The Moderating Role of Target-Arousal on the Impact of Affect on Satisfaction—An Examination in the Context of Service Experiences

JOCHEN WIRTZ
National University of Singapore

ANNA S. MATTILA
The Pennsylvania State University

RACHEL L. P. TAN
National University of Singapore

Recently, an increasing number of studies have focused on the emotional role of satisfaction in the consumption of services. In this study, a new moderating variable called “target-arousal level” was introduced to advance our understanding of the role of pleasure and arousal in the satisfaction evaluation process. The results from our experimental study indicate that the traditional pleasure-arousal interaction effect (e.g., Mehrabian and Russell, 1974) might be limited to high target arousal situations. Optimal arousal theories (e.g., Berlyne, 1960), on the other hand, might offer a fruitful framework for the satisfaction-arousal link in low target arousal environments.

Competition between retail outlets has led managers to pay attention to esthetics and atmospherics. Nike, for example, has moved ahead of its competitors by introducing its high-tech flagship stores that are creating exciting experiential spaces with high pleasure and arousal qualities rather than being mere selling outlets (Schmitt and Simonson, 1997). Recent research has shown that pleasure and arousal mediate consumers’ desire to stay in or escape from a setting, their desire to affiliate with others in the setting, and their willingness to spend money or time (e.g., Donovan and Rossiter, 1982, Dubé, Chebat, and...
Morin, 1995, Wakefield and Baker, 1998, Sherman et al., 1997). However, within the service satisfaction context, previous research has failed to support the traditional interaction effect between arousal and pleasure (e.g., Wirtz and Bateson, 1999).

In this research we argue that consumers possess desired levels of arousal associated with service environments. We derive from this argument the need for a new moderating variable, target-arousal level, to understand the interplay between arousal and pleasure in a service satisfaction context. For instance, consumers might seek relaxing (low arousal) settings for a fine-dining experience, whereas amusement parks are expected to be exciting (high arousal). Because consumers may seek different levels of arousal depending on their consumption goals, creating servicescapes that match the desired or targeted arousal levels should enhance customer satisfaction. In the subsequent section, we discuss the relevant work in the satisfaction and affect literature. Thereafter, the concept of target-arousal is introduced.

CONSUMER SATISFACTION

Oliver (1997, p. 13) proposed that “satisfaction is the consumer’s fulfillment response. It is a judgment that the product or service feature, or the product or service itself, provided (or is providing) a pleasurable level of consumption-related fulfillment, including levels of under- or overfulfillment.” This definition of satisfaction suggests that the evaluation process spans the entire consumption experience. This characteristic is important in the study of consumer satisfaction with services, given the experiential, interactive nature of service encounters (Bateson and Hoffman, 1999; Bitner, 1990).

The voluminous past research in consumer satisfaction has proposed various theoretical structures to examine the antecedents of satisfaction. Of these, the confirmation/disconfirmation paradigm based on some preconsumption comparison standard (e.g., expectations) had emerged as the most widely accepted paradigm (Wirtz and Mattila, 2000; Yi, 1990). Recently however, there has been an increasing recognition among satisfaction researchers that a purely cognitive approach may be inadequate in modeling satisfaction evaluations. It is now generally accepted that consumers’ evaluative judgments are based partly on cognition and partly on affective responses to a product stimulus (Oliver, 1997). The disconfirmation model might perform poorly in explaining satisfaction with services, because service encounters are not easily reduced to concrete, multiattribute evaluations (e.g., Jayanti, 1998). The inclusion of affect into the conceptualization of consumer satisfaction is particularly important with services due to their experiential nature.

A service involves a process or a performance in which consumers are involved in the service production process. Because consumers interact with the service setting and personnel during the consumption experience, understanding consumers’ affective responses becomes critical in modeling satisfaction in a service setting. Prior research in services has shown that affective processes during the consumption stage might play a direct, unmediated role in determining satisfaction (e.g., Liljander and Strandvik, 1997; Wirtz and Bateson, 1999).
Affect in Consumption Experiences

According to Oliver (1997), affect represents the feeling side of consciousness, as opposed to thinking, which taps the cognitive domain. In the field of environmental psychology, affect has been conceptualized in several ways: Plutchik’s psycho-evolutionary research, Izard’s discrete emotions, and Russell’s model of affect, to list a few of the more established frameworks.

Russell’s circumplex model of affect represents the leading model conceptualizing affect in the services literature (e.g., Bitner, 1992; Donovan and Rossiter, 1982; Donovan et al. 1994; Dubé, Chebat, and Morin, 1995; Hui, Dubé, and Chebat, 1997; Wirtz and Bateson, 1999). Russell suggested pleasantness/unpleasantness and arousal/quietude as affect’s two primary orthogonal dimensions. The bipolar conceptualization of affect can be defined by eight variables falling meaningfully in a circular pattern: pleasant 0°, exciting 45°, arousing 90°, distressing 135°, unpleasant 180°, gloomy 225°, sleepy 270°, and relaxing 315°. Russell and Pratt (1980) suggested that the circumplex model be aimed at capturing human-environment and interpersonal interactions, thus making this conceptualization of affect particularly useful in studying services. Moreover, Oliver (1997) points out that this configuration is conceptually richer than discrete emotion models, because low arousal affect is explicitly included in the taxonomy.

Russell’s framework was originally developed to study the influence of affective responses on person-environment interactions (Amato and McInnes, 1983; Mehrabian and Russell, 1974). Because services consist of such human-environment interactions, several researchers have employed Mehrabian and Russell’s (1974) response taxonomy. Affect has been shown to have substantial impact on the consumer’s emotional evaluation of the service environment, and on “approach-avoidance” behaviors (Donovan and Rossiter, 1982; Donovan et al., 1994; Dubé, Chebat, and Morin, 1995; Hui, Dubé, and Chebat, 1997). Specifically, pleasure has been shown to drive approach and avoidance directly, and arousal acts as an amplifier of the pleasure-behavior relationship (e.g., Mehrabian and Russell, 1974; Donovan and Rossiter, 1982).

Furthermore, the pleasure-arousal interaction has been previously tested with affiliation behaviors. Amato and McInnes (1983) reported significant pleasure-arousal interactions on affiliation measures of city environments, corresponding to Mehrabian and Russell’s (1974) research findings. Dubé, Chebat and Morin (1995) proposed a higher desire to affiliate when consumers experience pleasure. In their study, the interaction effects between pleasure and arousal on affiliation were significant in pleasure situations. In low pleasure situations, arousal merely amplified the respondent’s reported desire to affiliate, but not actual affiliation behavior.

Wirtz and Bateson (1999) applied Russell’s framework in the context of service satisfaction. In contrast to prior studies that had employed the “approach-avoidance” taxonomy, their results failed to exhibit significant arousal-pleasure interaction effects on consumer satisfaction. In the next section, we introduce the concept of target-arousal as a possible explanation for the incongruent findings between the environmental psychology and satisfaction literature.
Target-Arousal Level

A growing body of literature points to the usefulness of the categorization approach in explaining how consumers evaluate products and services (e.g., Sujan, 1985; Stayman et al., 1992). Categorization is a simplifying strategy that helps consumers reduce the level of complexity in the service environment. Prior research suggests that consumers might use their affective expectations, in addition to cognitive schemata, to categorize consumption experiences (Dabholkar, 1992; Dubé, 1990; Jayanti, 1998). The results of Jayanti’s (1998) study in a health care setting suggest that consumers might be particularly sensitive to service providers, who fail to meet their affective expectations.

In this investigation, we propose that consumers’ affective expectations are situation-specific. The underlying assumption in Bitner’s (1992) model of servicescape is that each customer comes to a service organization with a goal or purpose that might be either aided or hindered by the physical surroundings. Consequently, these situation specific goals might be highly influential in shaping consumers’ affective expectations of the consumption experience. Ang, Leong, and Lim (1997) suggested that consumers of different services are likely to seek different levels of arousal (overt or passive) in their service consumption. For example, in a fine dining context, consumers typically seek low arousal and high pleasure, whereas amusement parks are perceived as thrill seeking. Consumers might, therefore, differ in the “target-arousal states” they hold in the preconsumption stage. Many service providers, recognizing the influence of affect in consumer behavior and evaluations, tend to purposefully orchestrate certain affective states in their customers through the design of the service environment and service personnel interactions (Carbone and Haeckel, 1994). Formal hypotheses on the moderating role of target-arousal states are developed in the next section.

The concept of target-arousal is consistent with earlier work in psychology, which holds that the impact of arousal on response behavior can be situation, time and place-specific (Berlyne, 1960, 1967). Furthermore, optimal stimulation theories suggest that the amount of arousal a person prefers in an environment depends upon his or her arousal-seeking disposition (e.g., Mehrabian and Russell, 1974; Zuckerman, 1979; Zuckerman, Schultz, and Hopkins, 1967). Some people characteristically prefer calm settings (low arousal), whereas others actively seek to increase their arousal (Mehrabian and Russell, 1974). Together, these theories suggest that there should be an optimal level of stimulation an individual prefers (i.e., target-arousal) in a given situation, and that this level is determined by the nature of the setting as well as the characteristics of the persons in that setting.

RESEARCH HYPOTHESIS

We propose that, in the context of services, the consumer’s “target-arousal level” plays an important role in the pleasure-arousal interaction on satisfaction. In other words, the amplifying role of arousal on effects of pleasure on satisfaction may be contingent on the targeted arousal level of the consumer. Hence, pleasure is posited to affect satisfaction
directly, and arousal has been proposed to account for the intensity, and not the direction or quality, of satisfaction responses (i.e., it acts as an amplifier of the effects of pleasure on satisfaction). However, the ‘target-arousal level’ of the consumer is posited to moderate this pleasure-arousal relationship. As suggested earlier, consumers, aside from developing performance-related expectations, may form prior beliefs regarding their feelings in a service setting. Thus, the consumer’s prior expectations serve as cognitive as well as affective anchors for the impending consumption experience (Dabholkar, 1992; Dubé, 1990; Muller et al., 1991). Because an individual’s response to an environment is dependent on situational factors (e.g., Bitner, 1992; Ward et al., 1988), consumers are likely to seek out different types of environments based on their consumption-related goals. In other words, the consumers’ targeted arousal levels become incorporated into their affective expectations.

This study focuses on the pleasure, rather than displeasure dimension of affective expectations. It is believed that human beings are intrinsically pleasure seeking (Holbrook and Hirschman, 1982), and consumers typically desire to feel pleasure (rather than displeasure) out of a service experience (Carbone and Haeckel, 1994). Therefore, consumers’ target affective states before a consumption experience are likely to fall on the pleasure side of the affect continuum.

In this study, the impact of target affective states on consumer satisfaction is explored within Russell’s framework. Consumers may want to feel excited (i.e., highly aroused and pleased) when going to a nightclub or disco, just pleasant (moderately aroused and pleased) when dining in restaurant, and relaxed (not aroused, but pleased) when visiting a spa. The target-arousal levels are hypothesized to interact with the amount of satisfaction derived from the consumption experience. To illustrate, a consumer who wants to feel relaxed and unaroused will probably not exhibit enhanced satisfaction, should a service environment be arousing and exciting. However, when the consumer desires a high target-arousal level, the pleasure-arousal interaction, as suggested in past research, is believed to be significant (cf. Donovan and Rossiter, 1982; Mehrabian, 1980). In other words, we propose that when the consumer desires to feel excited, arousal should magnify the effects of pleasure on satisfaction evaluations.

We believe that Wirtz and Bateson’s (1999) inability to find an interaction effect may have been a result of the research design. The service arena employed in their study, banking services, may be regarded as low arousal environments. This affective expectation might have been reflected in the subjects’ target-arousal levels. We propose that the introduction of the target-arousal level as a moderating variable may resolve this problem. This perspective is summarized in the following hypothesis:

\[ H_1: \text{Given a high target-arousal level, increasing arousal enhances the impact of pleasure on satisfaction.} \]

In this study, we propose that when a consumer desires to be in a relaxing or low arousal environment, then increasing arousal levels reduce the effects of pleasure on satisfaction. This is because the high arousal elicited by the service environment is not congruent with the low target arousal level desired by the consumer in a relaxing setting. This view is consistent with optimum stimulation theories, which suggest that such goal-directed
affective expectation may override the magnifying effects of arousal as predicted by the 
Mehrabian–Russell model (Russell and Mehrabian, 1976). Consequently, we make the 
following prediction:

\[ H_2: \text{Given a low target-arousal level, increasing arousal reduces the} \]
\[ \text{impact of pleasure on satisfaction.} \]

**METHODOLOGY**

**Research Design and Setting**

A $2 \times 2 \times 2$ (target-arousal level $\times$ arousal $\times$ pleasure) factorial design was employed to test the hypotheses. Target-arousal levels during the preconsumption, and the arousal and pleasure levels during the service encounter were each manipulated at high and low levels.

The research was conducted using a video role-play scenario, simulating a service encounter in a restaurant. Video simulations tend to be high in ecological validity (Bateson and Hui, 1992; Carpman, Grant, and Simmons, 1985, McKechnie, 1977). In fact, “everything that is seen and heard, and goes on is (supposed to be) exactly the same as in the real setting” (Hui, Dubé, and Chebat, 1997).

To be able to test the hypothesized interaction effects, it was necessary to select a study context that was able to elicit all the four affective states in Russell’s circumplex model of affect; (1) exciting—arousing and pleasant; (2) relaxing—unarousing and pleasant; (3) irritating—arousing and unpleasant; and (4) boring—unarousing and unpleasant. Prior research suggests that restaurant experiences match this criterion (e.g., Havlena and Holbrook, 1986). Moreover, the use of restaurants provided a context in which target affective states could be manipulated realistically, that is, when consumers decide to visit a restaurant, they may desire to feel either excited or relaxed.

To create a realistic portrayal of the restaurant service encounter, a video clip was designed to meet several requirements. First, the scenario needed to closely simulate reality, and to be easily understood by the study subjects. Second, the respondents needed to be able to project themselves in the simulated environment and to be able to respond as if the simulated environment was real. With these prerequisites of the video simulation in mind, a convenience sample of 30 undergraduate business majors were surveyed on the scripts that they go through in using a restaurant service. The scripted behaviors were analyzed for their frequencies and the events with the highest occurrences were used as input to the construction of a four-minute video clip portraying a typical dining experience from a consumer’s perspective. The video was recorded in a new restaurant in a shopping mall serving mainly pizzas and desserts. The restaurant name was neither mentioned in the questionnaire nor shown in the video to avoid any potential biases that the subjects might have towards any one individual provider, and to be able to manipulate arousal and pleasure performances credibly.
Target-arousal was manipulated in a brief written scenario at the beginning of the questionnaire. The high target-arousal manipulation narrated a scenario where Joey, a hypothetical customer, was going to a social dinner, to have a lively and exciting time with friends. The low arousal level version described a scenario where Joey was going for a good dinner after a long stressful day at school, and hoped to relax and unwind from the stress of a tiring day.

The four affective states (exciting, irritating, relaxing, and boring) were manipulated in the experiment by editing the levels of light, music tempo and volume, and sounds within the same video, which was used across all experimental conditions. For example, the ‘exciting’ scenario featured fast tempo, moderately loud music, bright lighting and moderate sounds of people talking. The ‘irritating’ scenario was manipulated using fast tempo, loud music, noisy sounds of people talking and jarring sounds from a faulty audio system. To manipulate the ‘relaxing’ affective state, we designed a video that featured soft, slow tempo music, soft, dim lighting, and murmurs of people talking. Finally, the ‘boring’ affective state was elicited with no music, dull, florescent lighting, and murmurs of people talking.

To sensitize the subjects to the environment shown in the videos, we provided a brief written description of the restaurant atmosphere to be administered before viewing the videos. For example, the ‘relaxing’ scenario read: “Joey notices that the restaurant is lit with soft, dim lights, and hears soothing, slow music playing in the background. There are murmurs of people chatting in the restaurant,” whereas the narrative accompanying the ‘exciting’ scenario read: “Joey notices that the restaurant was lit with bright lights and colors, and hears upbeat music playing in the background. There are moderate sounds of people talking in the restaurant”.

Pretest Results

To ensure that the video settings were perceived as intended, the pleasure and arousal manipulations were pretested with 51 subjects. As expected, the manipulations regarding high-low pleasure and high-low arousal were perceived to be significantly different across the two levels ($t = -3.1, p < .001$, and $t = -6.9, p < .001$, respectively). Similarly, target-arousal was manipulated at two levels (high and low) and independent $t$ tests indicated that the pretest subjects perceived the manipulated arousal levels as intended ($t = 11.0, p < .001$). The pretest also demonstrated that the respondents were able to understand the scenarios and the questions asked in the study.

Procedures of Main Study

Eight experimental sessions were conducted with 240 undergraduate students enrolled in a major business school in Singapore. Eating out is a popular past-time for young Singaporeans (Chan, 1994) and university students are experienced consumers of restaurant services. Each session began with an oral orientation that familiarized subjects with
the role-play instructions. The subjects were asked to imagine themselves as Joey, a customer in a new restaurant. Joey is a common name in Singapore and it was chosen to be gender-neutral to facilitate projective role-playing for both male and female subjects. The subjects were then given a written scenario that included the manipulation of the target-arousal level. Next, the subjects viewed a four-minute video clip simulating the restaurant dining experience. The pleasure and arousal levels were manipulated in the video clip. After viewing the video, respondents were asked to complete the questionnaire. The average time for each experimental session was 15 min.

Measurement Scales

A self-administered questionnaire was employed for all measures in this study. The constructs of interest included three manipulation checks for the target-arousal, arousal, and pleasure manipulations, and the dependent variable satisfaction. Mehrabian and Russell’s (1974) 12-item seven-point semantic differential scale of emotional situations and environments was employed to measure target-arousal, and actual levels of arousal and pleasure. The scale consists of six items each for arousal and pleasure. The same scale was employed for the measurement of target and actual arousal (the order of items was randomized separately for each scale), but the preceding questions were worded differently. For target-arousal, subjects were instructed to “think about the feelings, moods and emotions that Joey hopes to feel while being in the restaurant.” Then, after viewing the video, subjects were asked, for the measure of actual arousal, to “think about the feelings, moods and emotions that Joey might have experienced while using the service. Take about 10 s to get into the mood of the situation. Then rate the feelings with the adjective pairs below.”

Satisfaction was measured using Westbrook and Oliver’s (1981) three-item verbal scale. It consists of an 11-point rating scale ranging from 0% to 100% (Oliver and Bearden, 1983; Oliver and Westbrook, 1982); an 11-point behavioral tendency rating scale ranging from “Certainly, Joey will do it again” to “No chance, Joey won’t do it again” (Oliver and Bearden, 1983); and a Delighted-Terrible seven-point rating scale (Andrews and Withey, 1976, Hausknecht and Webb, 1991). This scale has been shown to be amenable to the measurement of service satisfaction (Wirtz and Bateson, 1999), and consists of only three items. This makes it attractive from an administrative, efficiency point-of-view (Westbrook and Oliver, 1981). Furthermore, the scale captures cognitive, affective and behavioral satisfaction content, that is, the percentage rating scale is a mostly cognitive measure, the behavioral tendency rating scale captures a behavioral dimension, and the Delighted-Terrible scale measures the more affective content of satisfaction (Hausknecht, 1990, Oliver, 1997). It should be noted here that satisfaction (and its measurement) is conceptually distinct from the affective state experienced during a service encounter. Satisfaction is about consumer evaluation of a consumption experience after a service encounter, whereas affect in this study is conceptualized as how the consumer felt during this service experience.
DATA ANALYSIS

Quality of Measures and Manipulations

A confirmatory factor analysis was performed to test the factor structure of the measures employed. The fit of the CFA model is acceptable with a $\chi^2$ of 130.14 (d. f. 74, $p < 0.01$), a GFI of 0.928 and an adjusted GFI of 0.898. There were no standardized residuals over 3.0, and only three out of 91 standardized residuals were over 2.0. All indicator factor loadings were significant and the root mean square error approximation (RMSEA) was 0.05. Taken together, the results from the CFA suggest that the measures of target-arousal, pleasure and arousal, and satisfaction had adequate discriminant validity (Sujan, Weitz, and Kumar, 1994).

To further test the discriminant validity between pleasure and satisfaction, we used the procedures suggested by Fornell and Larcker (1981), in which the average variance extracted for each construct should be higher than the squared correlation between that construct and any other construct. The average variances extracted ranged from 0.99 for satisfaction to 0.82 for arousal, whereas the largest squared correlation (between satisfaction and pleasure) was 0.77. Hence, our measures exhibited discriminant validity. Furthermore, all Cronbach alpha values were all above the 0.80 level, suggesting good reliability (Nunally, 1981). Specifically, the values were 0.87 for target arousal, 0.86 for arousal, 0.92 for pleasure, and 0.94 for satisfaction.

To provide evidence for nomological validity, the relationship between pleasure and satisfaction was assessed. Pleasure was found to have a high correlation with satisfaction ($r = .82, p < .001$; Table 1), whereas arousal was not correlated with satisfaction ($r = .03$, n.s.). These findings are congruent with past research on affect and satisfaction (e.g., Mano and Oliver, 1993; Wirtz and Bateson, 1999), and environmental psychology (Mehrabian and Russell, 1974), suggesting nomological validity.

The target-arousal level manipulations were perceived as intended. One-way ANOVA results indicated that the means between the high and low target-arousal groups were significantly different ($t = -22.8, p < .001$), and in the intended direction.

### Table 1

<table>
<thead>
<tr>
<th>Pearson Correlation Coefficients for all Items</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pleasure Manipulation</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Arousal Manipulation</td>
<td>-.02</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Target-Arousal Manipulation</td>
<td>-.03</td>
<td>-.03</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Pleasure</td>
<td>.54**</td>
<td>-.03</td>
<td>.12</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Arousal</td>
<td>-.13*</td>
<td>.61**</td>
<td>.01</td>
<td>.12</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Target Arousal</td>
<td>.02</td>
<td>-.00</td>
<td>.83**</td>
<td>.15*</td>
<td>-.02</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>7. Satisfaction</td>
<td>.58**</td>
<td>-.06</td>
<td>.01</td>
<td>.82**</td>
<td>.03</td>
<td>.03</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Notes  *$p < .05$; **$p < .01$
It was crucial in this experiment that the four affective states were elicited as intended. The results of two-way ANOVAs on the pleasure and arousal manipulation checks revealed significant differences between group means for both high-low pleasure \((F = 31.9, p < .001)\), and for high-low arousal \((F = 51.6, p < .001)\) as well. No other main or interaction effect reached significance. This gave an initial indication that the pleasure and arousal levels were perceived as intended.

More direct testing in the form of posthoc Scheffé’s tests were performed to establish whether the pleasure and arousal levels in the four affective states were successfully manipulated. Results show that the mean pleasure levels for the high pleasure conditions (‘Exciting’ and ‘Relaxing’ with means of 0.35 and 0.48, respectively) differed significantly from the means in the low pleasure conditions (‘Irritating’ and ‘Boring’ conditions with means of \(-0.92\) and \(-0.97\), respectively). For arousal, the mean arousal levels for the high arousal conditions (‘Exciting’ and ‘Irritating’ with means of 0.48 and 1.00, respectively) differed significantly from the means in the low arousal conditions (‘Relaxing’ and ‘Boring’ with means of \(-0.63\) and \(-0.60\), respectively). These results further indicated that all the high-low pleasure and high-low arousal manipulations were perceived as intended. Taken together, these results suggest that all manipulations were successful.

**Hypothesis Testing**

Mean satisfaction scores by experimental condition are reported in Table 2. The hypothesized interaction effects were tested using ANOVA (See Table 3). The results show a significant three-way interaction between target-arousal, arousal and pleasure on satisfaction \((F = 10.9, p < .001)\). As expected, the arousal-pleasure two-way interaction did not reach significance, and no other interaction effects reached significance, at the 0.05 level. The main effect of pleasure was significant \((F = 129.9, p < .001)\), and the main effects of target-arousal and arousal were both insignificant \((p > .05)\), as expected.

Figures 1 and 2 depict the differential relationships between arousal, pleasure, and satisfaction, under high and low target-arousal levels, respectively.

For high target-arousal, Figure 1 shows that under pleasant situations, satisfaction was

**Table 2**

<table>
<thead>
<tr>
<th>Mean Satisfaction Scores by Experimental Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Satisfaction Scores</td>
</tr>
<tr>
<td>High Pleasure</td>
</tr>
<tr>
<td>High Target Arousal</td>
</tr>
<tr>
<td>High Arousal</td>
</tr>
<tr>
<td>Low Arousal</td>
</tr>
<tr>
<td>Low Target Arousal</td>
</tr>
<tr>
<td>High Arousal</td>
</tr>
<tr>
<td>Low Arousal</td>
</tr>
</tbody>
</table>
enhanced when arousal was increased. However, under unpleasant situations, higher arousal further reduced satisfaction. These findings support H1. To test H1 directly, an ANOVA was performed on the high target-arousal subsample (N = 121). The results show a two-way interaction between arousal and pleasure (F = 5.2, p < .05), supporting H1.

When consumers desired low target-arousal, we predicted that the magnifying effect of
arousal would no longer hold true. Instead, increasing arousal was hypothesized to reduce the effects of pleasure on satisfaction. Figure 2 shows this effect, supporting H2. In the low target-arousal situation, higher arousal decreased satisfaction for the pleasant conditions. The satisfaction level for high arousal conditions (mean = -0.10) was significantly lower than that for low arousal conditions (mean = 0.64, \( p < .05 \)). In the unpleasant conditions, consumers were about equally dissatisfied, whether arousal levels were high or low (means = -0.93 and -1.06, respectively, n.s. at 0.05 alpha level). Again, to test H2 directly, a two-way ANOVA was conducted on the low target-arousal subsample. As expected, a significant interaction effect between arousal and pleasure was found (\( F = 5.71, p < .05 \)) supporting H2.

Other Findings

In addition to the hypothesized relationships, some other interesting findings surfaced during the data analysis. A new variable, termed ‘target-arousal match’, computed as the difference between targeted arousal and actual arousal level, was found to elicit higher satisfaction levels than mismatch conditions. ‘Target-arousal match’ was recorded into four levels, that is, (1) high target-arousal match (targeted and manipulated arousal were
high), (2) low target-arousal match (targeted and manipulated arousal were low), (3) higher arousal than targeted, and (4) lower arousal than targeted. The two match conditions did not display any significant differences in satisfaction ratings ($p > .05$), and were subsequently combined for further analysis. Results of ANOVA testing showed a significant interaction effect of pleasure with target-arousal match ($F = 5.9, p < .05$), while only pleasure had a significant main effect on satisfaction ($F = 98.2, p < .001$). The main effect of target-arousal match was insignificant ($F = 1.97, p = .14$).

Figure 3 depicts the congruity effect. As shown, the target-arousal match condition resulted in the highest satisfaction ratings in the pleasant situations. Both mismatch conditions consistently showed lower ratings. Although intuitively appealing and logical, this finding contradicts much of the environmental psychology literature, which suggests that arousal and pleasure interact, and that high arousal improves response behaviors in pleasant situations. However, optimum stimulation theories suggest that in pleasant situations and at the optimum stimulation level (i.e., target-arousal match) the strongest approach tendency is generated (Russell and Mehrabian, 1976). This lends theoretical support to our findings on target-arousal match, where the highest level of satisfaction was found when the targeted arousal levels were matched by actual arousal.

To summarize the results of this study, the pleasure-arousal interaction on satisfaction was significant for subjects with high target-arousal (i.e., the effects of pleasure on satisfaction were amplified by arousal). Consequently, for these subjects, increased

![Figure 3](image-url)

**Figure 3**

Target-Arousal Match and Pleasure on Satisfaction ($N = 240$).
arousal enhanced the effects of pleasure on satisfaction, and displeasure on dissatisfaction. Conversely, increasing arousal reduced the effects of pleasure on satisfaction for low target-arousal subjects. This finding suggests that consumers are sensitive to the targeted arousal levels they desire, and that satisfaction levels decrease when the actual arousal level departs from this targeted level.

DISCUSSION

This study further advances our understanding of affect in the study of service satisfaction by introducing target-arousal as a new moderating variable in the evaluation process. Extending prior work on affective expectations (e.g., Dabholkar, 1992; Dubé, 1990; Jayanti, 1998), we suggest that consumers’ desired levels of arousal influence their satisfaction evaluations. These desired or targeted levels of arousal might be dependent on the consumer’s purpose for being in a particular environment, hence reflecting goal-directed behaviors. The notion of goal-directed behaviors determining satisfaction in a service setting is advanced in Bitner’s (1992) model of Servescapes and its impact on customer and employee behaviors. Consequently, the optimal level of arousal in a particular setting may be driven by preconsumption plans and purposes.

The results of this study supported the traditional pleasure-arousal interaction (e.g., Mehrabian and Russell, 1974) on satisfaction under high target-arousal, that is, in pleasant (unpleasant) conditions the higher the arousal level, the more positive (negative) the satisfaction evaluation. However, in the low target-arousal condition, subjects failed to exhibit higher levels of satisfaction in pleasant yet high arousal environments. Instead, subjects who wanted to feel relaxed became less satisfied when experiencing increasing levels of arousal. These results are consistent with theories on optimum stimulation (Zuckerman, 1979) and on optimum arousal levels (Berlyne, 1960, 1967). According to these theories, the optimal level of stimulation (arousal) varies across individuals and across time. Hence, we argue that the target-arousal level (whether consumers want to relax, or to feel excited, or just be moderately aroused) determines the nature of the pleasure-arousal interaction effect in a satisfaction context.

The pleasure-arousal interaction effect for high target arousal environments is consistent with prior work on affiliation behaviors (Amato and McInnes, 1983; Dubé et al., 1995; Hui, Dubé, and Chebat, 1997), but is novel to the consumer satisfaction literature. To our knowledge, only one prior empirical study has employed the Russell model to examine the pleasure-arousal interaction in a postpurchase evaluation context (Wirtz and Bateson, 1999). In their study, the interaction between pleasure and arousal failed to influence satisfaction evaluations. The current study shows that consumers must possess a desire for arousal (i.e., excitement) before the actual consumption experience for the interaction effect to occur. Since the experimental design of Wirtz and Bateson’s (1999) study was set in a context for which high target-arousal states are unlikely (a banking transaction), no interaction effects could be observed.

To summarize, the results of this investigation suggest that, in a satisfaction context, the magnifying impact of arousal on pleasure is limited to high target arousal environments.
When consumers’ preconsumption goals call for low target arousal levels, the optimal arousal theories might overrule the traditional pleasure-arousal interaction hypothesis, at least in pleasant settings.

Managerial Implications

Past studies have posited that pleasure is an important driver of satisfaction, and thus managerial implications have emphasized the need to create pleasant service environments. The findings of this study, however, indicate that in addition to pleasure, consumers might have desired levels of arousal associated with service environments. Creating servicescapes that match the consumer’s desired or targeted arousal levels are here suggested to enhance customer satisfaction. The results of the present investigation suggest that either falling short or exceeding the expected levels of arousal result in lower satisfaction ratings. For example, in a banking service or a fine dining restaurant, consumers are not likely to seek arousing environments. Consequently, in services characterized by low target-arousal levels, marketers should attempt to increase customer satisfaction by making the service environment more pleasurable and less arousing.

Some ways to manage the arousal level in servicescapes include colors and lighting (e.g., Bellizzi, Crowley, and Hasty, 1983), background music (e.g., Bruner, 1990, Dubé, Chebat, and Morin, 1995, Kellaris and Rice, 1993, Milliman, 1982, 1986) and scents (e.g., Gulas and Bloch, 1995). For example, longer-wave length colors such as blues and greens have a calming or relaxing effect on most people (Shaie and Heiss, 1964), whereas the so-called warm colors (red, orange and yellow) tend to increase people’s arousal levels (Shaie and Heiss, 1964).

Similarly, increasing the sound volume and/or tempo of background music can be used to enhance the arousing qualities of a service environment (e.g., Holbrook and Gardner, 1993, Kellaris and Rice, 1993). Dive, the hip sandwich chain developed by Steven Spielberg, uses extreme lighting techniques to create high arousal environments that punctuate the dining experience (Robson, 1999). Finally, scenting the service environment can be used to manage customers’ arousal levels (e.g., Gulas and Bloch, 1995, Spangenberg et al., 1996). Rainforest Café, for instance, uses floral scents to stimulate diners in the waiting area, and the aroma therapy literature offers a wide selection of simulating and relaxing scents. For example, lavender is known to be a relaxing scent with calming properties, and grapefruit is a stimulating scent, which can refresh, revive and improve mental alertness (Butcher, 1998).

Apart from managing the arousal quality of the servicescape, service firms can also manage the target-arousal level of the consumers in the same way expectations are managed. Consequently, marketing communications may be used to manage both the target-arousal levels of the consumers and their expectations. For example, a restaurant might advertise itself as a “funky” place, or as a “fine dining” place for a meal. Providing cues on the type of service environment in an ad would condition the customer to form appropriate preconsumption expectations for the atmosphere of the restaurant. In other words, external communication efforts focusing on the servicescape could be helpful in
attracting customers whose target-arousal levels would be congruent with the arousing qualities offered by the actual consumption experience.

Our findings also suggest that service providers should lower customers’ arousal levels in intrinsically unpleasant service environments. Examples may include heavy pre-Christmas weekend shopping environments, visits to dentist, customers in long queues waiting to be served, and the like. Lowering arousal levels in such situations helps to reduce avoidance responses and dissatisfaction.

DIRECTIONS FOR FUTURE RESEARCH

The scope of this study was limited to exploring the influence of affect in the postpurchase evaluation process. However, cognitive influences such as disconfirmation-of-expectations are also critical in fully understanding consumers’ satisfaction formation processes. Consequently, future research should incorporate both affective and cognitive components in modeling consumer satisfaction. We believe that the amplifying effects of arousal observed in this study should extend to consumers’ disconfirmation judgments. Affective processes can serve as antecedents to information processing (cf. Zajonc, 1980), thus suggesting that an emotion-cognition-emotion sequencing, where emotion precedes cognition (Oliver, 1997) might provide a fruitful framework for future research.

Secondly, because the study was conducted within a single-service context, validation of the findings in other contexts will require future research. Investigating more service settings would give a richer understanding of the relative contribution of disconfirmation and affect across different types of services, and achieve greater generalizability for the findings obtained. A final caveat is the use of a student sample in this research study. Although the research context of the restaurant setting was applicable and relevant to the homogeneous undergraduate sample, it is suggested that future research may use non-student samples.

The authors gratefully acknowledge the insightful comments provided by the three anonymous reviewers and the editor. The authors also thank Patricia Chew for her research assistance towards the end of this study. This project was partially funded by a research grant from the National University of Singapore.

REFERENCES


