An experiment found that viewer involvement with a television program has a positive effect on ad memory and attitude toward the ad ($A_{ad}$) as program involvement increases from low to moderate levels. However, further increases in program involvement beyond moderate to high levels lead to decreases in ad memory and $A_{ad}$. This inverted-U relationship between program involvement and ad memory and $A_{ad}$ is explained by theories of arousal and has several implications for the slotting and design of commercials.

Advertising effectiveness is determined largely by who is reached and by how the message contents are processed. Yet, decisions concerning ad placements are driven primarily by the former, by audience size and composition. Ad placements, however, result not only in the selection of an audience but also in the selection of an advertising context. This context, in turn, affects how a message is processed. Indeed, understanding the impact of context on advertising effectiveness has been rated a top research priority among advertising practitioners (see Chook, 1985) and has stimulated a growing body of research. In particular, a number of studies have demonstrated a significant effect of involvement with the advertising context on both memory for and attitudes toward advertisements (e.g., Anand and Sternthal, 1992; Bryant and Comisky, 1978; Kennedy, 1971; Krugman, 1983; Mattes and Can-

tor, 1982; Pavelchak, Antil, and Munch, 1988; Pham, 1992; Siebert, 1978; Soldow and Prinipe, 1981). This paper extends this stream of research and attempts to reconcile seemingly contradictory findings of previous studies.

Research Focus

Consider the over 2 billion television viewers of the 1994 World Cup final—the largest global TV audience in history (Reid, 1994). Ardent soccer fans were glued to their television screens and on the edge of their seats, brimming with excitement; their involvement with the game was very high. While generally enjoying soccer, other viewers did not become quite as excited by the game; their involvement with the game was moderate. Finally, many viewers watched the game out of curiosity or boredom, or simply because their friends and family watched it. These viewers were not excited by a brilliant pass or a goal-scoring opportunity; their involvement with the game was relatively low.
The above scenario is typical for many television programs and sporting events in particular: groups of viewers are differentially involved with the program and experience different levels of arousal or excitement (Pavelchak, Antil, and Munch, 1988; Pham, 1992). Moreover, one difference between television programs, such as action-packed dramas, documentaries, or comedies is that they differentially are involving or arousing (Bryant and Comisky, 1978; Kennedy, 1971; Krugman, 1983; Mattes and Cantor, 1982; Siebert, 1978; Soldow and Principe, 1981). These differences in involvement raise a number of important questions. Do viewers at different levels of program involvement have the same ability to process commercials in depth? Will their memory for the brands advertised be the same? And how is their attitude toward the ad (A_{ad}) affected? Moreover, we examine the slotting of advertisements in television programs and explore if it is better to advertise during the more exciting portions of a program (e.g., during the game) or when the excitement is lower (e.g., at halftime or following the game).

Previous research on program involvement is divided on whether involvement facilitates or hinders the ability to process commercials shown. Specifically, prior research has supported both a positive effect of program involvement on ad recall (Siebert, 1978; Singh and Churchill, 1987) and A_{ad} (Kennedy, 1971), as well as a negative effect on ad recall (Bryant and Comisky, 1978; Pavelchak, Antil, and Munch, 1988; Soldow and Principe, 1981) and A_{ad} (Murry, Lastovicka, and Singh, 1992). Our study attempts to reconcile these seemingly contradictory findings and suggests that involvement aids information processing as it increases from low to moderate levels, but that involvement has a negative effect on information processing as it increases beyond moderate to high levels. In other words, we will argue that the relationship between program involvement and advertising effectiveness is an inverted-U relationship.

**Literature Review**

**Dimensions of Program Involvement.** There are motivational aspects or antecedents of viewer involvement (Celsi and Olson, 1988). These are captured by factors such as those described above: being an ardent soccer fan, enjoying soccer in general, or not knowing enough about soccer to become excited by it. Involvement also has a number of consequences (Celsi and Olson, 1988) and results in a subjective felt state (Mitchell, 1979). In our example, these consequences are the excitement or arousal experienced by a viewer, thoughts generated in response to the game, or feelings produced at the outcome of the game, such as happiness or disappointment. The focus of this paper is the arousal viewers experience as a consequence of involvement with a program and the effects different levels of arousal have on the processing of commercials.

It is a well-known fact that television programs lead to varying levels of arousal (Singh and Churchill, 1987). Similarly, involvement has been shown to be associated with an increase in arousal (Mandler, 1975; Murry, Lastovicka, and Singh, 1992). While the concept of involvement may be quite broad, its main components are the direction and the intensity of involvement (for a review, see Andrews, Durvasula, and Akhter, 1990). The involvement in our research is directed toward the program and its intensity is the internal state of arousal or excitement experienced by the viewer. This conceptualization of *involvement intensity* is a common one (for a review, see Andrews, Durvasula, and Akhter, 1990; Burnkrant and Sawyer, 1983; Cohen, 1983; Day, 1973; Mitchell, 1979; Pavelchak, Antil, and Munch, 1988) and, in fact, program involvement has been measured in terms of arousal (Bello, Pitts, and Etzel, 1983; Murry, Lastovicka, and Singh, 1992).

**Effects of Arousal on Information Processing.** The effects of arousal on information processing and behavior were introduced into consumer behavior by Kroeber-Riel (1979). In brief, a stream of research based on the Yerkes-Dodson Law (1908) postulates that arousal has a positive effect on task performance as it increases from a resting level to moderate levels of arousal beyond which an increase in arousal causes a decrease in performance. This inverted-U relationship has been widely replicated (e.g., Berlyne, 1960; Easterbrook, 1959; Mandler, 1975) for a variety of tasks, such as memory tasks (for a review, see Eysenck, 1982).

The processes underlying the inverted-U relationship are still debated. The ascending part of the curve has been attributed to an increase in the natural speed of cognitive processing as arousal increases above its resting level (Eysenck, 1982; Silk and Vavra, 1974; Srull, 1993) and is possibly due to an increase in total attentional capacity to its highest level at moderate levels of arousal (Kahneman, 1973). The detrimental effects of high arousal appear to be caused by a reduced ability to engage in shared or parallel processing.
(Eysenck, 1982), the production of a large number of internal cues, and the focus on the arousal state itself versus the cues, and the focus on the (Eysenck, 1982), the production of an inverted-U relationship be-

an inverted-U relationship generally been contrasted in past research. This, of course, prohibits the inverted-U relationship found in the arousal literature from emerging. Indeed, one paper that measured a continuum of program involvement found an inverted-U relationship between program involvement and the recognition of billboards along the periphery of a soccer field (Pham, 1992). However, because billboards compete with the program for viewers’ attention, the effect of program involvement was explained in terms of viewers’ visual focus of attention. Arousal was conceptualized separately and was found to decrease recognition (Pham, 1992).

Research Objectives

The Effect of Program Involvement on Memory. While Kroebert-Riel observed that there exist “very few examples of the negative effect of very strong arousal” (1979), arousal has generally been found to decrease performance in consumer behavior studies. For example, in the research on program involvement the dominant position for-
warded is that low involvement programs lead to better brand and message recall (Bryant and Comisky, 1978; Kennedy, 1971; Pavelchak, Antil, and Munch, 1988; Soldow and Principe, 1981). It is argued that high program involvement leads to more effort spent in watching a program and thereby to lower elaboration on the embedded commercials. The opposite position, that commercials are more effective when viewed in high-involvement programs, has also been forwarded (Singh and Churchill, 1987; Siebert, 1978). This and other research argue that arousal results in a more vigilant and acute processing of information which in turn leads to an increase in memory (Silk and Vavra, 1974; Srull, 1983).

We suggest that these seemingly contradictory findings can be accounted for by the inverted-U relationship found in the arousal literature. For example, the Pavelchak, Antil, and Munch (PAM) study (1988) used self-selected viewers of a Superbowl. The viewers who were supporters of one of the participating teams were more involved and experienced higher levels of arousal than neutral viewers who had superior memory for commercials. However, one could argue that even neutral viewers were at least moderately aroused and that the PAM study only captured the descending slope of the inverted-U curve. Therefore, it is possible that the PAM study only captured the inhibiting effects of arousal as it is increased from moderate to high levels. Specifically, we speculate that, had viewers been included in the PAM study who had very low involvement with the Superbowl, the inverted-U relationship would have surfaced between program involvement and memory for the embedded commercials, as typically found in the arousal literature. More formally,

H1: We expect an inverted-U relationship between memory for advertised brands and a continuum of low to high program involvement.

The Effect of Program Involvement on Attitude toward the Ad. In the consumer behavior literature on attitude formation the dominant view is again that program involvement or arousal lead to a reduced ability to process advertisements in depth. For example, a recent study showed that weak messages are more persuasive in high-involvement programs, but that strong messages are more persuasive in low-involvement programs (Anand and Sternthal, 1992). Similarly, strong arguments were found to be more persuasive and weak ones were less persuasive under moderate versus high levels of physiological arousal (Sanbonmatsu and Kardes, 1988). The reasoning was that high involvement or arousal reduces the ability to think, thereby inhibiting the formation of counterarguments for weak messages versus inhibiting support arguments for strong messages (e.g., Petty and Cacioppo, 1986).

However, Sanbonmatsu and Kardes (1988) did not include low levels of arousal in their study and themselves suggest that low levels of physiological arousal may also have reduced the ability to think. From this standpoint the inverted-U hypothesis may again be able to explain inconsistent findings on the impact of advertising context on \(A_{\text{ad}}\). For example, highly involving programs have been shown to lead to higher \(A_{\text{ad}}\) (Kennedy, 1971), as well as to the opposite, namely lower \(A_{\text{ad}}\)
(Murry, Lastovicka, and Singh, 1992; Soldow and Principe, 1981). As discussed previously, the ability to process information should be highest under moderate versus both low or high levels of program involvement. And it is possible that some studies manipulated involvement on the ascending part of the inverted-U curve (i.e., comparing low to moderate levels of program involvement) while others manipulated the descending part (i.e., comparing moderate to high levels).

Prior research on program involvement has had to rely on sung versus spoken versions of the same message in order to achieve differences in message strength via ease of processing, because "it seemed unlikely that practitioners could be prompted to employ weak advertising messages purposely" (Anand and Sternthal, 1992). Because we use real advertisement stimuli, it is assumed that the commercials selected for this study do not include weak messages. Therefore, we expect the same inverted-U relationship between $A_{ad}$ and program involvement as for memory. Because moderately involved viewers should have a higher ability to consider the message in depth compared to both viewers with low and high involvement, their resulting attitudes should also be highest (Petty and Cacioppo, 1986). More formally,

H2: We expect an inverted-U relationship between $A_{ad}$ and a continuum of low to high program involvement.

**The Slotting of Commercials.** Different parts of television programs are differentially arousing. For example, viewers’ arousal should be higher for televised sports during the game itself versus at half-time or following the game, that is, when arousal wears off. Therefore, a comparison of commercials slotted during the game itself versus outside the game offers a comparison of viewers at the same level of program involvement who, however, have different levels of arousal at the time a commercial is watched. Because program involvement is an overall measure, the arousal experienced for viewers at every level of involvement should be higher at the time a commercial is watched if a commercial is shown during the game compared to when it is shown outside the game. For example, viewers with high program involvement should experience higher than optimal levels of arousal during the game. The subsequent wearoff, say during half-time, should benefit the information processing of these viewers. On the other hand, viewers with low levels of program involvement may already experience below-than-optimal arousal during the game and a further wearoff should be detrimental to information processing.

This reasoning translates into an interesting additional test of the inverted-U hypothesis. Specifically, when commercials are shown during the game the level of program involvement that represents an optimal arousal level will be lower-than-optimal for commercials shown outside the game, because this arousal wears off by then. Instead, the level of program involvement which is slightly higher-than-optimal during the game should represent an optimal level of program involvement for commercials shown outside the game because of the wearoff of arousal. This should cause the hypothesized shift from an increase in ad memory and $A_{ad}$ to a decrease—the peak of the inverted-U curve—to occur at a lower level of program involvement for a commercial shown during the game compared to at half-time or following the game. Specifically,

H3: We expect the shift from an increase to a decrease in ad memory and $A_{ad}$—the peak of the hypothesized inverted-U curve—to occur at a lower level of program involvement when commercials are shown during versus outside of a soccer game.

The slotting of commercials is also of interest from a second perspective. It has been argued that program-interrupting commercials annoy viewers for all types of programming and may lead to lower $A_{ad}$ (Steiner, 1963), especially if viewers desire a continuation of the programming (Schumann and Thorson, 1990). These findings may be amplified for televised soccer games which offers no natural breaks. That is, commercials shown during the game actually force viewers to miss part of the action. Anecdotal evidence from the 1990 World Cup for which there were commercial interruptions suggests that many non-Spanish speaking viewers watched the games on the Spanish cable channel *Univision* in order to not miss part of the action. To avoid this "boycotting" behavior and viewer dissatisfaction, the 1994 World Cup eliminated commercial interruptions.

Moreover, we expect that the level of annoyance with commercials should be higher at higher levels of program involvement. If these ad-generated feelings influence $A_{ad}$ (Edell and Burke, 1987; Steiner, 1963), a negative relation between program involvement and $A_{ad}$ is expected. However, exactly the
opposite effect has also found support, namely that arousal—which is also higher at high levels of program involvement—positively carries over onto the commercials causing a positive relationship between program involvement and A_{ad} (Krugman, 1983). Our experiment allows us to test these competing views.

An Alternative Explanation of Excitation Transfer. A possible alternative explanation for an inverted-U finding can be based on a similar idea of excitation transfer. In contrast to Krugman (1983), Berlyne (1960) theorized that people find both low and high levels of arousal unpleasurable. Because the excitation produced by a program can be misattributed to the embedded commercial—as long as the viewer is not aware of the source of arousal (Mattes and Cantor, 1982)—a simple process of affect transfer could explain the hypothesized effect of program involvement (Schumann and Thorson, 1990) on A_{ad}. That is, because the arousal-induced pleasure may be highest at moderate levels of program involvement, attitudes may also be highest at that point.

In the case of excitation transfer, however, the effect of program involvement on commercial messages should be the same regardless of message content. Specifically, the inverted-U relationship should surface whether a commercial presents arguments that can be centrally processed or whether it contains only the brand name and a short slogan—as for sponsorship messages. Excitation transfer would affect both commercials and sponsorship messages alike. We propose that, because there are no arguments in sponsorship messages that viewers could differentially process in depth (Petty and Cacioppo, 1986), program involvement should not have an effect on their evaluation. A finding of the predicted effect of program involvement on commercials (H2) contrasted with a lack of an effect of involvement on sponsorship messages would rule out the excitation-transfer hypothesis (Schumann and Thorson, 1990).

H4: We expect that there is no effect of program involvement on the evaluation of sponsorship messages.

Research Design

Based on the finding that the observed variance can be greater within programs than between programs (Yuspeh, 1979), we operationalize arousal as involvement with a single program. We selected a televised soccer game and viewers ranging along a continuum of low to high program involvement. The viewers were not supporters of either team. By using this operationalization we hoped to avoid the myriad of potential confounds inherent in the comparison of programs as different as comedies and suspense thrillers (e.g., Kennedy, 1971). Moreover, soccer is the world's most popular sport and is currently experiencing tremendous growth in the United States (US News and World Report, 1994). And with the wide viewership of sporting events in general, we believe that this type of programming is particularly relevant to advertisers.

Experimental Design. The study was conducted in 1992 and has two experimental conditions. In both conditions subjects saw a summary of the first-half highlights of the 1990 World Cup game between Germany and The Netherlands followed by the entire second half and a post-game show, including highlights and interviews. In the intrusive condition five sets of three commercials interrupted the game and made viewers miss the action for the duration of the commercials, as in the 1990 World Cup. There were no commercials shown outside the game. In the nonintrusive condition the identical commercials were shown in the same order as in the intrusive condition (The Abdominizer, Mars, Old Spice, Players Club, the Army, TNT Movies (sponsorship), Gatorade (sponsorship), Santa Fe (sponsorship), Micatin (sponsorship), Budweiser, NBA, Citizen, Coca-Cola, NFL, and Tums). The game, however, was shown without any commercial interruptions—as in the 1994 World Cup—and one set of commercials was shown at half time between the first half summary and the second half; a second set was shown between the game and the post-game show. Program involvement and all dependent measures were collected following the post-game show in both conditions.

Subjects. Eighty-six university students—forty-three were randomly assigned to each condition—were recruited to participate in the approximately 80-minute experiment. Participation was a class requirement in order to attract viewers with low levels of program involvement as well. The subjects included active soccer players. Subjects received $5 and a chance to win $200 for their participation. The $200 was awarded based on a lottery.

While the choice of a student sample may restrict the generalizability of the findings, students may be particularly appropriate for the purposes of this study. As many soccer enthusiasts are aware, soccer's tremendous growth in the United States is only a recent phenomenon. For example, the 16.4 million soccer participants in 1993 represent a
77 percent increase over 1984 participation levels (US News and World Report, 1994). In addition, a vast majority (85.8 percent in 1992) of U.S. soccer players are under the age of 25 (The 1993 National Soccer Participation Survey). These figures indicate that the current bulk of soccer enthusiasts are college age or younger. A wider sample of respondents would have therefore biased the low-involvement group toward an older age bracket. Coupled with the choice of real advertisements this would have made an interpretation of the results extremely difficult. The relative homogeneity of our student subjects therefore allows for both a broad range of program involvement and a more rigorous test of the hypotheses (Calder, Phillips, and Tybout, 1981; Kruglanski, 1975).

**Independent Variables.** Condition was coded as a dummy variable in the subsequent regression analyses (1 = intrusive; 0 = nonintrusive). Program involvement was measured using a scale consisting of eight statements each followed by 7-point Likert-type scales anchored by: 1 = strongly disagree and 7 = strongly agree. This scale was developed to capture both the enduring antecedents of program involvement (Celsi and Olson, 1988) ("I am a soccer fan," "I will watch many World Cup '94 games on TV," "I can play soccer well," and "How many World Cup '90 games did you see on TV?" [1 = none, 7 = six or more]) and its consequences (Celsi and Olson, 1988), or subjective felt state of program involvement (Mitchell, 1979) ("I think watching the game was exciting," "I enjoyed watching the game," "At times I really 'got into' the game," and "So far, I regret having participated in this study"). The reliability and dimensionality of the scale were assessed using Cronbach’s alpha and exploratory factor analysis. Confirmatory factor analysis loadings are used to sum the items as a weighted index of program involvement.

**Dependent Variables.** Subjects’ mood (“I am presently in a good mood”) and overall annoyance with the commercials (“The commercials I saw were annoying”), as well as attitude toward advertising (“Advertisers’ effect on soccer in general is very helpful”) were measured using the same 7-point scales. Following these scales was a free-recall task and a recognition task including distractors (NHL, Becks, Snap-Up, HBO, Pepsi, Brut, M&M’s, Rolaid, ESPN, Tinactin, Soloflex, the Hair Club, the Navy, and Timex). The A$_{sd}$ semantic differential scale (anchored by good and bad and coded from 7 to 1) was the final task. While single-item attitude scales are expected to be less reliable, a recent review and meta-analysis of the A$_{sd}$ literature (Brown and Stayman, 1992) found no significant effects of using multi-item scales versus single-item scales on the validity of the relationship. The sum of the attitude scores across all commercials was used as an index of A$_{sd}$.

The attitude scores toward the sponsorship brands (Gatorade, Micatin, and TNT Movies) were summed to create an attitude index for sponsorship messages. Due to an oversight on the questionnaire, attitude toward one of the sponsorship brands (Santa Fe) was not measured.

**Results**

**Involvement.** The validity of the involvement scale was assessed prior to testing the hypotheses. These tests indicate that the scale reliably measured a single construct, namely “involvement.” The involvement scale including all eight measures was reliable as measured by Cronbach’s alpha ($\alpha = .94$) with no improvement possible by dropping any of the items. A post test ($n = 77$) also showed our program-involvement scale to be highly correlated with Zajcikowsky’s (1985) personal involvement inventory ($p = .71; p < .0001$). Moreover, an exploratory factor analysis using all eight measures identified only one factor with an eigenvalue greater than one (5.7) on which each item loaded positively above .74 (.84 average). A confirmatory factor analysis was subsequently performed on the eight program-involvement measures, each of which was found to load positively and significantly on the involvement construct (all t-values exceed 7.0). Standardized coefficient loadings ranged from 0.68 to 0.93 with associated R-squared measures of 0.46 to 0.86. The standardized factor loadings obtained in the confirmatory factor analysis were used to weight each of the eight items. These weighted scores were summed to create an index of overall program involvement.

The program involvement index covered the possible range from a low of 6.5 to a high of 45.8 with an overall mean of 29.5. The individual means for involvement with the game itself did not differ statistically be-
between the two conditions \((p > .7)\). Therefore, a shift in the peak of the inverted-U curve (H3) can be attributed to a wearoff in the level of arousal along the continuum of program involvement rather than a priori differences between the conditions.

**Overview of Findings.** The memory and attitude measures support the hypothesis that the ability to process information varies along the continuum of low to high program involvement in terms of an inverted-U relationship (H1). Memory performance increased for both the recall and recognition as involvement increased from low to moderate levels and then decreased as involvement increased further to high levels. The finding that the peak of this curve occurs at lower levels of program involvement for recall (but not recognition) in the intrusive condition (H3) supports the theoretical basis proposed to explain this effect, namely an arousal-driven explanation (see Figure 1).

The same inverted-U relationship also surfaced for \(A_r\) along the involvement continuum (H2). Viewers had the most positive attitudes under moderate levels as compared to both low and high levels of program involvement. In comparison, attitudes toward the sponsorship announcements—which have very little message content that could be differentially processed—were not affected by program involvement (H4). Therefore, both the memory and attitude measures support the notion that advertising effectiveness is highest under moderate as compared to low and high levels of program involvement. These findings are discussed in more detail below.

**Recall.** Subjects' recall of the 15 brands (overall mean = 4.9) was influenced by both the level of program involvement and the viewing condition. The inverted-U relationship for recall along the continuum of program involvement (H1) was confirmed in a regression analysis (see Table 1) by a positively signed and significant coefficient for involvement \((p < .0001)\) and a negatively signed and significant coefficient for involvement squared \((p < .0001)\). The shift of the peak of the inverted-U curve to a lower level of program involvement in the intrusive condition (H3) is suggested by a significant and negatively signed interaction coefficient between condition and involvement \((p < .05)\). The authors were unable to find a test which directly examines the difference between the peaks of two quadratic functions (this test would require testing the difference between two Cauchy distributed variables).
peak in recall along the involvement index was at 26.1 for intrusive compared to 31.5 for nonintrusive commercials.

The significant interaction term also indicates that the inverted-U curve for the nonintrusive condition is "flatter." This can be explained by the probable wearoff in arousal in that condition. That is, because arousal levels induced by the game converge outside the game, the reduced range in arousal results in smaller differences in recall among viewers with different levels of involvement. There was also an overall recall advantage for intrusive over nonintrusive placements of commercials (p = .005). This effect was not anticipated and may have occurred because intrusive commercials had an element of surprise or simply because they were shown in smaller sets of commercials. The effects are tabulated in Table 1 and shown graphically in Figure 1.

**Recognition.** For the recognition measure (overall mean = 11.2 out of 15) the regression (see Table 1) again demonstrated the inverted-U relationship (H1) with a significant and positively signed coefficient for involvement (p = .05) and a significant and negatively signed coefficient for involvement squared (p = .05). The main effect for condition (p = .0001) again showed that intrusive commercials are better remembered overall. There were no significant interaction effects for the recognition measure, and H3 was not confirmed for recognition. These slightly weaker results on the recognition measure may be due to the overall high level of recognition which could have resulted in a ceiling effect.

**Attitude toward the Ad.** Because of missing values on the A_ad scale five observations had to be dropped in the regression analysis of the A_ad index. The inverted-U relationship (H2) emerged for A_ad (overall mean = 48.9 out of a possible range of 11 to 77) along the continuum of program involvement was demonstrated by a significant and positively signed coefficient for involvement (p < .01) and a significant and negatively signed coefficient for involvement squared (p = .01). Moreover, this relationship did not emerge for the sponsorship brands (p's > .77) lending support to H4. The regression results for A_ad are summarized in Table 2.

Subjects who were more involved with the game also reported being in a better mood (p < .001) in both conditions. However, neither mood nor "attitude toward advertising" had any significant effects on recall or A_ad as simple or second-order terms. This further rules out the competing explanation of transfer of affect (Schumann and Thorson, 1990). There was, however, some support for the power of feelings on A_ad (Edell and Burke, 1987). Annoyance with the commercials was linearly influenced by program involvement, as well as by condition (R^2 = .38). Subjects were more annoyed in the intrusive condition (p < .005) and more annoyed the higher their level of program involvement (p = .0001). This annoyance had a marginal negative impact (p < .1) on A_ad (see Table 2).

**General Discussion**

**Limitations.** As discussed earlier, the choice of student subjects seemed particularly appropriate for the study. However, student subjects can limit the generalizability of the findings to the general population. For example, students may generally be more cognitively engaged or may try harder to "do well." However, the purpose of the research was to demonstrate a difference for advertising effectiveness at different levels of program involvement, and there is no reason to believe that this inverted-U relationship should not hold for other segments of the population (e.g., Calder, Phillips, and Tybout, 1981; Kruglanski, 1975).

Another limitation is that the findings rely on an audience that is not self-selected. Audiences may not always include the full range of viewers from low to high levels of program involvement, especially for different types of programs. Moreover, advertising effectiveness is affected by behaviors such as talking, leaving the room, muting of commercials, or "channel surfing." Subjects in our study were discouraged from talking or leaving the room. In practice the audience for a single program may not be as "well behaved."

Finally, memory and attitude measures were taken after only a short break which included the post-game show and involvement scales instead of after the more common 24-hour delay used by advertisers. It therefore remains unknown whether the

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2 We would like to thank one of the reviewers for pointing this out.
Table 1
Regression Results for Memory Measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression coefficient</th>
<th>t-value</th>
<th>p-value</th>
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</thead>
<tbody>
<tr>
<td>Recall</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
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<td>-0.92</td>
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<tr>
<td>Involvement (I)</td>
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<td>.0001</td>
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<tr>
<td>Involvement²</td>
<td>-0.0069</td>
<td>-4.01</td>
<td>.0001</td>
</tr>
<tr>
<td>Condition (C)</td>
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<td>2.91</td>
<td>.005</td>
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<tr>
<td>Interaction (IXC)</td>
<td>-0.0749</td>
<td>-2.21</td>
<td>.03</td>
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<th>Recognition</th>
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<tr>
<td>Intercept</td>
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<td>Involvement</td>
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<td>.05</td>
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<tr>
<td>Involvement²</td>
<td>-0.0034</td>
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<td>.05</td>
</tr>
<tr>
<td>Condition</td>
<td>1.8784</td>
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<td>.0001</td>
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</table>

Note: Overall Models: \(^aF = 5.2, p = .0008, R^2 = .21; ^bF = 7.2, p = .0002, R^2 = .21.\)
* Condition is coded as 1 = Intrusive, 0 = Nonintrusive.

Table 2
Regression Results for \(A_{ad}\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression coefficient</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A_{ad}) Commercials(^a) Intercept</td>
<td>37.36</td>
<td>5.83</td>
<td>.0001</td>
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<tr>
<td>Involvement</td>
<td>1.24</td>
<td>2.71</td>
<td>.008</td>
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<tr>
<td>Involvement²</td>
<td>-0.02</td>
<td>-2.60</td>
<td>.01</td>
</tr>
<tr>
<td>Annoyance</td>
<td>-1.05</td>
<td>-1.95</td>
<td>.06</td>
</tr>
<tr>
<td>(A_{ad}) Sponsorships(^b) Intercept</td>
<td>12.28</td>
<td>6.18</td>
<td>.0001</td>
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<tr>
<td>Involvement</td>
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<td>-0.05</td>
<td>.96</td>
</tr>
<tr>
<td>Involvement²</td>
<td>0.0007</td>
<td>0.29</td>
<td>.77</td>
</tr>
</tbody>
</table>

Note: Overall Model: \(^aF = 5.1, p = .008, R^2 = .12; ^bF = 1.1, p = .3, R^2 = .03.\)
* Condition is coded as 1 = Intrusive, 0 = Nonintrusive.
Soldow and Principe, 1981) and \( A_{ad} \) (Murry, Lastovicka, and Singh, 1992; Soldow and Principe, 1981) for heightened program involvement. The findings also qualify the practice of "cliff hanging" from a cognitive processing standpoint. Because arousal can be both too low and too high, moderately exciting portions of television programs should result in the optimal advertising effectiveness.

More speculatively, we suggest that commercials shown during exciting programs, such as playoff sports or movie thrillers, should be less complex in content to allow highly involved viewers to fully process the message. The lack of an effect of program involvement on \( A_{ad} \) for simple sponsorship messages supports this view. This tactic seems particularly appropriate because target audiences are usually those that have the highest program involvement. A related tactic previously suggested is the use of peripheral cues for audiences with high versus moderate arousal (Sanbonmatsu and Kardes, 1988). Future research should explore whether peripheral cues such as expert or celebrity endorsers are also more effective for audiences with low versus moderate arousal. Moreover, different types of television programs can result in different levels of program involvement. Those that stimulate moderate levels of arousal or excitement may be most appropriate venues for cognitively demanding commercials. However, arousal generated is only one factor involved when comparing programs as different as thrillers and comedies (e.g., Kennedy, 1971) and a myriad of other factors need to be considered as well.

Finally, the slotting of commercials also extends beyond the arousal generated by a program. For soccer in particular, the effects of feelings of annoyance generated by the commercials on \( A_{ad} \) are of interest. In most parts of the world commercials are not broadcast during a game because soccer has no natural breaks such as time-outs. With the exception of World Cup 1994, directors of American sports telecasts, on the other hand, have tended to schedule intrusive commercials during the game itself forcing the viewer to miss part of the action. Viewers obviously resent such intrusive commercials and this negatively affects their attitudes (Schumann and Thorson, 1990; Steiner, 1963). The advertisement generated feeling (Edell and Burke, 1987) of annoyance is particularly important for program involvement because it is more extreme at higher levels of involvement.

In conclusion, the research findings suggest that advertisers should consider the level of involvement an audience has with a television program. It is suggested that both low and high levels of viewer involvement are suboptimal for both ad memory and \( A_{ad} \). These findings have implications for the slotting of ads within a single program or between different types of programs which may lead to low, moderate, or high arousal. And with the rise in control over advertising placements, particularly for cable television, arousal appears to be a potentially important variable to consider for both memory and attitudes. Finally, if as for the World Cup, the target audience is likely to be highly involved then the design of commercials may need to be simplified or the increased use of peripheral cues should be considered.

References


