Enhancing the Television-Viewing Experience through Commercial Interruptions

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Consumers prefer to watch television programs without commercials. Yet, in spite of most consumers' extensive experience with watching television, we propose that commercial interruptions can actually improve the television-viewing experience. Although consumers do not foresee it, their enjoyment diminishes over time. Commercial interruptions can disrupt this adaptation process and restore the intensity of consumers' enjoyment. Six studies demonstrate that, although people preferred to avoid commercial interruptions, these interruptions actually made programs more enjoyable (study 1), regardless of the quality of the commercial (study 2), even when controlling for the mere presence of the ads (study 3), and regardless of the nature of the interruption (study 4). However, this effect was eliminated for people who are less likely to adapt (study 5) and for programs that do not lead to adaptation (study 6), confirming the disruption of adaptation account and identifying crucial boundaries of the effect.

People like watching television, but they dislike watching television commercials. Indeed, entertainment technology is substantially guided by a nearly universal desire to remove disruptions. Consumers will pay extra to subscribe to broadcasts, invest in technological innovations, or purchase recordings in pursuit of an uninterrupted viewing experience. On the one hand, given that television viewing is one of the most popular leisure activities, consumers could be expected to have the knowledge and experience to maximize their enjoyment. This suggests that removing commercials indeed increases consumers' enjoyment of the shows they are watching—as it often probably does. On the other hand, the decision to remove commercials requires consumers to accurately forecast the hedonic consequences of that decision, and this type of forecasting falls in the domain of a particularly common human shortcoming. People tend to be poor at predicting how their enjoyment of an experience will progress over time and how changes in the structure of that experience will influence their enjoyment. In fact, as we detail below, despite a widely held belief that commercial interruptions reduce viewers' enjoyment, inserting commercials may actually improve the experience of watching television.

We propose that people tend to adapt to most positive experiences, including watching television programs. For many television shows, enjoyment intensity tends to decline as the show progresses. However, commercial interruptions can disrupt this adaptation process and (at least partially) restore viewers' enjoyment to its original intensity. Thus, to the extent that consumers adapt to television shows, inserting commercials may make these shows more enjoyable by disrupting this adaptation process.

Perhaps because of a nearly unanimous intuition that commercials always reduce viewers' enjoyment, there has been almost no academic research examining the effect of commercial interruptions on consumers' reactions to the television shows in which they are embedded. Whereas several studies have examined the effect of television shows on consumers' attitude toward the embedded commercials (e.g., Goldberg and Gorn 1987; Murry, Lastovicka, and Singh 1992), we are aware of only two studies that have examined how the presence of commercials influences consumers' reaction to the shows. The first study (Cavanaugh 1984) examined how commercial interruptions influenced the cognitive processing of the program and observed that neither the presence nor the placement of commercials affected the recall or recognition of program content. More relevant for

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the current research, a second study (Finn and Hickson 1986) observed that embedding two arousing (fast paced or humorous) commercials in a news broadcast made that broadcast more enjoyable—an effect that, according to the authors, resulted from residual arousal created by the commercials.

Together, these previous findings suggest that embedding commercials in television programs does not necessarily interfere with the processing of the programs and that arousing commercials can even make the programs more enjoyable. Although these studies provide some indication that commercial interruptions may be able to improve the television-viewing experience, they do not tell us how commercials influence consumers' enjoyment of the surrounding program. To better understand this process, we need to consider prior research on how enjoyable experiences progress over time. As we will discuss next, this research not only suggests that consumers' intuition about the uniformly negative effect of television commercials is incorrect but also indicates that these commercial interruptions can, in fact, enhance the viewing experience.

DISRUPTING ADAPTATION TO TELEVISION PROGRAMS

Prior research on the progression of affect shows that, with some exceptions, people generally tend to adapt, making positive experiences less enjoyable over time (Frederick and Loewenstein 1999). This process of adaptation operates on a variety of experiences, across different levels of scope, intensity, and familiarity. People seem to adapt to enjoyable geography (Schkade and Kahneman 1998), repeated consumption of their preferred ice cream (Kahneman and Snell 1990), repeated exposure to a well-liked song (Galak, Kruger, and Loewenstein 2008), improvements in salary (Frey and Stutzer 2002), and even winning the lottery (Brickman, Coates, and Janoff-Bulman 1978). Given the wide range of positive experiences that people adapt to, we propose that consumers will also adapt to the experience of watching an enjoyable television show.

If people adapt to enjoyable television shows, then how do commercial interruptions affect their enjoyment? We propose that interruptions tend to disrupt adaptation, resulting in a partial resetting to the initial higher intensity of enjoyment. There are at least three empirical findings that provide support for this hypothesis. First, in the negative domain, reminders disrupt people's adaptation to bereavement and, as a result, intensify grief (Shuchter and Zisook 1993). Second, volitional disruption of daily activity has been shown to produce long-term changes in well-being (Lyubomirsky, Sheldon, and Schkade 2005). Finally, and most relevant to the current research, several enjoyable but monotonous experiences (i.e., sitting in a massage chair or listening to a looped song fragment) have been shown to be more enjoyable when disrupted than when experienced continuously (Nelson and Meyvis 2008). Together, these previous findings suggest that commercial interruptions may disrupt consumers' adaptation to television shows, thus restoring the intensity of the experience and increasing enjoyment of the program.

The process by which disruption of adaptation intensifies experiences is best understood in light of prior research on habituation, that is, decreased response to repeated or prolonged exposures (Harris 1943). Specifically, the intensifying effect of disruption follows from two of the central tenets of habituation: spontaneous recovery and dishabituation (Thompson and Spencer 1966). First, spontaneous recovery suggests that in the absence of stimulus presentation, the sensitivity to that stimulus will gradually return. In the language of consumption, when consumers avoid an experience that they have habituated to, the habituation decreases, and enjoyment of that experience returns. Second, according to the principle of dishabituation, the introduction of a novel stimulus will have an effect similar to the absence of the original stimulus, namely, decreased habituation. Within the context of television viewing, we can think of commercials as activating both mechanisms: they allow for time to pass, thus allowing enjoyment to spontaneously recover, and they act as a novel experience, thus dishabituating consumers with respect to the television program.

Our prediction is also consistent with recent work linking satiation and categorization. Specifically, Redden (2008) demonstrated that when repeated consumption was subcategorized, feelings of satiation decreased. More specifically, when consumers perceive more components to a consumption experience, they perceive greater variability and thus experience less satiation. In the context of television, one could imagine that the inclusion of a commercial interruption could result in consumers construing the program as multiple discrete units and thus feeling less satiated than when the same program is construed as a single continuous experience.

Yet, if commercial interruptions improve the television-viewing experience, then why do consumers expend so much effort to avoid them? In fact, consumers' preference for experiencing television programs without interruptions extends to many other types of positive experiences. People stockpile vacation days to create an extended leisure experience, turning off their phones and shutting down their computers to ensure an uninterrupted event. Similarly, the radio station that plays songs in their entirety will be preferred to the one that disrupts songs with announcements and advertisements. We propose that there are several reasons why consumers are so reluctant to interrupt enjoyable experiences such as watching television programs.

First, people often fail to realize that they adapt to pleasant experiences and thus do not appreciate that interruptions can intensify these experiences by disrupting the adaptation process. Indeed, although people vary greatly in their intuitions about how hedonic experiences progress over time (Snell, Gibbs, and Varey 1995), they generally tend to underestimate the extent to which they adapt to experiences (Loewenstein and Frederick 1997). For instance, people underestimate their adaptation to a moderately irritating noise

(Nelson and Meyvis 2008) and overestimate the duration of their affective reaction to discrete events (Wilson and Gilbert 2003). Given that people have difficulty predicting how their affective experiences evolve over time, they may underestimate the extent to which they adapt to an ongoing television show and thus fail to realize the beneficial, adaptation-disrupting effect of commercial interruptions.

Second, aside from being unaware of the beneficial effects of commercial interruptions, consumers may also overestimate the negative impact of these interruptions. Consumers tend to enjoy a television show more when they are deeply immersed in it, that is, when they experience "transportation" (Green and Brock 2000) or "flow" (Csikszentmihalyi, Abuhamdeh, and Nakamura 2005). Certainly, advertisements can potentially disrupt this experience, leading to lower evaluations of the advertised product (Wang and Calder 2006). However, consumers may be overestimating the amount of continuity that is required to create this enjoyable experience, or, stated differently, underestimating their ability to ignore the interruptions and immerse themselves in the program.

Third, regardless of their intuitions about the effect of interruptions on their overall enjoyment of the show, consumers may prefer to watch television programs without interruption because of hedonic myopia. Since commercials tend to be less entertaining than the television shows in which they have been embedded, at every moment, watching more of the television show is more enjoyable than switching to a commercial. Thus, although watching an entertaining sitcom may become gradually less enjoyable as time progresses (and thus benefit from being interrupted), at every given moment, watching the sitcom will still be more enjoyable than watching a detergent commercial. Thus, even if consumers would realize that commercial interruptions can make their overall experience more enjoyable, they will still prefer to avoid these interruptions if they are more sensitive to immediate changes in their enjoyment than to subsequent changes in their enjoyment of the program. Consistent with this last assumption, people have been shown to routinely ignore the impact of their current choices on the future desirability of their options, a phenomenon known as melioration (Herrnstein and Prelec 1992).

Finally, commercial interruptions will not always improve the viewing experience, thus producing a variability in consumers' experience that may obscure any systematic pattern. Indeed, although commercial interruptions will generally disrupt adaptation, they can clearly affect viewers' experience through other processes as well—and many of these processes may actually decrease enjoyment of the show. For instance, commercials that are particularly unpleasant or tedious may contaminate the surrounding program with the negative affect they produce. Alternatively, commercials may also reduce people's enjoyment of the show when they elicit a mood that is incongruent with the mood elicited by the show (e.g., a humorous commercial interrupting a heartbreaking story). Furthermore, although all commercials can disrupt adaptation, not all programs will generate patterns of adaptation. Complex story lines may lead to less adaptation and, as a consequence, benefit less from interruptions.

The current research employs a variety of programming (e.g., a sitcom, an animated short, nature documentaries, and a music video) to demonstrate the beneficial effect of commercial interruptions. In order to best test the disruptive effect of commercials, we generally restrict our research to commercials that do not elicit extreme affective reactions (e.g., no antidrug commercials) and to programs that are not exceptionally complex or fast paced. However, in the last study, we will test whether commercial interruptions are indeed less beneficial for videos that people are less likely to adapt to.

OVERVIEW OF THE CURRENT RESEARCH

We propose that consumers often adapt to watching television shows, making the experience less enjoyable as the show progresses. Moreover, commercial interruptions disrupt this adaptation process and partially restore consumers' enjoyment to its original level. Thus, commercial interruptions can actually make television programs more enjoyable, even though consumers strongly prefer to avoid commercials. We investigate this possibility in six studies; in each study, participants watched either a continuous or a disrupted version of a video program, after which they rated their enjoyment of the program. In addition, in three of the studies we also asked a separate group of forecasters to predict the enjoyment of the people watching the different versions of the program (to verify that consumers' intuitions also extended to the specific procedures used in the studies). The first study tested whether participants enjoy an episode of the *Taxi* sitcom more when commercial interruptions are included than when they have been removed. The following studies rule out an explanation based on contrast effects (study 2), control for the mere presence of the commercials (study 3), and extend our findings to noncommercial interruptions (study 4). We then sought to identify boundaries for the effect by demonstrating that the beneficial effect of commercial interruptions disappears for people who are slower to adapt (study 5) and for video clips that people are less likely to adapt to (study 6).

STUDY 1

Method

Eighty-seven undergraduate students with no prior opinions about the show *Taxi* were selected from a larger set of participants ($n = 138$) who completed the pretest. Participants watched the episode "Louie's Mother" in exchange for $10. The program was recorded exactly as it was aired in syndication in 2005, including the commercial advertisements. The commercials were local advertisements (Jewelry Factory Store, the Law Office of Michael Brownstein) as well as network promotions for television shows (*Geraldo*, *Judge Hatchet*, *The Simpsons*, *Bernie Mac*, and *Inside*

Edition). Approximately half the participants watched the program as is, whereas the remaining participants watched a version with the commercials removed.

After the program ended, participants answered five questions about the experience. Since we were particularly concerned about scaling effects that might result from comparisons between the program and the advertisements, our primary measure asked people to compare the program to a similar program, *Happy Days*, using an 11-point relative preference scale (-5 = would definitely prefer *Happy Days*; +5 = would definitely prefer *Taxi*). Additionally, participants used 9-point scales to indicate how funny they thought the episode was, how much they enjoyed the episode, and how much they enjoyed the experiment. Finally, they reported how much they would be willing to spend for a three-DVD set compiling a season of the program (valued at $40). A second group of participants with no prior opinion about *Taxi* ($n = 74$), the forecasters, read a detailed description of either the continuous condition or the disrupted condition and were asked to estimate experiencer responses.

Results and Discussion

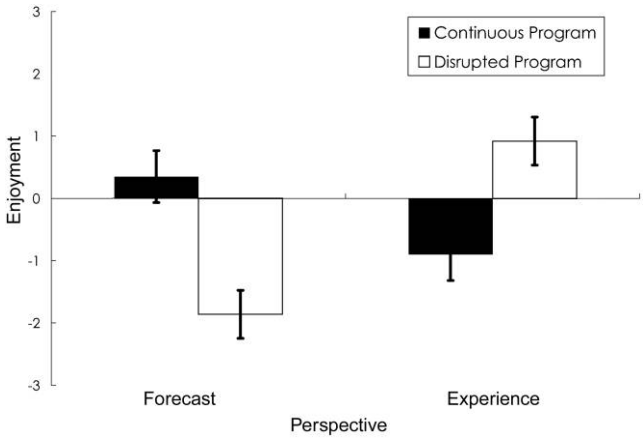
Forecasters. Forecasters predicted that commercial disruptions would worsen the program. They thought that the disrupted program would be less preferred to the comparison program ($M = -1.86$ vs. 0.35; $t(72) = -3.64$, $p = .001$; see fig. 1) and generally less favorably evaluated across a composite of the four remaining measures ($\alpha = .73$; $M = -0.29$ vs. 0.24; $t(72) = -3.91$, $p < .001$).

Experiencers. In contrast to the forecasters' predictions, experiencers actually enjoyed the program more when it was shown with commercials than when it was shown without. Participants who had watched the show with commercials preferred it to the alternative program ($M = 0.92$), whereas participants who had watched the show without commercials preferred the alternative program instead ($M = -0.90$; $t(85) = 3.14$, $p = .002$; see fig. 1). Similarly, the composite measure of the four remaining items ($\alpha = .88$) showed that participants enjoyed the program more when it was interrupted by commercials ($M = 0.20$) than when the commercials had been removed ($M = -0.16$; $t(85) = 2.18$, $p = .032$).

Interrupting the *Taxi* episode made the program more enjoyable. This is consistent with our hypothesis that commercials disrupt adaptation, thus helping to maintain an overall high level of enjoyment. However, it is also possible that the disrupted program seemed more enjoyable because participants contrasted the program against the unappealing commercials. Indeed, in a separate pretest ($n = 92$), participants who were shown one of five 60-second representative clips of the target video and two of the seven 30-second commercials reliably preferred the target clip over the commercials (67.4% selected the target clip; $\chi^2(1) = 11.13$, $p < .001$). In the next study, to test whether participants contrasted the program against the commercials, we disrupted a program with an advertisement that was just as enjoyable as the program itself.

FIGURE 1

STUDY 1—PREFERENCE FOR THE TARGET PROGRAM (*TAXI*) RELATIVE TO AN ALTERNATIVE PROGRAM (*HAPPY DAYS*) AS A FUNCTION OF THE PRESENCE OF COMMERCIAL INTERRUPTIONS



NOTE.—Error bars in all figures represent standard errors.

STUDY 2

Method

One hundred and two undergraduate students were paid $10 for their participation in an experimental session consisting of this study as well as other unrelated studies. Participants first watched a 25-second animated clip used for comparison later on. Next, they watched the target clip (*Duel* by Raf Anzonin), which ran for approximately 4 minutes and depicted an animated sword fight between two pirate characters. Approximately half of the participants watched the program without interruption, whereas the other participants watched it with an interruption by a single 30-second commercial for Bell South Yellow Pages consisting of clowns fighting. To rule out evaluative contrast effects, we selected a commercial that was at least as likeable as the program. A separate group of 41 undergraduate students watched both the sword fight and the commercial and rated their relative preference (-4 = I liked the commercial more; 0 = I liked both videos about the same; +4 = I liked the sword fight clip more). Participants showed a nonsignificant preference for the commercial over the sword fight clip ($M = -0.44$; $F(1, 40) = 1.08$, $p = .304$).

After watching both clips, participants first rated their relative preference between the first clip and the target clip (on a 7-point scale: 1 = I strongly prefer the first clip; 7 = I strongly prefer the second clip) and then indicated their willingness to pay for a DVD with similar clips ("If you were given $20, how much would you be willing to

give back for a DVD compilation of 15 shorts by the director of the video clip you just saw?").

If advertisements indeed improve the viewing experience by disrupting adaptation, then we should replicate the effect observed in study 1. Alternatively, if advertisements enhance the programming through evaluative contrast, then this design should eliminate the effect.

Results and Discussion

Consistent with our disruption of adaptation account, the commercial disruption made the program more enjoyable ($M = 5.38$ vs. 4.47; $t(100) = 2.43$, $p = .016$). Furthermore, after log transforming the willingness to pay measure, we found that people were willing to pay more for the compilation DVD after seeing the interrupted version than after seeing the continuous version (unadjusted $M = \$5.42$ vs. \$4.18; $t(100) = 2.00, p = .048$). Even an equally enjoyable disruption still improved the program, thus effectively ruling out a contrast effect explanation.

The next study tested the disruption of adaptation account while simultaneously controlling for the mere presence of the advertisements. All participants saw the same program and the same advertisements, but by varying the structure of presentation, some people saw a continuous program, whereas the remainder saw the disrupted program. Additionally, to test the adaptation prediction, we also asked participants to separately report their enjoyment of different parts of the program.

STUDY 3

Method

One hundred forty undergraduate students were paid \$8 to watch and evaluate a brief nature documentary. Participants were seated behind individual computers and first watched a brief (15 seconds) nature segment depicting the behavior of grizzly bears and reported how much they enjoyed watching this clip. Participants then watched a 3-minute nature video about ducks (the target program) as well as two television commercials (Body by Jake and the Hyundai Challenge).

For approximately half of the participants, one ad was presented immediately before and immediately after the duck video, thus preserving the continuity of the program. For the remaining participants, one commercial was inserted 60 and 120 seconds into the documentary, thus disrupting their experience of the program. In sum, unlike in the first two studies, all participants watched the video with advertisements, but those advertisements were only disruptive for some of the participants. The order of presentation of the two commercials was counterbalanced and did not influence any of the dependent measures.

After watching the video, participants answered four questions about their experience. First, they indicated how much they enjoyed the duck documentary (on a 9-point scale: 1 = I did not like it at all; 9 = I liked it very much). Second, since enjoyment of the nature documentary could plausibly increase participants' general support for wildlife, participants also specified how much they would be willing to donate to a wildlife preservation group if we were to give them \$1 million (using a 9-point scale: 1 = not a penny; 9 = all of it). The final two questions measured adaptation by asking participants to separately rate their enjoyment of the first and second half of the duck documentary. If people adapt to the show, then we would expect participants who experience the documentary continuously to show a reliable drop in enjoyment of the second half relative to the first. If advertisements disrupt this adaptation, then these effects should be reduced in the interrupted condition, and participants in this condition should enjoy the second half as much as the first. In addition, a second group of students ($n = 120$), the forecasters, watched the grizzly bear clip, read a description of either the disruption condition or the continuous condition, and predicted the responses of the experiencers in that condition.

Results and Discussion

Forecasters. Participants thought that advertising disruptions would worsen the duck documentary. Controlling for pretest liking of the bear clip, people who read about the continuous video thought that it would be more enjoyable than did people who read about the disrupted video (adjusted $M = 4.00$ vs. 3.14; $F(1, 117) = 6.85$, $p = .01$).

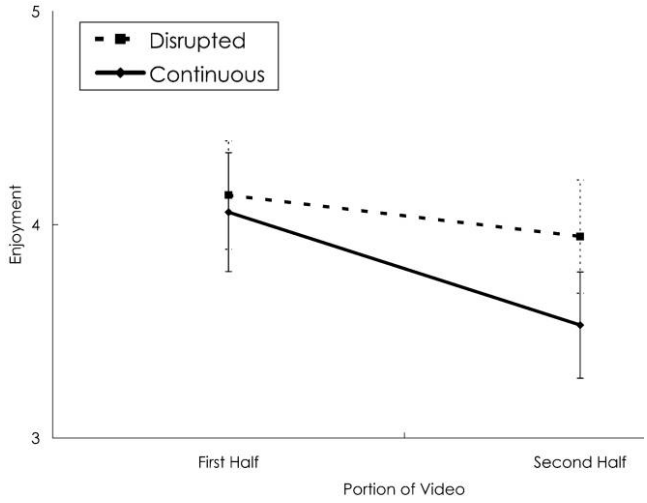
Experiencers. Participants enjoyed the duck documentary more when it was interrupted by advertisements than when it was played continuously. Controlling for liking of the bear clip, the disrupted experience was rated as more enjoyable (adjusted $M = 4.13$ vs. 3.54; $F(1, 137) = 4.18$, $p = .043$) and increased the amount of money they would donate to wildlife preservation (adjusted $M = 4.61$ vs. 3.93; $F(1, 137) = 4.65$, $p = .033$).

Furthermore, participants' separate evaluations of the first and second half of the video provided support for the disruption of adaptation account of the effect. As predicted, participants who watched the continuous video clip enjoyed the second half less than the first half ($M_{1st} = 4.06$, $M_{2nd} = 3.53$; $t(67) = 2.24$, $p = .029$), but participants whose experience was disrupted by the advertisements did not report any difference in enjoyment between the two halves ($M_{1st} = 4.14$, $M_{2nd} = 3.94$; $t(71) = 1.08$, NS; see fig. 2).

We have proposed that advertisements disrupt adaptation and consequently increase the enjoyment of the TV program following the disruption. Clearly, this argument does not uniquely apply to advertisements—any interruption has the potential to disrupt adaptation and intensify the experience. The fourth study tested this conjecture by combining two short documentaries so that they either played continuously or so that they disrupted each other. We predicted that the disrupted experience would be more enjoyable than the continuous one.

FIGURE 2

STUDY 3—RETROSPECTIVE ENJOYMENT OF THE FIRST AND SECOND HALF OF THE DOCUMENTARY AS A FUNCTION OF THE PRESENCE OF DISRUPTIVE COMMERCIALS



STUDY 4

Method

Two hundred fifty-six undergraduate students participated for either $8 or partial fulfillment of a course requirement. Participants were randomly assigned to one of four conditions in a 2 (perspective: forecasters vs. experiencers) × 2 (disruption: continuous vs. disrupted) factorial design. Similar to study 3, all participants first watched and rated the 15-second grizzly bear clip and additionally reported how much they enjoyed nature in general. Next, the experiencers watched two 3-minute nature documentaries (one about bison and one about deserts). Approximately half of the experiencers watched the two documentaries in succession (continuous condition), while the other half watched the first half of each documentary, followed by the second half of each documentary (disrupted condition). Order was counterbalanced and did not influence any of the dependent measures. After watching both videos, participants evaluated their overall experience on a 9-point scale and subsequently reported their enjoyment of the first and second half of the experience. The remainder of the participants, the forecasters, read about the experience and predicted the responses of the experiencers in one of the two disruption conditions.

Results and Discussion

All analyses controlled for enjoyment of the grizzly bear clip and self-reported enjoyment of nature. Whereas advertisements are universally believed to detract from viewing experiences, we were more agnostic about forecasters' predictions in this experiment. Indeed, although forecasters tended to believe the experience would be better in the continuous condition than in the disrupted condition, this difference was not reliable ($M = 4.90$ vs. 4.67; $F(1, 120) = 1.20$, NS). However, experiencers enjoyed the experience significantly more in the disrupted condition than in the continuous condition ($M = 5.20$ vs. 4.62; $F(1, 128) = 4.27$, $p = .041$), resulting in a reliable interaction of perspective and disruption ($F(1, 250) = 5.47$, $p = .020$; see fig. 3).

Additional measures suggest that the disruption interfered with adaptation. Experiencers who watched the videos consecutively enjoyed the second half marginally less than the first ($M_{1st} = 5.28$, $M_{2nd} = 4.48$; $F(1, 64) = 3.56$, $p = .064$), whereas people who watched the disrupted videos enjoyed the second half about as much as the first half ($M_{1st} = 5.28$, $M_{2nd} = 5.41$; $F(1, 62) < 1$, NS), resulting in a reliable interaction of time and disruption ($F(1, 128) = 4.03$, $p = .047$). Consistent with previous research, forecasters did not predict the effect of adaptation, nor did they predict the moderating role of the disruption (see fig. 4).

STUDY 5

Although interrupting the television program increased participants' enjoyment of the program in each of the four preceding studies, it is unlikely that this effect is universal. If, as hypothesized, interruptions increase enjoyment by disrupting adaptation, then commercial interruptions will only have a positive impact if consumers are in fact adapting to the program. Thus, the beneficial effect of commercial interruptions should be reduced (1) for consumers who are slower to adapt and (2) for shows that consumers are less likely to adapt to. In the last two studies, we examine both boundary conditions.

First, we studied the effect of individual differences in the tendency to adapt, using consumer age as a proxy variable. Although there is little research on individual differences in adaptation, age has been shown to have consequences that are highly relevant for adaptation. In particular,

FIGURE 3

STUDY 4—FORECASTED AND EXPERIENCED ENJOYMENT AS A FUNCTION OF DISRUPTION

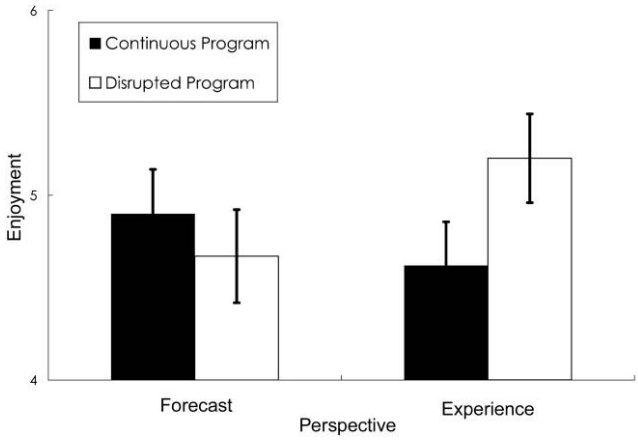
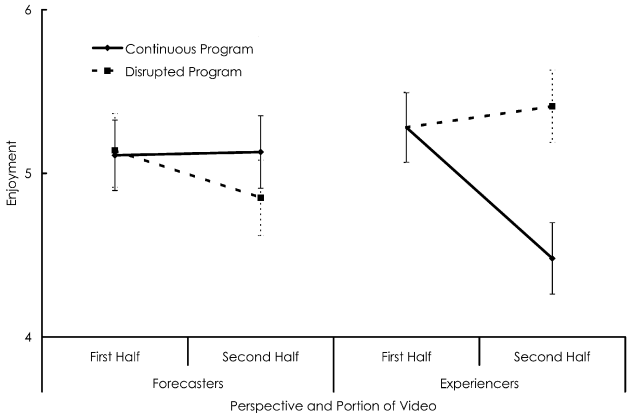


FIGURE 4

STUDY 4—FORECASTED AND EXPERIENCED ENJOYMENT RATINGS OF THE FIRST AND SECOND HALVES OF THE DOCUMENTARY EXPERIENCE



previous research found that as age increases, consumers' need for stimulation tends to decrease (Kish and Busse 1968; Raju 1980). Since novelty is one of the principal drivers of stimulation (Hebb 1955), this finding indicates that older consumers are more likely to enjoy the same experience without requiring additional stimulation from constant changes. Stated differently, previous research suggests that older consumers should show less adaptation to an ongoing television program. It should follow then that, as consumers age, there should be a corresponding reduction in the potential benefits of commercial disruptions. To test this prediction, study 5 conceptually replicated study 2 using a participant sample with a much wider age distribution than in the preceding studies.

Method

One hundred and seven participants in an online panel completed this study in exchange for entry into a lottery for $50. The study was a conceptual replication of study 2 with two substantive differences. First, rather than completing the study in the lab, participants completed the study on their own via the Internet. This allowed us to collect data from consumers with a wide range of ages. Second, instead of including a commercial that was intentionally at least as enjoyable as the video, we included a commercial that was less enjoyable than the main program (the same Hyundai Challenge commercial used in study 3). Since the latter is the more common situation, this study was a stronger test of the external validity of the effect.

Otherwise, the design was identical to that of study 2. Participants first watched and rated the 25-second training video (to provide a baseline measure for their liking of animated videos) and then watched the sword fight video, either without interruption or with the commercial inserted into the middle of the clip. Finally, participants indicated how much they enjoyed the sword fight video (1 = did not enjoy it at all; 9 = enjoyed it very much), how entertaining the video was (1 = not entertaining; 9 = very entertaining), and how much they would be willing to pay for a DVD compilation of videos created by the same director (using the same measure as in study 2). They were then thanked and debriefed.

Results

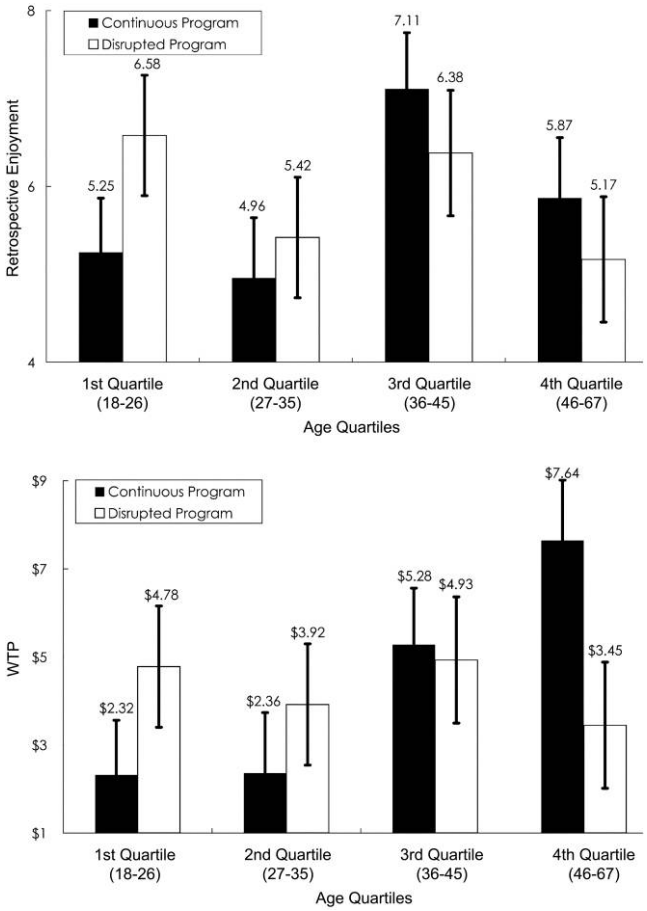
Unlike in our previous studies, the sample in study 5 was not biased toward college-aged participants. The age range of our participants was 18–67, with a median age of 35, similar to the median age of the U.S. population of 35.3 (U.S. Census Bureau 2000). Effects varied continuously across the age range, but for rhetorical simplicity we simply split our sample along the median age so that we compared consumers age 35 and younger to consumers age 36 and older. We obtain similar results if we split the sample at a different age point or categorize participants more minutely (as seen in fig. 5).

Our two primary dependent measures, enjoyment of the clip and level of entertainment, were highly correlated ($r = .96$) and thus were pooled into a single retrospective enjoyment measure. Confirming our hypothesis, a 2 (commercial: present vs. absent) × 2 (age: younger vs. older) ANCOVA on retrospective enjoyment (with the enjoyment ratings of the initial clip as a covariate) revealed a marginally reliable interaction ($F(1, 102) = 3.33$, $p = .071$) such that younger participants liked the clip more when the commercial was present ($M_{dis} = 6.2$, $M_{cont} = 5.2$), whereas older participants liked the clip more when the commercial was absent ($M_{dis} = 5.7$, $M_{cont} = 6.4$). An ANCOVA on participants' willingness to pay for a DVD again revealed a similar interaction ($F(1, 102) = 5.40$, $p = .022$): younger participants were willing to pay more for the DVD when the commercial was present ($M_{dis} = \$4.59$, $M_{cont} = \$2.36$), whereas older participants were willing to pay more when the commercial was absent ($M_{dis} = \$4.08$, $M_{cont} = \$6.30$). Figure 5 illustrates how these effects play out over the age range. It is worth noting that these effects are not simply due to age differences on the enjoyment of the commercial since older participants actually liked the commercial slightly more than did younger participants ($M = 3.96$ vs. 2.81; $t(48) = 1.89$, $p = .065$).

In addition to the retrospective measures discussed above, we had also asked participants to continuously report their enjoyment while watching both videos (on a 101-point slider scale anchored by "not at all enjoying it" and "very much enjoying it"), based on the assumption that the slope of this measure would indicate the operation of adaptation or sensitization. Indeed, as expected, when we considered the slope of the second half of the experience (i.e., after the commercial), we found that the effect of the disruption on adaptation was moderated by age ($F(1, 102) = 3.77$, $p = .055$). Without commercial interruption, younger participants showed marginally more adaptation than older participants ($M_{slope_{yng}} = -0.10$, $M_{slope_{old}} = 0.23$; $F(1, 102) = 3.39$, $p = .069$), and this difference disappeared after a com-

FIGURE 5

STUDY 5—ENJOYMENT MEASURES AS A FUNCTION OF AGE AND DISRUPTION



NOTE.—The top panel depicts retrospective enjoyment of continuous and disrupted programs, and the bottom panel depicts a related measure of willingness to pay for a DVD compilation of work by the director of the video. Both charts show that the advantage for the disrupted program is reduced and reversed with increasing participant age.

mercial interruption ($M_{\text{slope}_{\text{yng}}} = 0.43$, $M_{\text{slope}_{\text{old}}} = 0.25$; $F < 1$, NS). Nevertheless, substantial oscillation in the continuous ratings made it difficult to draw any inferences about adaptation or sensitization. In hindsight, this continuously adjustable scale was overly sensitive to moment-to-moment changes in the video. Therefore, rather than overinterpreting these results, we sought to remedy the problem by using a substantially improved measure in the next study.

In addition to using more precise measures to clarify the role of adaptation, study 6 also examined a different boundary condition of the effect. Whereas study 5 indicated that the effect of disruptions is moderated by variation in consumers' tendency to adapt, study 6 tested whether the effect is also moderated by variation in the show's tendency to elicit adaptation.

STUDY 6

The first objective of study 6 was to compare the effect of commercial interruptions for two similar programs that varied in the extent to which consumers tend to adapt to them. If commercial interruptions indeed improve shows by disrupting adaptation, then commercials should have less impact on shows that people are less likely to adapt to. The second objective of the study was to collect real-time evidence of adaptation. Accordingly, participants occasionally reported their enjoyment while watching the program. We predicted that enjoyment ratings would decrease over time when the adaptation-eliciting program was shown without interruption but that this decreasing trend would be reduced or eliminated when commercials were inserted.

We first needed to identify novel, but likeable, video programs that varied in the extent to which consumers adapted. We selected musical dance segments taken from Bollywood musicals since these were readily available yet mostly unfamiliar to our participants. Furthermore, although sharing many features (i.e., Indian music and actors), they vary sufficiently in content and execution to plausibly elicit different levels of adaptation. We first identified six representative videos that varied in pace and level of activity and, in a pretest, had participants watch and continuously evaluate each one. From the pretest we identified two videos for the main study.

Pretest

An online panel of 77 participants (ages 18–35) completed the pretest in exchange for entry into a $50 lottery. Seven participants did not follow instructions for the online measures (they did not provide any ratings) and were omitted from all further analyses.

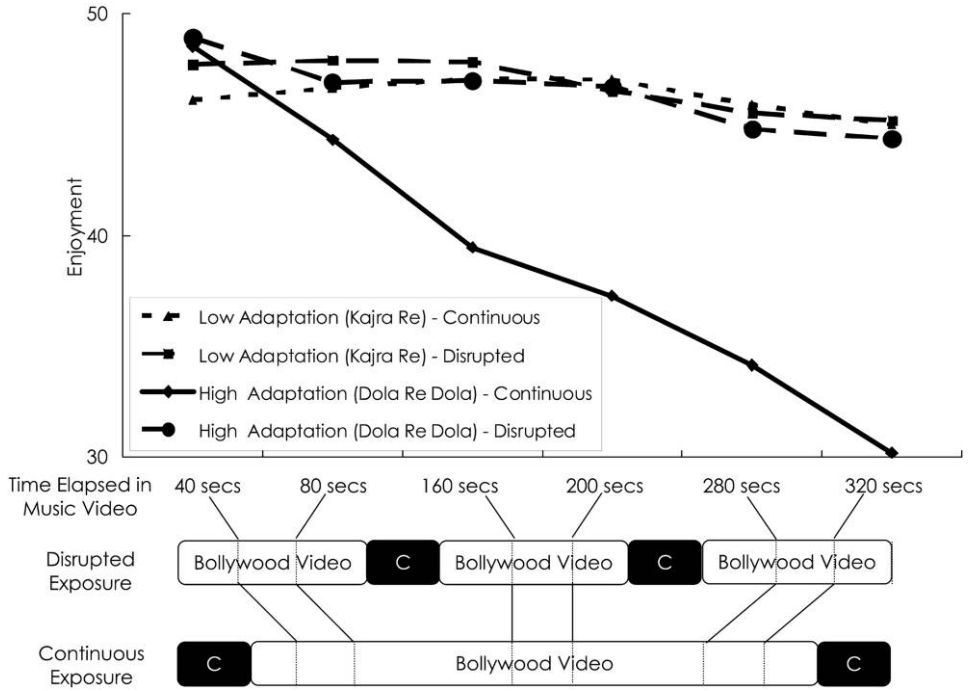
Participants were asked to watch and rate one of six Bollywood music videos (movies in parentheses): *Dola Re Dola* (*Devdas*), *Touch Me* (*Dhoom 2*), *Maiya Maiya* (*Guru*), *Tera Chera* (*Jodha Aakbar*), *Bachan* (*Kuch Na Kuch*), and *Kajra Re* (*Bunty Aur Babli*). The length of each video was approximately 6 minutes. To measure adaptation rate, participants provided real-time ratings of their current enjoyment on an unmarked slider scale (anchored by "I love it" and "I hate it"). Every 30 seconds, the scale appeared on the screen next to the video and then disappeared after participants indicated their enjoyment. Furthermore, in order to make participants aware of their previous ratings, the bottom half of the screen contained a graph of all previous ratings (see the appendix for a screen shot).

Before evaluating the target video, participants were trained to use the rating scale. All participants first watched a short (4 minute) animated video (the Pixar short film *Boundin'*) and rated their enjoyment of it following the procedure outlined above. They were then randomly assigned to watch and evaluate one of the six videos.

We collected the online ratings from each participant and computed the relationship between timing (in seconds) and evaluation (on the 101-point scale). The slope of this func-

FIGURE 6

STUDY 6—ONLINE BOLLYWOOD EVALUATIONS AS A FUNCTION OF TIME, VIDEO, AND EXPERIENCE



NOTE.—Disruptions mitigated adaptation to the high adaptation video but had no reliable effect for the low adaptation video.

tion indicated the extent to which participants were showing adaptation (a negative slope) or sensitization (a positive slope). We chose the video segment with the steepest slope (*Dola Re Dola*; slope = −1.01) and the shallowest slope (*Kajra Re*; slope = −0.13) for inclusion in the final study. The low adaptation video (*Kajra Re*) involved a fast-paced, dynamic dance sequence with two male actors, Abhishek Bachchan and Amitabh Bachchan, attempting to win over the lead female actress, Aishwarya Rai. In contrast, the high adaptation video (*Dola Re Dola*) showed a large group of female dancers in a well-choreographed but less tumultuous dance sequence.

Main Experiment

Participants ($n = 112$; ages 18–35) from an online panel completed the experiment in exchange for entry into a lottery for $100. They were randomly assigned to one of four conditions in a 2 (video: high adaptation vs. low adaptation) × 2 (disruption: continuous vs. disrupted) factorial design. Fourteen participants failed to follow the instructions for the online evaluations (they did not provide any ratings) and were excluded from the analysis.

The procedure was similar to the pretest (after the short animated clip, each participant watched and rated a Bollywood musical video), but there were a few critical changes. Participants were randomly assigned to watch either the high adaptation video (*Dola Re Dola*) or the low adaptation video (*Kajra Re*). For all participants, these videos contained two 30-second commercials (both from study 1: Jewelry Factory Store and the Law Office of Michael Brownstein), but the placement of the ads depended on the disruption condition (similar to study 3). In the continuous condition, the commercials immediately preceded and followed the target video, whereas in the disrupted condition, they were placed 2 and 4 minutes into the video. In this way, all participants were exposed to the same commercials, but only for some participants did the commercials disrupt the Bollywood video. The order of the two commercials was counterbalanced.

All participants provided online ratings at six different points within each film (matched across conditions so that all participants provided ratings at the same moment in the video, as illustrated at the bottom of fig. 6). When the video ended, all participants rated the video on a 9-point scale (1 = hated it; 9 = loved it).

Results

We first examined the retrospective enjoyment measures. As predicted, for participants watching the high adaptation video, those in the disrupted condition enjoyed the clip more than did those in the continuous condition ($M = 5.35$ and 3.41; $F(1, 94) = 7.99$, $p = .006$), but there was no similar

effect for participants watching the low adaptation video ($M = 5.15$ and 5.38; $F < 1$), resulting in a reliable video by disruption interaction ($F(1, 94) = 5.07, p = .027$). Consistent with the proposed disruption of adaptation account, interruptions only improve a video program when that program leads to adaptation. If a program does not lead to adaptation, then interruptions lose their utility.

To further test the disruption of adaptation account, we examined the responses collected during the ongoing experience, which are summarized in figure 6. We first coarsely analyzed the online measures with a mixed design 2 (video: low adaptation, high adaptation) × 2 (disruption: continuous, disrupted) × 6 (iteration) ANOVA, revealing a main effect of iteration ($F(5, 470) = 8.10, p < .001$) and the important three-way interaction ($F(5, 470) = 2.92, p = .013$). To decompose these effects, we computed the relationship between time and enjoyment and analyzed how the slope of that function was influenced by the two between-subjects manipulations. As predicted, this analysis revealed a reliable interaction of video and disruption ($F(1, 94) = 5.26$, $p = .024$). For people watching the high adaptation video, adaptation to the video was reduced when it was interrupted by commercials, as reflected in a significant reduction in the negativity of the slope ($M_{\text{slope}_{\text{dis}}} = -0.84$, $M_{\text{slope}_{\text{cont}}} = -3.56$; $F(1, 85) = 7.92, p = .006$). In contrast, for people watching the low adaptation video, the presence or absence of commercial disruptions had no influence on the relationship between time and enjoyment ($M_{\text{slope}_{\text{dis}}} = -0.60$, $M_{\text{slope}_{\text{cont}}} = -0.23$; $F < 1$). In fact, the only slope that reliably differed from zero was that of the high adaptation, continuous condition ($t(21) = 5.54$, $p < .001$).

In addition, we investigated whether the adaptation slope mediated the influence of our manipulations on retrospective enjoyment. Following the procedure outlined by Baron and Kenny (1986), we first replicated the analysis showing a reliable effect of the video × disruption interaction on retrospective enjoyment ($t(94) = 2.25$, $p = .027$) and on the adaptation slope ($t(94) = 2.29$, $p = .024$). Second, we observe that the adaptation slope reliably affects retrospective enjoyment ($t(94) = 4.76$, $p < .001$). Finally, when retrospective enjoyment is simultaneously regressed on the independent variables, their interaction, and the mediator, the interaction variable drops to nonsignificance ($t(94) = 1.47$, $p = .14$), but the mediator remains reliable ($t(94) = 3.79$, $p < .001$). A subsequent Sobel (1982) test confirmed that the drop in the interaction effect was reliable ($z = 1.96$, $p = .049$).

Furthermore, although the video × disruption interaction influenced the slope of the ratings, it did not reliably influence the final rating ($t(94) = 1.22$, NS), and the effect of the interaction on retrospective enjoyment remained significant when controlling for the final rating ($t(94) = 2.11$, $p = .037$). Thus, the commercial interruptions differentially affected participants' retrospective enjoyment of the two videos by changing the rate of adaptation, not by changing the end of the experience.

GENERAL DISCUSSION

Although people prefer to avoid disruptions in television programming, we observe that disruptions can actually improve the viewing experience. People often adapt to the experience of watching television such that each successive minute is slightly less enjoyable than the previous one. Advertisements, although independently aversive, disrupt this adaptation process and can therefore make the overall experience more enjoyable. We first observed that a 30-minute situation comedy was enjoyed less when the commercials were edited out (study 1). This effect was not due to contrast effects between the program and the advertisement (study 2) nor to the mere availability of commercials for comparison (study 3) and in fact extended to nonadvertising disruptions as well (study 4). Furthermore, people reported experiencing adaptation when television programs were shown continuously but not when the programs had been disrupted (studies 3 and 4). Finally, the effect is restricted to consumers who adapt to the show (study 5) and to shows that consumers adapt to (study 6).

Although these last two studies, and in particular the online measures collected in study 6, clearly demonstrate that the commercial interruptions improved the programs by disrupting adaptation, this is certainly not the only way in which they can favorably influence programs. For example, a disruption in a suspenseful plotline might heighten anticipation and intensify its subsequent resolution (Loewenstein 1987). Similarly, commercials may offer opportunities to elaborate on what viewers have watched so far or to savor what is still to come. For instance, participants in the disrupted conditions may have actively anticipated the continuation of the documentary or the music video while watching the commercials. Furthermore, if the commercials themselves are very pleasant or exciting, the show in which they are embedded may benefit from the residual affect or arousal, as suggested by Finn and Hickson (1986).

If, as these studies demonstrate, commercial interruptions can improve the viewing experience, then why have people not learned the beneficial effect of these interruptions? Moreover, why are people so reluctant to disrupt a positive experience when they often seek to segregate them (Linville and Fischer 1991)—even when they should not (Morewedge et al. 2007)? Some forecasting errors may be partially explained by the rarity of the particular circumstances. For example, the assistant professor who overestimates the affective impact of a negative tenure decision (Gilbert et al. 1998) might be forgiven for a general ignorance of this specific situation and, thus, an increased reliance on an (incorrect) intuitive theory. If this explanation indeed holds, then repeated affective experiences should be more accurately predicted. Yet, given that our participants had a surplus of experience watching television with and without commercials, it is interesting to note that they still failed to predict the influence of advertising disruptions. Why have they not learned?

One possible reason is that people do not evaluate their experiences with the relevant comparisons in mind. In order

to learn about the positive effects of advertisements, people need to consider the same program with and without commercials. Inevitably, this is almost impossible; after watching an episode of *Taxi*, people are unlikely to immediately rewatch the same episode, this time adding or omitting the advertisements. In essence, experiences are all collected in the form of separate evaluations, whereas our viewing decisions are made based on hypothetical joint evaluations (Hsee et al. 1999).

Furthermore, in prospect, people focus on their aversion to advertisements but ignore the influence of advertisements on their experience of the program. As has been shown with other positive life experiences, people predict and recollect experiences in terms of their imperfect expectations and often independent of their actual experience (e.g., Wirtz et al. 2003). As such, after having watched a show with commercial interruptions, consumers may rely on their lay beliefs and later recall that experience as aversive, which in turn will lead them to expect more aversive reactions to commercial interruptions in the future.

Finally, consumers' inability to discern the beneficial effects of commercial interruptions may be partially due to the fact that these beneficial effects are far from universal—resulting in a noisy signal that impedes learning. As we mentioned at the outset of this article, whether a commercial interruption increases the enjoyment of the program depends on both the nature of the interruption and the nature of the program.

First, despite disrupting adaptation, commercial interruptions may decrease consumers' enjoyment of the show if they elicit strong negative affect (e.g., heart-wrenching charity appeals), are incongruent with the mood created by the program (e.g., a humorous commercial interrupting a drama), or are simply overly tedious. The last is most likely if the interruption consists of a large blocks of commercials. In fact, since our studies demonstrate that short commercial interruptions are sufficient to disrupt adaptation, it follows that increasing the duration of the commercial interruption will increase consumers' annoyance at the disruption without further enhancing the benefits derived from disrupting adaptation. Furthermore, although consumers may have a surprising ability to remain absorbed in a television program in spite of repeated interruptions, this ability may be strained if the interruptions become too long or too frequent. Thus, there is likely to be an ideal number and pattern of commercial interruptions so as to maximize disruption of adaptation while preserving engagement and minimizing consumer irritation.

Second, while it is unlikely that all types of commercial interruptions will improve the programs in which they are embedded, it is equally unlikely that all types of programs will be improved by interruptions. As study 6 demonstrates, programs that differ in their tendency to engender adaptation also differ in the extent to which they benefit from commercial interruptions. However, the difference in tendency to elicit adaptation was identified empirically (based on a pretest) rather than conceptually. Thus, while study 6 is very helpful in clarifying the underlying mechanism, it contributes little to isolating the specific characteristics of a program that determine whether people will adapt to it (and thus whether it will benefit from commercial interruptions). This leaves us with the question as to which types of programs people are less likely to adapt to—and how common are those programs?

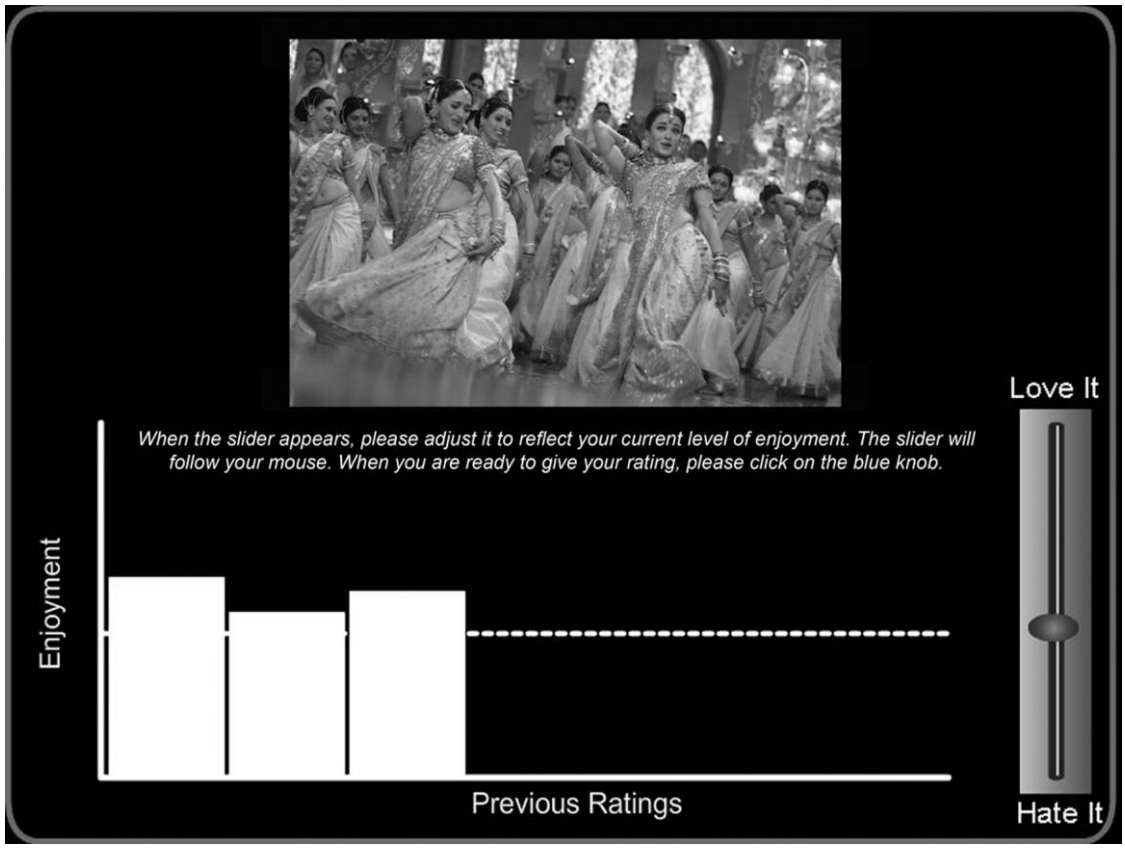
Popular television may, in fact, have evolved to maximize experience by minimizing adaptation. For example, it has been argued that television programming has grown more complex, with precisely the types of jarring editing and elaborate writing that keep people from adapting to a program (Johnson 2005). It is perhaps also at these extremes of complexity that the prescriptions for advertising shift. Whereas the relative monotony of a pleasant bison documentary might benefit from the occasional disruption, the more elaborately compiled contemporary programming might sufficiently mitigate adaptation so that additional disruptions would lose their positive utility and even add negative utility. The monotony of everyday life may particularly benefit from disruption, but perhaps the exotic polytony of contemporary fiction requires fewer disruptions to remain enjoyable.

In view of these boundary conditions, to what extent do our results extend to existing consumer experiences? Clearly, there are some important differences between the experiences of our participants and those of the average television viewer. The videos shown to our participants were less complex than many modern television shows and, with the exception of study 1, also substantially shorter than these shows. While both differences have important implications for the likelihood of adaptation, their net effect is likely to be mixed: whereas greater complexity would reduce adaptation, longer duration would actually increase it. In addition, some new media formats in fact do mirror the stimuli presented to our participants. For instance, popular online media providers such as Hulu.com provide short clips, including animations and music videos, with 30-second commercials. Interestingly, the most common method of presenting these commercials is before starting the actual clip. However, our results indicate that moving the commercial to the middle of the clip—while not intuitively appealing to viewers—would actually increase their enjoyment of the experience.

APPENDIX

FIGURE A1

SCREEN SHOT OF THE INEXPERIENCE ELICITATION MEASURE USED IN STUDY 6



NOTE.—The rating scale only appeared at the predetermined intervals in order to allow for minimal distraction from the video. In addition to the appearance of the scale, the background color of the screen changed to gray to highlight the fact that an evaluation was being elicited. Color version available as an online enhancement.

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