 3.61874 | 1.82250 | 1.04723 | 1.04167 |

<p>| TABLE 2 |</p>
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<th>Mediation Results for Subjective Experience, Perceived Duration, and Deviation from Expected Duration</th>
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spheric music on the subjective experience of time passage is partially mediated by affective state. However, given the conceptual foundation underlying hypotheses 1 and 2, and the result that subjective experience completely accounted for the effect of music on affective state, the more parsimonious conclusion is that former mediates the effect of music on the latter. Hence, conceptual models appear to be more useful than other conceptual models for explaining the effects of atmospheric music on affective states in waiting contexts.

A number of other factors have been shown to reduce perceived waiting time in addition to atmospheric music, including giving estimates of the duration of a delay (Hui and Tse 1996; Roper and Manela 2000), involving customers in the provision of the service (Chebat and Filiatrault 1993), giving people tasks to complete during a wait (Danksy and Miles 1997), providing entertainment (Jones and Pepiatt 1996), asking about customers’ well-being (Roper and Manela 2000), and avoiding interruptions (Chebat and Filiatrault 1993). The assumption underlying much of this research is that reducing perceived duration will make the wait more bearable and result in higher levels of satisfaction (Jones and Pepiatt 1996; Danksy and Miles 1997).

However, the results reported above question whether this assumption holds. For example, giving repeated updates on the estimated duration of a delay may reduce perceived duration by giving customers a basis for making more accurate estimates, but this may have little or no influence on how much attention is devoted to monitoring the passing time or whether time seems to drag on during the wait. By contrast, engaging customers in conversation will almost certainly divert attention away from monitoring time; this would result in time seeming to pass more quickly than usual, and hence, a more favourable affective state. In short, perceived duration is related to affective state and/or customer satisfaction mainly when attentional models operate.

The research reported above has a number of limitations which should be disclosed and further discussed. Given the goals of this research, the most directly relevant shortcoming is the measure of the subjective experience of passing time. Although perceived duration and expected duration are often measured using single items, the subjective experience of passing time is, on the face of it, a more complex construct, potentially having multiple dimensions. The two items reported here reflect the conceptualization of Friedman (1990) and Flaherty (1999), but a more comprehensive approach would involve the development of numerous potential items, the elimination of items that are not highly correlated with the majority of the items, assessing the dimensionality and reliability of the remaining items, and an examination of the resulting scale on a new sample (Churchill 1979). Future research should proceed along these lines, as better measures of cognitive processes will be needed if research examining the effects of waiting on affective state is to progress further.

The artificial laboratory setting is another potential limitation of this research. Much of the literature in this area involves actual customers waiting in actual retail settings. Although field studies do not necessarily provide higher levels of external validity, they are useful for establishing the relevance of the theory to an actual consumer behavior setting. Finally, the dependent variable in this research was general affective state rather than satisfaction with the waiting experience, as is often used in this area of research. It could be the case that listening to music influenced respondents’ affective states directly, quite apart from any influence on the perceived passage of time. Future research should use a more direct measure of whether respondents were satisfied with the wait experience to better test the proposed mediating processes.

REFERENCES


