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Do Sex and Violence Sell? A Meta-Analytic Review of the Effects of Sexual and Violent Media and Ad Content on Memory, Attitudes, and Buying Intentions

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It is commonly assumed that sex and violence sell. However, we predicted that sex and violence would have the opposite effect. We based our predictions on the evolution and emotional arousal theoretical framework, which states that people are evolutionarily predisposed to attend to emotionally arousing cues such as sex and violence. Thus, sexual and violent cues demand more cognitive resources than nonsexual and nonviolent cues. Using this framework, we meta-analyzed the effects of sexual media, violent media, sexual ads, and violent ads on the advertising outcomes of brand memory, brand attitudes, and buying intentions. The meta-analysis included 53 experiments involving 8,489 participants. Analyses found that brands advertised in violent media content were remembered less often, evaluated less favorably, and less likely to be purchased than brands advertised in nonviolent, nonsexual media. Brands advertised using sexual ads were evaluated less favorably than brands advertised using nonviolent, nonsexual ads. There were no significant effects of sexual media on memory or buying intentions. There were no significant effects of sexual or violent ads on memory or buying intentions. As intensity of sexual ad content increased, memory, attitudes, and buying intentions decreased. When media content and ad content were congruent (e.g., violent ad in a violent program), memory improved and buying intentions increased. Violence and sex never helped and often hurt ad effectiveness. These results support the evolution and emotional arousal framework. Thus, advertisers should consider the effects of media content, ad content, content intensity, and congruity to design and place more effective ads.

Keywords: sexual media, violent media, advertising, meta-analysis, brand

> Ninety-eight percent of American homes have TV sets, which means the people in the other 2% have to generate their own sex and violence.
>
> —Gene Baylos, Comedian (1906–2005)

There is plenty of sex and violence on TV. Indeed, well over half of TV programs contain sex, violence, or both (Federman, 1998; Kunkel, Eyal, Finnerty, Biely, & Donnerstein, 2005; Lyons, 2013).[1] However, TV is not the only form of media with lots of sex and violence. There is also plenty of sex and violence in movies (Gunasekera, Chapman, & Campbell, 2005; Yokota & Thompson, 2000) and video games (e.g., Dill, Gentile, Richter, & Dill, 2005).

Regardless of the extent to which violent and sexual content have negative effects on society, the prevalence of violent and sexual media content merits consideration on its own. We are interested in why producers create large quantities of violent and sexual content, and whether their reasoning is justified. The simplest answer to this question is that advertisers think sex and violence sell, so they buy advertising time during sexual and violent programs, and in turn producers continue to create sexual and violent programs that attract advertising revenue. As former CBS and NBC programming president Jeff Sagansky said, "The number one priority in television is not to transmit quality programming to viewers, but to deliver consumers to advertisers. We aren't going to get rid of violence until we get rid of advertisers" (Kim, 1994, p. 1434).

Advertisers frequently sponsor media containing violence and sex, perhaps because they believe such media draw larger audiences. There is some accuracy to that belief. Among the 100 highest-rated TV programs, 100 top-grossing films, and 50 top-selling video games

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[1] These are the most current statistics available as of 2014. The primary funding agency for TV content analyses, the Henry J. Kaiser Family Foundation, has drastically reduced financial support for media research in recent years (Littleton, 2013). As a result, whereas there used to be frequent content analyses regarding both of these topics (see Federman, 1997, 1998; Kunkel et al., 1999, 2003, 2005, 2007; Kunkel, Cope-Farrar, Biely, Farinola, & Donnerstein, 2001; Seawell, 1996) there is now a dearth (see also Strasburger, Jordan, & Donnerstein, 2012).

from 2009 through 2014, 48% were specifically rated for violent content and 28% were specifically rated for sexual content (TV-14 [ages 14+] or TV-MA [ages 17+] for TV; PG-13 [ages 13+] or R [ages 17+] for films; and T [ages 13+] or M [ages 14+] for video games; see Appendix A for further details).

Furthermore, among the 25 most expensive programs to purchase ads in during the 2014–2015 season, 44% were rated TV-14 or TV-MA for violence, and 40% were rated TV-14 or TV-MA for sex (Poggi, 2014). Likewise, a recent analysis showed that among the 30 top grossing films each year, the amount of gun violence in PG-13 films has more than tripled since 1985, when the rating was introduced (Bushman, Jamieson, Weitz, & Romer, 2013).

Overall, these percentages suggest that almost half of the most popular shows, films, and games contain violence, and more than a quarter contain sex. Therefore, insofar as a larger audience leads to more exposure for the product and thus more potential customers, advertising in violent and sexual media may provide advertisers the exposure they seek.

Also important to advertisers is the fact that among adults, the age group most drawn to media containing violence and sex is 18- to 34-year-olds (Hamilton, 1998). This is also the age group with the most disposable income (Hamilton, 1998). In addition, many advertisers believe that younger adults are more easily influenced by commercials than are older adults who have more established purchasing habits (Hamilton, 1998). Therefore, violent and sexual media appeal to a key marketing demographic in addition to drawing large audiences.

Conventional wisdom holds that because programs with larger audiences reach more potential consumers, advertising in popular programs is effective. This assumption is correct if reach is the metric by which effectiveness is measured. However, return on investment (ROI) is actually more important than reach to advertisers who want to get the best value for their ad purchases (Bohnsack, 2013). Advertising ROI is the ratio of net profit to advertising costs (Google, n.d.). Insofar as it costs more to advertise in popular programs, ads in popular programs need to yield corresponding increases in sales to achieve successful ROI. In other words, ads that reach many consumers but do not influence purchasing behavior or brand loyalty are not effective in terms of ROI because there are no results to show for the expensive ad placement other than the fact that many people saw the ad.

In fact, research suggests that large audiences do not necessarily yield the best ROI, at least in terms of proxy measures used when actual profit data are unavailable. For example, the Super Bowl draws the largest audience for any televised event—it had 111.5 million viewers in 2014 (Nielsen, 2014). The Super Bowl is also the most expensive TV program to advertise in (Poggi, 2014; Steinberg, 2014). However, in a study of more than 1,000 consumers, 80% of Super Bowl advertisements in 2012 and 2013 did not increase purchase intentions or purchase behaviors, compared with only 60% of non-Super Bowl advertisements (Neff, 2014). Likewise, consumers who remembered seeing a Super Bowl advertisement recalled the brand only 35% of the time, compared with 50% for those who remembered seeing non-Super Bowl advertisements.

Another study confirmed these findings. Advertisers in the United Kingdom spent 10% more (on average) during large sporting events in the early 2000s (e.g., 2002 Winter Olympics and 2002 FIFA World Cup), but advertising effectiveness decreased 2 weeks before, during, and 2 weeks after the events (Gijsenberg, 2014). More specifically, advertising elasticities (i.e., percentage increase in sales per 1% increase in advertising expenditure) decreased for products advertised during the events by more than 50%. The author suggested that competition between advertisers and the emotional excitement of the events interfered with memory for advertised brands, even outweighing the positive effects of inherently larger audiences.

These conclusions can be extended to the effects of violent and sexual content on advertising. Although violent and sexual media often attract large audiences, advertising in those programs is less effective than advertising in programs without violent and sexual content. Studies across film, TV, and video games suggest that advertising in violent or sexual programs and advertising with violent or sexual advertisements are both ineffective marketing strategies. Outcomes of these strategies include impaired memory for brands advertised during violent and/or sexual TV programs (Bushman, 2005), less favorable attitudes toward brands advertised in violent video games (Yoo & Peña, 2011), and even declines in stock performance for brands placed in violent films (Wiles & Danielova, 2009).

This meta-analytic review updates and extends a previous meta-analysis that found violence in TV programs impairs memory for advertised brands (Bushman & Phillips, 2001). We sought to replicate the effects of that previous meta-analysis while including the large sample of relevant studies published since 2001 (19 additional research reports). Additionally, we sought to examine the effects of advertisements embedded in sexual media content, and the effects of advertisements that feature violent and sexual content themselves.

Including sex in this review serves two important purposes. First, our theoretical framework based in evolutionary theory proposes that people are "hard-wired" to attend to violent and sexual cues because violent and sexual cues are associated with survival and reproduction. Whereas violent cues are more relevant to survival, sexual cues are more relevant to reproduction. Including sexual media and ads in this review allows us to test our theoretical framework more thoroughly. Second, there are many studies that examine sex in advertising, which allows us to determine whether our framework extends from programs containing violence and/or sex to ads containing violence and/or sex.

We also examined brand attitudes and buying intentions as outcome measures of advertising effectiveness in addition to brand memory (that was examined in the Bushman and Phillips (2001) meta-analysis).[2] These dependent variables represent several key ones involved in processing advertising. For example, one model outlined eight stages of processing advertising: (1) exposure to advertisement, (2) pay attention to it, (3) comprehend the advertising message, (4) evaluate it favorably or unfavorably, (5) encode the message into long-term memory, (6) retrieve the information at a later time, (7) decide among the available options such as what

[2] Researchers typically measure advertising effectiveness from two perspectives. Field research measures effectiveness with market responses, such as advertising elasticity, wear-in/wear-out, and frequency of ad exposure (Tellis, 2009). Behavioral research measures effectiveness with mental responses such as memory for advertised brands, attitudes toward advertised brands, and intentions to purchase advertised brands (Tellis, 2009). This review measures advertising effectiveness from the behavioral perspective.

brand to purchase, and (8) buy or not buy the advertised product (Shimp & Gresham, 1983). This meta-analytic review examines the important latter stages of this model, including brand attitudes (Stage 4), brand memory (Stages 5 and 6), and buying intentions (Stage 7). We were forced to restrict our analyses to explicit measures of memory, attitudes, and intentions because very few studies have included implicit measures.

Theoretically, the second stage of the model—paying attention to the advertisement—might be the most important one in understanding advertising effectiveness. We offer a theoretical explanation of why violence and sex might influence brand memory, brand attitudes, and buying intentions. Our underlying thesis is that evolution predisposes individuals to pay attention to emotionally arousing cues, including violent and sexual cues. We describe the theoretical foundation for our review in the next section.

Next, we describe several key moderator variables that we tested in our review. These include how graphic the violence and sex are, whether the media content matches the ad content, year of publication, and participant gender and age.

Theoretical Foundation for Meta-Analytic Review

Based on evolutionary theory, we propose that people are hard-wired to pay attention to violent and sexual cues (Buss & Duntley, 2006; Maner, Gailliot, Rouby, & Miller, 2007). Proponents of evolutionary theory argue that attention is selective because the mind evolved from an environment in which particular attention to potential threats to safety and potential opportunities for mating afforded survival and reproduction advantages (Neuberg, Kenrick, & Schaller, 2010). Our evolutionary ancestors who paid attention to violent cues were less likely to be killed by enemies or predators (Neuberg et al., 2010). Our evolutionary ancestors who paid attention to sexual cues were more likely to reproduce (Neuberg, Kenrick, Maner, & Schaller, 2004). In other words, evolutionary ancestors who were more likely to attend to threats to safety and opportunities for mating were more likely to survive and pass on their genes than their counterparts who were less likely to attend to those cues. As a result, attention evolved to favor stimuli associated with danger and reproduction, such as violence and sex (Nairne, 2010).

There is empirical evidence supporting these propositions of evolutionary theory. People attend to threatening faces quicker and remember them more accurately than friendly faces (Öhman, Lundqvist, & Esteves, 2001). Heterosexual people also attend to attractive members of the opposite sex quicker and remember them more accurately than less attractive members of the opposite sex (Maner et al., 2007). More important, these attentional biases are especially pronounced among populations for whom survival and reproduction are more salient, lending support to an evolutionary interpretation. For example, threat and danger are more salient for socially anxious people (Mathews, 1990). In one experiment, for example, socially anxious participants responded to stimuli in spatial locations previously occupied by threatening faces faster than less socially anxious participants (Mogg & Bradley, 2002). Likewise, reproduction is more salient for people seeking mating opportunities or sensing threats to reproductive success. In one experiment, for example, participants primed with sexual cues, participants primed with relationship jealousy cues, and sexually unrestricted participants all demonstrated greater attentional bias toward attractive opposite sex targets than their counterparts for whom reproductive goals were less salient (Maner et al., 2007). Taken together, these studies provide empirical evidence for the hypothesis that people are hard-wired to pay attention to violent and sexual cues.

A byproduct of evolutionary attention to violent and sexual cues is that these cues are emotionally arousing (Neuberg et al., 2010). Many studies confirm that arousing violent and sexual cues attract attention, often at the expense of surrounding cues that are less arousing (e.g., Geer, Judice, & Jackson, 1994; Geer & Melton, 1997; Loftus & Burns, 1982; Loftus, Loftus, & Messo, 1987). For example, weapon focus studies have found that the presence of a weapon during a crime causes observers to fixate on the weapon rather than on the perpetrator, and in turn observers remember features of the perpetrator less accurately than when no weapon is present (for a meta-analysis see Steblay, 1992). Emotional arousal narrows attention (Easterbrook, 1959), which is the second crucial step in the processing model of advertising effectiveness (Shimp & Gresham, 1983).

Neuroscience evidence also suggests that violent and sexual stimuli have attentional priority because of their arousal capacity. Increased activity in limbic structures such as the amygdala and hypothalamus has been associated with viewing violence (Cahill et al., 1996; Garavan, Pendergrass, Ross, Stein, & Risinger, 2001) and sex (Beauregard, Lévesque, & Bourgouin, 2001; Karama et al., 2002). Related research suggests that the amygdala plays a crucial role encoding emotionally arousing stimuli in memory more strongly relative to neutral stimuli (Cahill et al., 1996; Dolcos & Cabeza, 2002; Hamann, Ely, Grafton, & Kilts, 1999; LaBar & Cabeza, 2006). Therefore, there is further support for implementing the evolution and emotional arousal framework in the context of violent and/or sexual advertising effects, insofar as one evolutionary affordance of limbic structures is attentional priority toward violent and sexual stimuli.

Attentional narrowing occurs because attention and working memory are limited capacity resources (Lang, 2000). In the presence of emotional arousal, the cues directly responsible for emotional arousal benefit from enhanced attention, whereas the cues not responsible for emotional arousal suffer from impaired attention (Christianson, 1992; Mandler, 1992). Put differently, violent and sexual cues are processed as central cues, whereas surrounding cues are processed as peripheral cues (Christianson, 1984; Easterbrook, 1959; Lang, Newhagen, & Reeves, 1996). Several studies have confirmed that advertisements embedded in violent or sexual media contexts are processed as peripheral cues, whereas the violent or sexual content are processed as central cues (e.g., Bushman & Bonacci, 2002; Parker & Furnham, 2007).

There is reason to believe that similar effects may occur when advertisements themselves feature violent and/or sexual content independent from the media content in which they are embedded. For example, several studies found that brands advertised in print using sexual content are remembered less often than brands advertised using nonsexual content (Alexander & Judd, 1978; Richmond & Hartman, 1982; Weller, Roberts, & Neuhaus, 1979). Another study found that brands advertised on TV using violent content are remembered less often than brands advertised using nonviolent content (Bushman, 2007). One scholar proposed that sex appeal is effective at attracting attention to an ad, but memory of the advertised brand is inhibited by sexual content (Reichert, 2002). Psychophysiological research supports this conclusion. For example, participants in one experiment allocated more attentional resources to ads with sexual content than to ads without sexual

content, as indicated by heart rate and postauricular reflex data (Sparks & Lang, 2015).

In light of converging evidence, we propose a unifying theoretical framework for both media content and ad content: emotionally arousing details such as violence and sex draw attention to themselves at the expense of surrounding details that are less emotionally arousing. As a result, details such as brands advertised in violent and/or sexual contexts are remembered less often than brands advertised in nonviolent and nonsexual media contexts. Likewise, because memory precedes attitudes and buying intentions in the information processing model of advertising, we propose that brands advertised in violent and/or sexual media contexts lower attitudes and buying intentions compared to brands advertised in nonviolent and nonsexual media contexts (Shimp & Gresham, 1983). Of course, several important moderators may qualify these proposed effects. We discuss some of these in the next section.

Potential Moderators

The previous meta-analysis included 12 studies involving 1,700 participants (Bushman & Phillips, 2001), whereas this review includes 53 studies involving 8,489 participants. Moreover, the previous meta-analysis only examined the effect of violent media content on brand memory. This review examines the effects of violent and sexual media content, as well as violent and sexual ad content, on brand memory, brand attitudes, and buying intentions. In addition, we examine several theoretically meaningful moderator variables. Although overall effects are informative, they might be qualified by these key moderator variables.

Program/Advertisement Congruity: Priming or Interference?

One potential exception to the general pattern that violent and sexual media and ad content impair brand memory and reduce brand attitudes and buying intentions might occur when both the media and advertisement content match (e.g., a violent ad placed in a violent TV program). This is known as program/advertisement congruity (Bello, Pitts, & Etzel, 1983). Although congruity has been studied for decades, researchers dispute whether congruity facilitates or impairs memory, attitudes, and buying intentions. Two competing hypotheses have been offered to explain program/advertisement congruity effects: (1) the congruity priming hypothesis, and (2) the cognitive interference hypothesis.

Congruity priming hypothesis. According to the congruity priming hypothesis, placing violent advertisements in a violent program or sexual advertisements in a sexual program facilitates memory and improves attitudes and buying intentions (Gunter, Furnham, & Pappa, 2005). Proponents of this hypothesis propose a spreading activation model for this effect, whereby the content of the program increases the accessibility of similar content in the advertisement (Sanbonmatsu & Fazio, 1991). Because violent programs prime or activate violent thoughts in memory, they make violent advertisements more accessible. Similarly, because sexual programs prime or activate sexual thoughts in memory, they make sexual advertisements more accessible. Several studies have found evidence for the congruity priming hypothesis (Gunter et al., 2005; Gunter, Tohala, & Furnham, 2001; Leka, McClelland, & Furnham, 2013). Our review will test the congruity priming hypothesis using all available studies.

Cognitive interference hypothesis. Contrary to the congruity priming hypothesis, the cognitive interference hypothesis suggests that placing violent advertisements in a violent program or sexual advertisements in a sexual program impairs memory and reduces attitudes and buying intentions (Furnham, Gunter, & Walsh, 1998). Proponents of this hypothesis argue that advertisements placed in congruent contexts are susceptible to "meltdown," a process whereby memory traces of the advertised brand fuse with the surrounding program content and make it more difficult to remember the brand (Bryant & Zillmann, 1994). Therefore, advertisements placed in incongruent contexts are preferable because they are more likely to stand out from the surrounding program content (Furnham, Gunter, & Richardson, 2002). Several studies have found evidence for the cognitive interference hypothesis (Cruz & Lull, 2014; Dickinson, Hanus, & Fox, 2013; Furnham & Goh, 2014; Furnham et al., 2002; Furnham & Price, 2006). Our review will test the cognitive interference hypothesis using all available studies.

Content Intensity: Distraction and Indecency Hypothesis

Another potential moderator is the intensity of violent and sexual content contained in media and advertisements. Although research addressing content intensity is much less prevalent than research addressing program/advertisement congruity, the available research suggests that content intensity might moderate the effects of sexual advertisements. Some studies explicitly code content intensity (e.g., Grazer, 1981; Judd & Alexander, 1983), whereas other studies vary content intensity but do not code for it (e.g., Putrevu, 2008; Sabri & Obermiller, 2012). Unfortunately, we could only examine the effects of the intensity of sexual content in advertisements. We could not code the content intensity for violent or sexual programs because authors seldom report this information, and it typically varies during the course of a program (e.g., an intense sexual scene may be followed by an innocuous business meeting scene). Likewise, we could not code the level of violence in advertisements because authors seldom report this information (for an exception see Prasad & Smith, 1994).

The distraction and indecency hypothesis is proposed to explain content intensity effects. The general prediction of the hypothesis is that as content intensity increases, advertising effectiveness decreases. The specific mechanisms through which advertising effectiveness decreases are distraction, which accounts for memory impairments, and indecency evaluation, which accounts for less favorable attitudes and weaker buying intentions.

We propose that content intensity exacerbates the effect of sexual advertisements on brand memory because content becomes more distracting as it intensifies. For example, a nude model is likely to draw more attention away from an advertised product than a fully clothed model. Previous studies have supported this prediction (Judd & Alexander, 1983; Peterson & Kerin, 1977). This hypothesis coincides with evolutionary theory that predicts people are hard-wired to pay attention to violence and sex, and that emotional arousal from violence and sex diverts limited attention away from advertised brands.

Likewise, we propose that content intensity exacerbates the effects of sexual advertisements on brand attitudes and buying intentions because content is more likely to be evaluated as indecent as it intensifies. For example, a viewer is more likely to object

to a commercial showing partially nude models in a sexually suggestive embrace than to a commercial showing fully clothed models holding hands while walking (e.g., Latour & Henthorne, 1994). In turn, negative evaluations of the ad become associated with the advertised brands. Previous studies have supported this prediction (Judd & Alexander, 1983; Peterson & Kerin, 1977).

Other Moderators

We also examined three other moderators that are commonly included in media effects meta-analyses: year of publication, participant gender, and participant age. We did not have prior justification to predict moderator effects for any of these variables, but it is important to note that all three have been significant moderators in previous media effects meta-analyses. For example, advertising meta-analyses have found moderator effects for year of publication on humor (Eisend, 2010) and advertising elasticity (Sethuraman, Tellis, & Briesch, 2011). A media effects meta-analysis found moderator effects for age on body image concerns (Grabe, Ward, & Hyde, 2008). A violent media meta-analysis found moderator effects for gender on children's enjoyment of fright and violence (Hoffner & Levine, 2005), and a sexual media meta-analysis found moderator effects for gender on emotional responses to sexually explicit materials (Allen et al., 2007). Therefore, we examined year of publication and participant gender and age as potentially relevant moderators.

Method

Literature Search

To locate relevant studies, we searched two electronic databases: *PsycINFO* (1880 to 2014) and *Communication and Mass Media Complete* (1912 to 2014). It is interesting that the first sexual print ad (for Woodbury Soap) was published in 1911; the first nude print ad (also for Woodbury Soap) appeared in 1936 and showed a full body photograph of a woman sitting at a beach, with her arm at her side covering her breasts.

A broad search was conducted to be sure that no relevant studies were excluded. We considered the effects of violent (*aggress** or *violen**) and sexual (*sex** or *erotic** or *porn**) media and ad content (*advert** or *commercial**) on brand memory (*memory* or *remember** or *recall** or *recogni**), brand attitudes (*attitud**), and buying intentions (*intention**). The asterisk allows terms to have all possible endings (e.g., the term *sex** will retrieve studies that used the terms *sex*, *sexual*, *sexualized*, etc.). As is often the case with meta-analyses (e.g., Burnette et al., 2013; Bushman & Phillips, 2001), this broad search yielded a large number of studies—1,869, but not all were relevant. To determine whether articles were relevant, we read the titles, abstracts, or both.

We also searched ProQuest and Google Scholar citations of previously located articles to locate unpublished studies, dissertations, and conference papers to include in the database to address potential publication bias (i.e., the "file drawer problem"; Rosenthal, 1979). We found seven studies from five unpublished research reports including master's theses, doctoral dissertations, and conference proceedings.

Inclusion Criteria

Studies had to meet three criteria to be eligible for inclusion: (a) violent, sexual, or both violent and sexual stimuli in media content, ad content, or both media content and ad content; (b) the inclusion of a control group (without violence or sex); and (c) measures of brand memory, brand attitudes, and/or buying intentions.

Stimuli. Only studies that featured violent, sexual, or both violent and sexual stimuli in media content, ad content, or both media content and ad content were eligible for inclusion. There were three commonly provided criteria we used to operationalize violent and sexual stimuli.

First, most studies using film clips included MPAA ratings, studies using TV programs released after 1997 (when the FCC first issued the TV Parental Guidelines) included FCC ratings, and some studies using video games included ESRB ratings. Among these studies, the majority of films were rated PG-13 or R and included specific content warnings for violent or sexual content (e.g., Gunter et al., 2005). The majority of TV programs were rated TV-14 or TV-MA and also included specific content warnings for violent or sexual content (e.g., Bushman, 2005). Several video games were rated M and included specific content warnings for violent or sexual content as well (e.g., Lull, Gibson, Cruz, & Bushman, 2015). Studies like these also included successful manipulation checks for violence or sex. We recommend the combination of agency-issued content ratings and manipulation checks as the best procedure for operationalizing violent or sexual stimuli.

A second criterion for operationalizing violent and sexual stimuli was pretesting. Many researchers created large databases of potential exemplars and conducted pretests (e.g., surveys, qualitative focus groups) to determine which stimuli best represented violence or sex (e.g., Furnham & Hiranandani, 2009). This procedure was especially common for selecting print ad stimuli (e.g., Jones, Stanaland, & Gelb, 1998). This was also a sufficient operationalization approach.

The third criterion for operationalizing violent and sexual stimuli was qualitative interpretation. This approach was especially common for older studies (e.g., Goldberg & Gorn, 1987). Authors described the stimuli and we used their descriptions to determine whether the stimuli met the definition of violence proposed by the National TV Violence Study (Federman, 1998) or the definition of sex proposed by a prominent group of sexual media researchers (Farrar et al., 2003). Violence was defined as "any overt depiction of a credible threat of physical force or the actual use of such force intended to physically harm another animate being or group of beings" (Federman, 1998). Sex was defined as "any depiction of talk or behavior that involves sexuality, sexual suggestiveness, or sexual activities and relationships" (Farrar et al., 2003). Although using these definitions does increase the potential for subjective interpretation, this procedure was useful in situations where more convincing data-based criteria were not available. Further stimuli details are available in Appendix B.

Control group. A study was eligible if one group was exposed to media content (e.g., TV, film, video games)[3] or ad content containing violence, sex, or both violence and sex, and the other

[3] All film studies (e.g., Gunter, Furnham, & Pappa, 2005) presented media content and ad content similarly to TV studies. In other words, commercial breaks were inserted into the film as they would be inserted into a TV program.

(control) group was exposed to media content or ad content containing no violence or sex.

Media content versus ad content. The process of classifying studies as media content or ad content is typically simple with print, TV, and films. The important question is whether violence, sex, or both violence and sex are included in the program, the ad, or both the program and the ad. In these contexts, programs and ads are typically separate from each other, either in the form of commercial breaks (TV, films) or print ads distinct from editorial content.

One context in which making such a distinction is difficult is when products are placed within programs. In product placement contexts, the ad is part of the program, and therefore the distinction is more arbitrary. There was one product placement study that met the other inclusion criteria (Berger, 2012). Furthermore, all video game studies were considered product placement studies because players saw the ads while playing the game, rather than in a commercial break external to gameplay.

We decided to classify product placement studies as media content. We did so because the central activity in a product placement context is either viewing a program or playing a game, not viewing a brand. In other words, participants in product placement studies are likely to prioritize the storyline and gameplay rather than the presence of brands. Therefore, we contend that product placement studies are best classified as media content.

Between-subjects, within-subjects, and mixed designs. Eligible experiments and surveys included between-subjects designs with separate experimental and control groups, within-subjects designs in which participants served as their own control group, and mixed designs with both between-subjects and within-subjects factors. Within-subjects and mixed designs were common among ad content studies, some of which presented multiple ads and, therefore, exposed individual participants to all four types of ads (violent, sexual, both violence and sex, and neither violence nor sex).

Measures. A study was eligible if it included a measure of brand memory, brand attitudes, and/or buying intentions.

Brand memory. Brand memory measures included both recall and recognition. Recall measures asked participants to list advertised brands without cues. Recognition measures asked participants to choose advertised brands with cues (e.g., advertised brand listed among other foil brands). This distinction between recall and recognition is commonly used in psychology (e.g., Gillund & Shiffrin, 1984) and advertising (e.g., Keller, 1993).

Brand attitudes. Brand attitude measures commonly asked participants to indicate their agreement with phrases such as "this product is good" or select a number that corresponded with how well they rated the product (e.g., 1 = *very bad* to 7 = *very good*).

Buying intentions. Buying intentions measures commonly asked participants to indicate their agreement with phrases such as "I would purchase this product" or select a number that corresponded with how likely they would be to purchase the product (e.g., 1 = *very unlikely* to 5 = *very likely*). In other studies, participants choose coupons for advertised and non-advertised products (Bushman, 2005).

In total, 44 research reports that included 53 individual studies of 8,489 participants met the inclusion criteria. Table 1 summarizes the number of included studies according to the type of content (violent, sexual, or both), context (media, ad), and program/advertisement congruity (congruent, incongruent). Table 2 includes information regarding the type of content in each individual study. Included studies are marked with an asterisk in the References section.

Table 1
Summary Table: Number of Studies (K) Containing Violent, Sexual, or Both Violent and Sexual Media Content or Ad Content; Number of Studies Containing Congruent or Incongruent Programs/Advertisements

	Context		Congruity	
Content	Media	Ad	Congruent	Incongruent
Violent	30	4	2	31
Sexual	11	25	5	30
Both	4	1	1	5

Moderator Variables

We considered the role of moderator variables on the magnitude of observed effects. To test the potential effects of program/advertisement congruity, we coded whether media content and ad content were congruent (i.e., *violent ad embedded in a violent program, sexual ad embedded in a sexual program*). To test the distraction and indecency hypothesis, we coded the level of sex for sexual ads: 0 = *none*, 1 = *suggestive content* (e.g., 1980 Calvin Klein jeans commercial featuring Brooke Shields, see Bello et al., 1983), 2 = *revealing clothes* (e.g., couple embracing erotically, see Sabri & Obermiller, 2012), 3 = *breasts or buttocks visible* (e.g., Putrevu, 2008), or 4 = *genitals visible* (e.g., Alexander & Judd, 1978). We also coded year of publication, mean age of participants, and percentage of male participants as continuous moderators.

Meta-Analytic Procedures

Effect size estimation. We used the standardized mean difference (*d*) as the effect size estimate, which gives the number of *SD*s between two group means (e.g., violent vs. nonviolent TV program). We used *d* because the majority of included studies measured differences in continuous outcomes between independent groups exposed to different experimental manipulations (Lipsey & Wilson, 2001). When *d* was not reported, we calculated it for studies that included sufficient information (e.g., *M*s, *SD*s, *t*-statistics, *F*-statistics, etc.; see Lipsey & Wilson, 2001 for calculation details). Studies that reported different effect size estimates (e.g., correlation coefficient *r*s, mean square contingency coefficient ϕs) were converted to *d*s.

We corrected for dependence between means in studies that had within-subjects components by using appropriate formulas (Morris & DeShon, 2002). More specifically, correlations between dependent means were included in effect size calculations for these studies. If correlations were not reported, we used available information to estimate them (e.g., *M*s, *SD*s, *t*-statistics; see Morris & DeShon, 2002). More important, we were able to combine within-subjects and between-subjects designs in the final analyses because the studies met the three necessary criteria: (1) effect sizes were transformed into common metrics; (2) effect sizes from each design estimated similar treatment effects (e.g., differences in

Table 2
Summary Table of Effect Sizes (Standardized Mean Difference) for Meta-Analyses: Differences in Brand Memory, Brand Attitudes, and Buying Intentions Between Experimental (Exposed to Violent or Sexual Media Content or Ad Content) and Control Groups

Source	*N*	Brand memory		Brand attitudes		Buying intentions	
		Media	Ad	Media	Ad	Media	Ad
Alexander and Judd (1978)[b]	181		−0.88				
Bello, Pitts, and Etzel (1983)[b]	217			−0.26	−0.26	−0.24	0.19
Berger (2012)[a]	119	−1.66					
Bryant and Comisky (1978)[a]	120	−1.25				0.56	
Bushman (1998) Study 1[a]	200	−0.43					
Bushman (1998) Study 2[a]	200	−0.39					
Bushman (1998) Study 3[a]	320	−0.26					
Bushman (2005)[a,b,c]	336	−0.60				−0.54	
Bushman (2007)[a,b]	324	−0.36	−0.20				
Bushman and Bonacci (2002)[a,b]	324	−0.77					
Chestnut, LaChance, and Lubitz (1977)[b]	103		0.27				
Dudley (1999)[b]	378				0.06		0.29
Ferguson et al. (2010)[a,b,c]	212	0.52	0.64			0.17	0.25
Fried and Johanson (2008) Study 1[a,b,c]	111	0.11					
Fried and Johanson (2008) Study 2[a,b,c]	104	−0.19					
Fried and Johanson (2008) Study 3[a,b]	235	0.17					
Furnham and Hiranandani (2009)[b]	88	−0.07	0.41				
Furnham and Mainaud (2011)[b]	82	−0.17	0.28				
Goldberg and Gorn (1987) Study 1[a]	160	−0.19				0.06	
Goldberg and Gorn (1987) Study 2[a]	63	−0.32					
Grazer (1981)[b]	230		0.01				0.34
Gunter, Furnham, and Pappa (2005)[a]	80	−0.05	0.23				
Jones, Stanaland, and Gelb (1998)[b]	300		−0.20		−0.14		
Judd and Alexander (1983)[b]	96		−0.43		−1.37		
Kennedy (1971) Study 1[a]	78	−0.15		−0.43			
Kennedy (1971) Study 2[a]	138	−0.26		−0.32			
LaTour and Henthorne (1994)[b]	199				−0.31		−0.49
Lull et al. (2015) Study 1[a]	154	−0.40		−0.47			
Lull et al. (2015) Study 2[a]	102	−0.44		0.03			
Lynn (1995)[b]	243		−0.20		−0.42		−0.33
Mathur and Chattopadhyay (1991)[a]	64	−0.64					
Melzer, Bushman, and Hofmann (2008)[a]	19	0.04					
Mundorf, Zillmann, and Drew (1991)[a]	48	−0.55					
Murphy, Cunningham, and Wilcox (1979)[a]	115	0.12					
Murry, Lastovicka, and Singh (1992)[a]	203	−0.05					
Parker and Furnham (2007)[b]	60	−1.11	−0.67				
Patzer (1980)[b]	60		−0.68				0.27
Peterson and Kerin (1977)[b]	224				−0.52		
Prasad and Smith (1994)[a]	95	−0.38		−1.02			
Putrevu (2008) Study 1[b]	103		0.55		−0.11		0.16
Putrevu (2008) Study 2[b]	99		0.52		−0.09		0.12
Reidenbach and McCleary (1983)[b]	320						−0.14
Richmond and Hartman (1982)[b]	384		−0.50				
Sabri and Obermiller (2012)[a,b,c]	240				−0.14		−0.15
Severn, Belch, and Belch (1990)[b]	180		−0.23				0.38
Shen (2001)[a]	85	−0.58		−0.52		−0.19	
Simpson, Horton, and Brown (1996)[b]	341				−0.22		−0.21
Soldow and Principe (1981)[a]	87	−1.07				−0.75	
Steadman (1969)[b]	60		−0.18				
Waiguny, Nelson, and Marko (2013) Study 1[a]	51			−0.44			
Waiguny, Nelson, and Marko (2013) Study 2[a]	56			0.12			
Weller, Roberts, and Neuhaus (1979)[b]	30		−0.42				
Yoo and Peña (2011)[a]	68	−0.72		−0.45		−0.28	

[a] Violent content. [b] Sexual content. [c] Violent and sexual content combined.

memory, attitudes, or intentions as a function of violent and/or sexual media content and/or ad content); and (3) sampling variances were estimated according to the design of each individual study (Morris & DeShon, 2002).

Analysis strategy. Data were analyzed using Comprehensive Meta-Analysis software (Version 2.2.064; Borenstein, Hedges, Higgins, & Rothstein, 2011). We used random-effects meta-analytic procedures for all analyses. Random-effects models assume that effect sizes differ from population means by both participant-level sampling error and also study-level variability (Borenstein, Hedges, & Rothstein, 2007). In contrast, fixed-effects models assume only participant-level sampling error. Random-

effects models are more conservative than fixed-effects models, but they require fewer statistical assumptions and allow for generalizations to a broader set of studies than only the ones included in the meta-analysis (Hunter & Schmidt, 2004; Lipsey & Wilson, 2001).

For studies that reported multiple effect sizes, we used a shifting unit of analysis approach (Cooper, 1989). Each statistical test was coded as if it were an independent event. For example, if a study included both brand recall and brand recognition tests of ads embedded in a violent, sexual, or neutral TV program, four effect-size estimates were coded (i.e., violent vs. neutral media content/brand recall, sexual vs. neutral media content/brand recall, violent vs. neutral media content/brand recognition, sexual vs. neutral media content/brand recognition). For the overall effect, the four effect-size estimates were averaged so that the study provided only one effect-size estimate (i.e., effect of violent and sexual media content (combined) vs. neutral media content on brand recall and brand recognition (combined). For an analysis comparing violent versus sexual media content, the study provided two effect-size estimates (i.e., effect of violent media content vs. neutral media content on brand recall and brand recognition [combined], effect of sexual media content vs. neutral media content on brand recall and brand recognition [combined]). For an analysis comparing brand recall versus brand recognition, the study also provided two effect-size estimates (i.e., effect of violent and sexual media content [combined] vs. neutral media content on brand recall, effect of violent and sexual media content [combined] vs. neutral media content on brand recognition). Thus, the shifting unit of analysis retains as much data as possible without violating the independence assumption that underlies the validity of meta-analytic procedures.

Intercoder reliability. Coded characteristics included whether media content was violent, sexual, or both violent and sexual; whether ad content was violent, sexual, or both violent and sexual; whether media content and ad content were congruent or incongruent; memory measure for memory studies; level of sex for sexual ad studies; year of publication; mean age of participants; and percentage of male participants. Most of the coded characteristics were explicitly labeled in the original studies, so we expected perfect agreement on those characteristics. One possible exception was level of sex for sexual ad studies, which was only coded in some original studies. Studies that did not report any age or gender information were not included in moderator analyses for those variables. Mean age of participants for studies that reported undergraduate samples without specific age details was coded as 21 years old because 21 is the median age within the largest age demographic enrolled at 4 year institutions (18–24 year olds; U.S. Census Bureau, 2012). Two independent judges coded these characteristics for all 53 studies included in the review. There was perfect interrater agreement on all coded characteristics (κ = 1.0).

Results

Violence and Sex Effects Aggregated Versus Separated

We present several analyses in the following sections. First, we present the aggregated effects that are obtained when we include all studies that used violent and/or sexual stimuli. These overall analyses do not distinguish between violence and sex because we propose both to be emotionally arousing. One advantage of this approach is that it combines the comparisons within each individual study, minimizing the potential of each individual study to contaminate overall effects with confounds. One disadvantage of this approach is that the separate effects of violence and sex cannot be determined.

Therefore, we also present analyses that separate studies with violent and/or sexual stimuli from each other. One advantage of this approach is that it allows us to determine the specific effects of each type of stimulus. One disadvantage of this approach is that it treats multiple comparisons within each individual study as independent, increasing the potential of each individual study to contaminate overall effects with confounds.

Both types of analysis provide valuable information for inference. The aggregated effects allow us to test our theoretical framework, which does not distinguish between the effects of violence and sex. The stimuli-separated effects allow us to determine if violence and sex have different effects on brand memory, brand attitudes, and buying intentions.

We examined the meta-analytic effects for three potential outcomes (*brand memory*, *brand attitudes*, or *buying intentions*) as a function of two potential content locations (*media*, *ads*), for a total of six types of effects. Because both content locations and outcomes differed across studies, the number of meta-analytic studies (*k*s) for aggregated analyses ranged from 8 to 31. Because individual studies could contribute multiple effects, the number of meta-analytic studies (*k*s) for separated analyses ranged from 2 to 33. Table 2 gives a summary of aggregated effect sizes across studies.

We also examined several potential moderators. Categorical moderators were examined using meta-analytic analysis of variance (ANOVA) analogues. Continuous moderators were examined using meta-analytic regression analogues when there were at least 10 eligible studies, as recommended by the Cochrane Collaboration for Systematic Reviews (Higgins & Green, 2011). Results for aggregated meta-analyses, separated meta-analyses, and categorical moderators are included in Table 3.

Memory

Media content. Four types of memory measures were used: recall of brands and ads, and recognition of brands and ads. Because the magnitude of effects did not depend on the type of memory measure [$\chi^2(3) = 1.85$, $p = .61$], the four types of memory measures were combined for subsequent analyses.

Overall, memory for brands and ads was significantly impaired in programs containing sex, violence, or both sex and violence, $d_+ = -0.39$; 95% CI = −0.55, −0.22; $k = 31$. Although type of content did not significantly moderate the magnitude of the effect [$\chi^2(2) = 2.45$, $p = .29$], only the confidence interval for violence excluded the value zero: sex [$d_+ = -0.17$; 95% CI = −0.49, 0.15; $k = 15$], violence [$d_+ = -0.31$; 95% CI = −0.46, −0.16; $k = 33$], and both violence and sex [$d_+ = 0.064$; 95% CI = −0.42, 0.55; $k = 6$].

Ad content. As with media content, the magnitude of effects for ad content did not depend on the type of memory measure, $\chi^2(3) = 1.06$, $p < .79$. Thus, the four types of memory measures were combined for subsequent analyses.

There was no overall memory impairment for brands and ads in sexual ads or violent ads, $d_+ = -0.08$; 95% CI = −0.27, 0.12; $k = 19$. Effect sizes did not differ for sexual ads [$d_+ = -0.08$;

Table 3
Aggregated and Stimuli-Separated Random-Effects Meta-Analysis Results by Content Location (in Media, in Ads) and Program/Advertisement Congruity

Variable[a]	*k*	*N*	*d*	95% CI		Variance Statistics		
				LL	*UL*	τ^2	*SE*	*z*
Brand memory								
Aggregated								
Media	31	3,907	−0.39*	−0.55	−0.22	.159	0.058	2.74*
Ad	19	3,528	−0.08	−0.27	0.12	.137	0.069	1.99*
Congruent	8	366	0.36*	0.01	0.70	.182	0.137	1.33
Incongruent	72	7,129	−0.25*	−0.35	−0.14	.151	0.037	4.08*
Separated								
Violent media	33	3,812	−0.31*	−0.46	−0.16	.147	0.052	2.83*
Violent ads	3	362	0.14	−0.57	0.85	.340	0.415	0.82
Sexual media	15	1,484	−0.17	−0.49	0.15	.331	0.165	2.01*
Sexual ads	18	3,226	−0.08	−0.28	0.11	.130	0.067	1.94†
V & S media	6	591	0.06	−0.42	0.55	.322	0.241	1.34
Brand attitudes								
Media	9	778	−0.37*	−0.55	−0.18	.029	0.039	0.74
Ad	11	2,614	−0.32*	−0.55	−0.10	.121	0.070	1.73†
Buying intentions								
Aggregated								
Media	8	1,390	−0.26*	−0.53	0.00	.102	0.081	1.26
Ad	13	3,318	0.04	−0.12	0.20	.067	0.038	1.76†
Congruent	4	318	0.21*	0.02	0.40	.000	0.031	0.00
Incongruent	35	4,390	−0.04	−0.15	0.08	.086	0.031	2.77*
Separated								
Violent media	7	734	−0.27*	−0.53	−0.01	.074	0.070	1.06
Violent ads	5	544	0.03	−0.27	0.32	.076	0.080	0.95
Sexual media	3	382	−0.19	−0.63	0.26	.121	0.155	0.78
Sexual ads	22	4,933	0.10	−0.03	0.23	.074	0.033	2.24*
V & S media	2	274	−0.24	−0.91	0.44	.204	0.332	0.61

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit; τ^2 = Variance; V & S = both violent and sexual. Sample sizes differ between aggregated and separated results because of the shifting unit of analysis-studies that only contribute one combined effect in the aggregated results can contribute more than one effect in the separated results and, therefore, contribute different sample sizes to each analysis.
[a] There were not enough studies to analyze (a) the effects of both violent and sexual ads on all three outcomes; (b) the effect of congruity on brand attitudes; (c) the effect of sexual media on brand attitudes; and (d) the effect of violent ads on brand attitudes.
† $p < .10$. * $p < .05$.

95% CI = −0.28, 0.11; $k = 18$] and violent ads [$d_+ = 0.14$; 95% CI = −0.57, 0.85; $k = 3$], $\chi^2(1) = 0.36$, $p = .55$. Both confidence intervals included the value zero.

Moderator analyses. The results supported the congruity priming hypothesis. Memory was significantly facilitated when media and ad content matched [$d_+ = 0.36$; 95% CI = 0.01, 0.70; $k = 8$], whereas memory was significantly impaired when media and ad content did not match [$d_+ = -0.25$; 95% CI = −0.35, −0.14; $k = 72$], $\chi^2(1) = 10.45$, $p < .001$.

Although there was no overall memory impairment effect for sexual ads or violent ads, the distraction and indecency hypothesis was supported for studies that included sexual ads. The higher the level of sexual content in the ad, the greater the memory impairment, $b = -0.24$, 95% CI = −0.32, −0.16, $z = -5.73$, $p < .0001$, $k = 29$; see Figure 1). The confidence interval for the negative slope excluded the value zero.

Year of publication did not moderate effect size for media content, $b = 0.005$, 95% CI = −0.001 to 0.01, $z = 1.51$, $p = .13$, $k = 37$. However, year of publication moderated effect size for ad content, $b = 0.01697$, 95% CI = 0.011 to 0.023, $z = 5.69$, $p < .0001$, $k = 21$ (see Figure 2). In other words, impairments for brands advertised in violent or sexual ads have decreased over time.

Mean age of participants did not moderate effect size for media content, $b = -0.01$, 95% CI = −0.03 to 0.0007, $z = -1.85$, $p = .06$, $k = 32$. Mean age of participants also did not moderate effect size for ad content, $b = -0.002$, 95% CI = −0.05 to 0.05, $z = -0.08$, $p = .94$, $k = 17$.

Percentage of male participants moderated effect size for media content, $b = -2.17762$, 95% CI = −3.09 to −1.26, $z = -4.66$, $p < .0001$, $k = 26$. Percentage of male participants also moderated effect size for ad content, $b = -0.5198$, 95% CI = −0.97 to −0.07, $z = -2.24$, $p = .02$, $k = 17$. In other words, brand memory impairments were larger in media and ad content studies that had more male participants.

Brand Attitudes

Media content. Overall, attitudes were significantly less favorable for brands embedded in violent media than for the same brands embedded in neutral media, $d_+ = -0.37$; 95% CI = −0.55, −0.18; $k = 9$.

Only one study examined attitudes for brands in sexual media, so we were not able to conduct meta-analyses for sexual media (Bello et al., 1983). However, that study's effect size was in the

same direction as the effect sizes for violent media, $d = -0.26$, 95% CI = −0.52, 0.01.

Ad content. Overall, attitudes were significantly less favorable for brands in sexual ads than for the same brands in neutral ads, $d_+ = -0.32$; 95% CI = −0.55, −0.10; $k = 11$.

Only one study examined attitudes for brands in violent ads, so we were not able to conduct meta-analyses for violent ads (Sabri & Obermiller, 2012). However, that study's effect size was in the same direction as the effect sizes for sexual ads, $d = -0.27$, 95% CI = −0.63, 0.09.

Moderator analyses. Only one study examined program/advertisement congruity for attitudes, so we were not able to conduct meta-analyses to test the congruity hypotheses (Bello et al., 1983). Likewise, the authors did not report enough information to calculate the effect sizes for congruity and incongruity, so we cannot report them here. However, the means suggest that there were no congruity effects for that particular study ($M_{\text{Congruent}} = 32.08$; $M_{\text{Incongruent}} = 32.19$).

The distraction and indecency hypothesis was supported for sexual ads. The higher the level of sexual content in the ad, the more negative the attitude for the brand, $b = -0.18$, 95% CI = −0.25, −0.10, $z = -4.85$, $p < .0001$, $k = 17$ (see Figure 3). The confidence interval for the negative slope excluded the value zero.

Year of publication did not moderate effect size for media content, $b = 0.002$, 95% CI = −0.006 to 0.01, $z = 0.40$, $p = .69$, $k = 11$. However, year of publication moderated effect size for ad content, $b = 0.02450$, 95% CI = 0.016 to 0.033, $z = 5.47$, $p < .0001$, $k = 11$ (see Figure 4).[4] In other words, attitudes toward brands advertised using violence or sex have increased over time.

Among media content studies, there were only seven studies that reported mean age of participants and six studies that reported percentage of male participants, so we did not examine age or gender as potential moderators for media content. Mean age of participants did not moderate effect size for ad content, $b = 0.01045$, 95% CI = −0.007 to 0.03, $z = 1.17$, $p = .24$, $k = 10$. Percentage of male participants also did not moderate effect size for ad content, $b = 0.81360$, 95% CI = −0.64 to 2.27, $z = 1.10$, $p = .27$, $k = 10$.

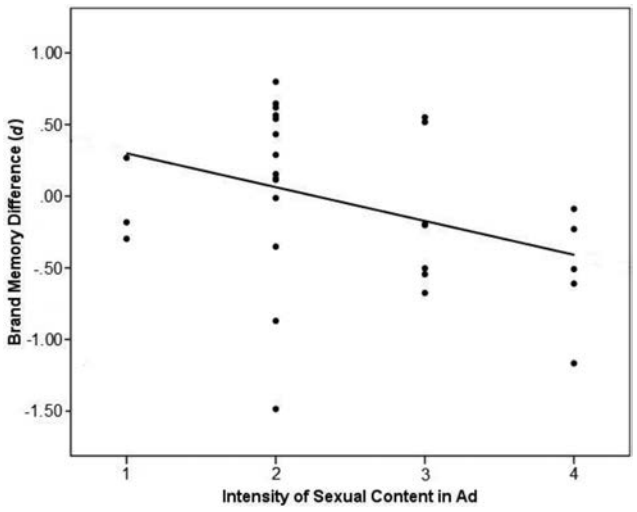

Figure 1. Standardized mean differences in brand memory between experimental and control groups as a function of content intensity in sexual advertisements: 1 = *suggestive content*, 2 = *revealing clothes*, 3 = *breasts or buttocks visible*, 4 = *genitals visible*. Downward slope indicates memory impairment increased as sexual content intensity increased.

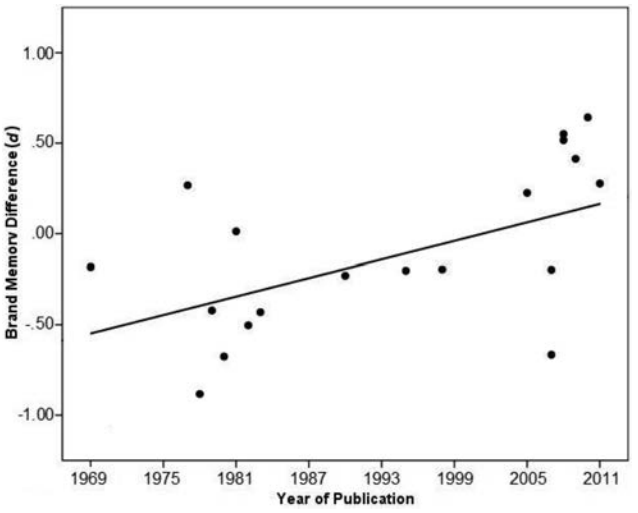

Figure 2. Standardized mean differences in brand memory between experimental and control groups as a function of year of publication. Upward slope indicates memory impairment decreased as year of publication became more recent.

Buying Intentions

Media content. Overall, buying intentions were significantly lower for brands in media containing violence, sex, or both violence and sex than for the same brands in media containing no violence or sex, $d_+ = -0.26$; 95% CI = −0.53, −0.004; $k = 8$. Effects did not significantly differ for programs containing violence ($d_+ = -0.27$; 95% CI = −0.53, −0.013; $k = 7$), sex ($d_+ = -0.19$; 95% CI = −0.63, 0.26; $k = 3$), and both violence and sex ($d_+ = -0.24$; 95% CI = −0.91, 0.44; $k = 2$), $\chi^2(2) = 0.10$, $p < .95$. However, only the confidence interval for programs containing violence excluded the value zero.

Ad content. Overall, buying intentions did not depend on whether the ad contained sex or violence, $d_+ = 0.04$; 95% CI = −0.12, 0.20; $k = 13$. Effect sizes did not significantly differ for sexual ads ($d_+ = 0.10$; 95% CI = −0.03, 0.23; $k = 22$) or violent ads ($d_+ = 0.03$; 95% CI = −0.27, 0.32; $k = 5$), $\chi^2(1) = 0.21$, $p = .65$. Both confidence intervals included the value zero.

Moderator analyses. Although only a few studies examined program/advertisement congruity for buying intentions, there was evidence for the congruity priming hypothesis. Buying intentions were significantly more favorable when media were congruent

[4] Figure 4 indicates that one study appears to be a major outlier (Judd & Alexander, 1983). However, year of publication still moderated effect size for ad content when that study was removed, $b = 0.0108$, 95% CI = 0.001 to 0.0206, $z = 2.17$, $p = .03$. Therefore, substantive conclusions are the same whether or not the outlier is included.

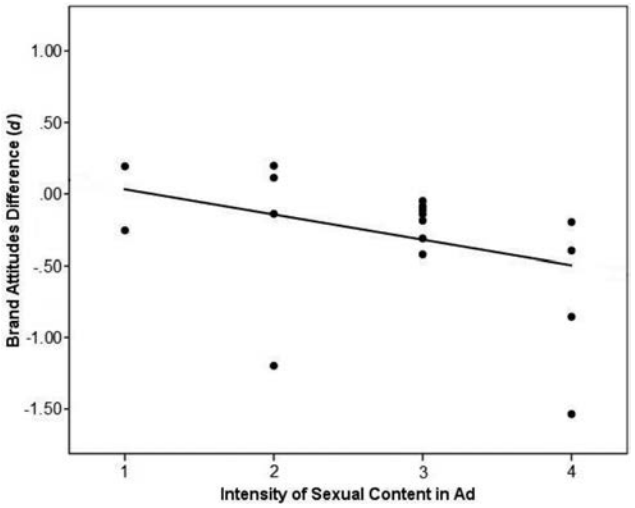

Figure 3. Standardized mean differences in brand attitudes between experimental and control groups as a function of content intensity in sexual advertisements: 1 = *suggestive content*, 2 = *revealing clothes*, 3 = *breasts or buttocks visible*, 4 = *genitals visible*. Downward slope indicates brand attitudes were less positive as sexual content intensity increased.

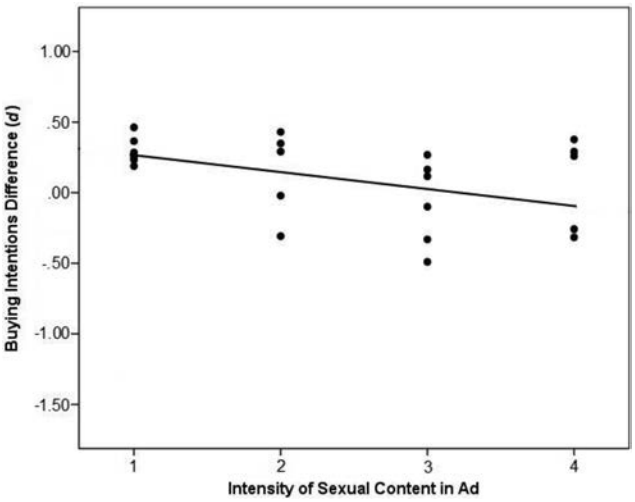

Figure 5. Standardized mean differences in buying intentions between experimental and control groups as a function of content intensity in sexual advertisements: 1 = *suggestive content*, 2 = *revealing clothes*, 3 = *breasts or buttocks visible*, 4 = *genitals visible*. Downward slope indicates buying intentions decreased as sexual content intensity increased.

(d_+ = 0.21, 95% CI = 0.02, 0.40; k = 4), whereas buying intentions were not affected when media content and ad content were not congruent ($d_+ = -0.04$; 95% CI = −0.15, 0.08; $k = 35$), $\chi^2(1) = 4.78$, $p = .03$.

Although there was no overall effect of sexual ads or violent ads on buying intentions, the distraction and indecency hypothesis was supported for sexual ads. The higher the level of sexual content in the ad, the lower the buying intentions for the advertised brand, $b = -0.12$, 95% CI = −0.17, −0.07, $z = -4.45$, $p < .0001$, k = 22 (see Figure 5). The confidence interval for the negative slope excluded the value zero.

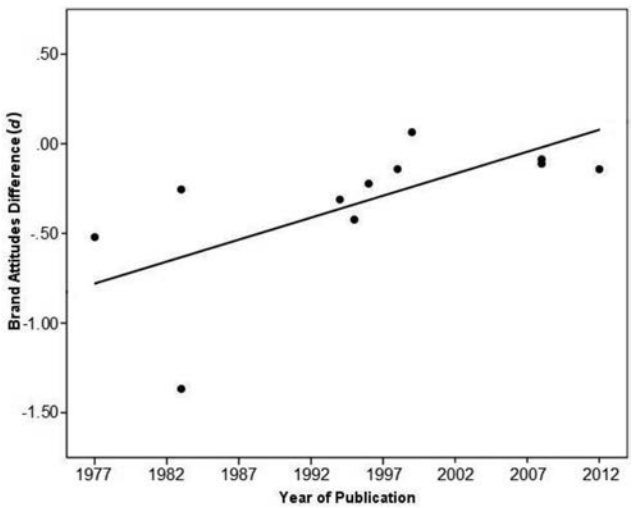

Figure 4. Standardized mean differences in brand attitudes between experimental and control groups as a function of year of publication. Upward slope indicates brand attitudes were more positive as year of publication became more recent.

There were not enough studies to examine year of publication, mean age of participants, or percentage of male participants as potential moderators for media content. There were only eight media content studies in total, and only six reported mean age of participants and percentage of male participants.

Year of publication did not moderate effect size for ad content, $b = -0.004$, 95% CI = −0.01 to 0.003, $z = -1.17$, $p = .24$, k = 18. Percentage of male participants also did not moderate effect size for ad content, $b = -0.02830$, 95% CI = −1.14 to 1.09, $z = -0.05$, $p = .96$, $k = 16$.

Mean age of participants moderated effect size for ad content, $b = -0.01994$, 95% CI = −0.036 to −0.004, $z = -2.42$, $p = .02$, $k = 17$. In other words, buying intentions were lower in ad content studies with older participants.

Publication Bias

In addition to including unpublished studies, dissertations, and conference papers to address the file-drawer problem (see Rosenthal, 1979), publication bias was formally tested with Egger's regression test (Egger, Davey Smith, Schneider, & Minder, 1997), trim and fill analyses (Duval & Tweedie, 2000), and examination of contour-enhanced funnel plots (Peters, Sutton, Jones, Abrams, & Rushton, 2008).

Results for Egger's regression and trim and fill analyses are included in Table 4. Contour-enhanced funnel plots are included in Figures 6–9. Egger's regression indicated that the relationship between sample size and effect size was not significant. Only the trim and fill analysis for the effect of media content on brand attitudes indicated potentially missing studies that decreased the magnitude of effect. The contour-enhanced funnel plot for that particular analysis also indicated that missing studies would be located in the region of statistical nonsignificance, suggesting that funnel plot asymmetry caused by publication bias was a possibility (see Figure 7). However, the confidence interval for the adjusted

Table 4
Results of Egger's Regression and Trim and Fill Selection/Publication Bias Analyses

	Egger's regression	Trim and fill						
		Observed		Imputed				
Variable	b_0[a]	*k*	Obs. *d*	*N*	Direction	Adj. *d*	Change	Strength change
Brand memory								
Media	−1.95	31	−0.39	5	Left	−0.49	−0.10	0.10
Ad	1.12	19	−0.08	0			0.00	0.00
Brand attitudes								
Media	−1.22	9	−0.37	2	Right	−0.29	0.08	−0.08
Ad	−0.57	11	−0.32	4	Left	−0.46	−0.14	0.14
Buying intentions								
Media	0.20	8	−0.26	0			0.00	0.00
Ad	−1.29	13	0.04	3	Left	−0.06	−0.10	0.10

Note. Strength change is the difference between the observed and adjusted effect sizes, taking into account the hypothesized effect direction. Obs. *d* = observed average effect size; Adj. *d* = adjusted average effect size (including imputed studies).
[a] b_0 = Egger's regression intercept. All intercepts are not statistically significant, $p > .10$.

meta-analytic effect with the two missing studies included still excluded the value zero (95% CI = −0.48 to −0.10), so we do not consider the threat of publication bias to be severe.

Discussion

Theoretical Implications

Support for the evolution and emotional arousal framework. This review found evidence that violent media content impairs brand memory, brand attitudes, and buying intentions. These findings are consistent with the evolution and emotional arousal framework, which proposes that people are evolutionarily attuned to emotionally arousing cues at the expense of other cues. In this context, advertised brands are other cues that become peripheral in the presence of violent cues. In the absence of violent media content, individuals can focus attention on the central and peripheral cues in the advertisement. Focusing attention on the brand being advertised, rather than on media violence, should enhance memory, attitudes, and buying intentions for the brand.

This review also found evidence that brands advertised using sexual ads are evaluated less favorably than brands advertised in nonsexual ads. Moreover, the intensity of sexual content in ads moderated the effects of sexual ads on memory, attitudes, and intentions; as content intensified, memory, attitudes, and intentions all decreased. These findings are also consistent with the evolution and emotional arousal framework. It is possible that advertised brands become peripheral when advertised in sexual ads, and that effect is exacerbated when sexual content is more intense.[5]

Potential moderators. The results supported the congruity priming hypothesis. Brands advertised in congruent contexts (e.g., a violent ad placed in a violent TV program) were remembered better and were more likely to be purchased than brands advertised in incongruent contexts. We propose that violent or sexual programs prime violent or sexual thoughts, which in turn make brands advertised congruently more accessible and better remembered, as well as more desirable to purchase. Unfortunately, there were not enough studies to examine the congruity priming hypothesis for brand attitudes.

Publication year. Year of publication moderated ad content effects on both brand memory and brand attitudes. One possible explanation for this finding is that over the years people have become accustomed to seeing violent and sexual ads, and as a result have become desensitized to the attention grabbing impact of such ads. Of course, these findings cannot be interpreted as formal evidence of desensitization because no studies actually examined desensitization outcomes.

Nonetheless, it is still interesting to examine publication year further by using the metaregression results to estimate the expected standardized mean differences for studies published in specific years.[6] For example, the expected *d* for ad content and brand memory for a study published in the same year as the oldest included study (Steadman, 1969) is −0.55, but the expected *d* for a study published in the same year as the newest included study (Furnham & Mainaud, 2011) is 0.16. Likewise, the expected *d* for ad content and brand attitudes for a study published in the same year as the oldest included study (Peterson & Kerin, 1977) is −0.78, but the expected *d* for a study published in the same year as the newest included study (Sabri & Obermiller, 2012) is 0.08. If future studies continue to yield effect sizes similar to the expected *d*s for recent years, which would indicate negligible effects of violent and/or sexual ads on brand memory and brand attitudes, researchers may want to look further into the possibility that people have been desensitized to violent and sexual ads over the years.

Age. Mean age of participants moderated effect size for the effects of violent and sexual ads on buying intentions, suggesting

[5] Although we did not find statistically significant effects for sexual media content, results were in the predicted directions. Moreover, the generally smaller sample sizes for sexual media content than for violent media content suggest that further research regarding sexual media content is needed.

[6] The complete meta-regression equation for the effects of violent and/or sexual ad content on brand memory as moderated by year of publication is $d = -33.96222 + .0167(\textit{Publication Year}) + e$. The complete meta-regression equation for the effects of violent and/or sexual ad content on brand attitudes as moderated by year of publication is $d = -49.21597 + .02450(\textit{Publication Year}) + e$.

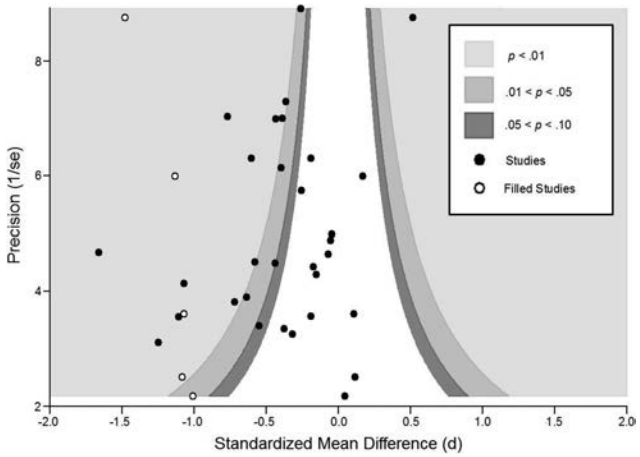

Figure 6. Contour-enhanced funnel plot for trim and fill adjusted meta-analytic effect of violent and/or sexual media content on brand memory.

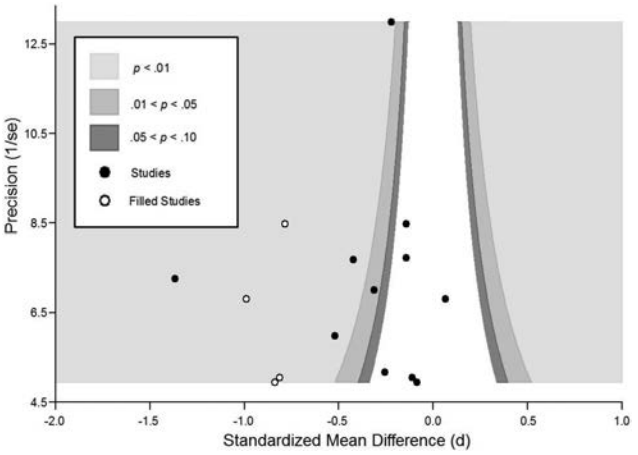

Figure 8. Contour-enhanced funnel plot for trim and fill adjusted meta-analytic effect of violent and/or sexual ad content on brand attitudes.

that decreases in buying intentions as a function of violent and sexual ads were more pronounced for studies with older participants. Older people are more likely to find violent or sexual content offensive (Hargrave & Livingstone, 2009). Evidence that age moderated effect size for buying intentions fits with that finding, insofar as lower buying intentions likely reflects a tendency to not want to purchase products advertised in offensive ways.

Gender. Percentage of male participants moderated effect size for the effects of violent and sexual media content on brand memory, as well as for the effects of violent and sexual ad content on brand memory, suggesting that brand memory impairments were larger in studies that had more male participants. Evidence that gender moderated effect size for brand memory fits with the well-established finding that males are more likely to engage in physical aggression than females (Eagly & Steffen, 1986), insofar as male propensity for violence might be reflected by increased male attention to violence (Neuberg et al., 2010). Likewise, evolutionary theory predicts that males attend to physical attractiveness more than females (Maner et al., 2007). Evidence that gender moderated effect size for brand memory fits that prediction, insofar as physical attractiveness is typically displayed in sexual media and ad contexts. Therefore, if males are more likely to attend to violence and sex, it makes sense that studies with more male participants demonstrated greater brand memory impairments.

Boundary conditions. It is important to first draw attention to several results that we refrain from interpreting as boundary conditions of the framework: the effects of violent ads on brand memory and buying intentions and the effects of sexual media on buying intentions. There were very few studies included in the analyses for these effects. Therefore, instead of interpreting these results as evidence undermining our theoretical framework, we suggest that these are areas in need of further research. We discuss further research in more depth in the Limitations section later in this article.

Sexual ads and sexual media. Other than in moderator analyses, the only sexual ad or sexual media analyses that found

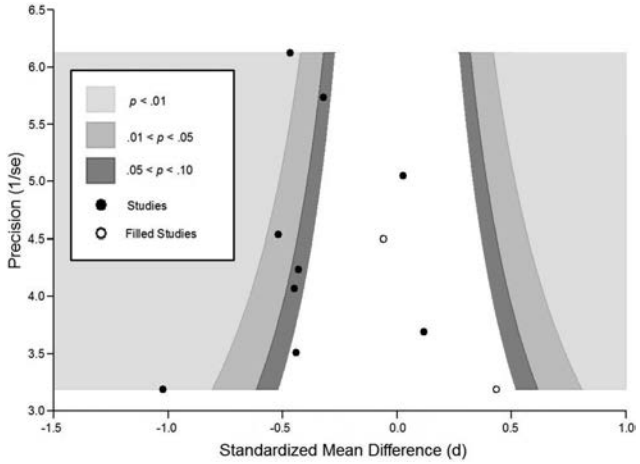

Figure 7. Contour-enhanced funnel plot for trim and fill adjusted meta-analytic effect of violent and/or sexual media content on brand attitudes.

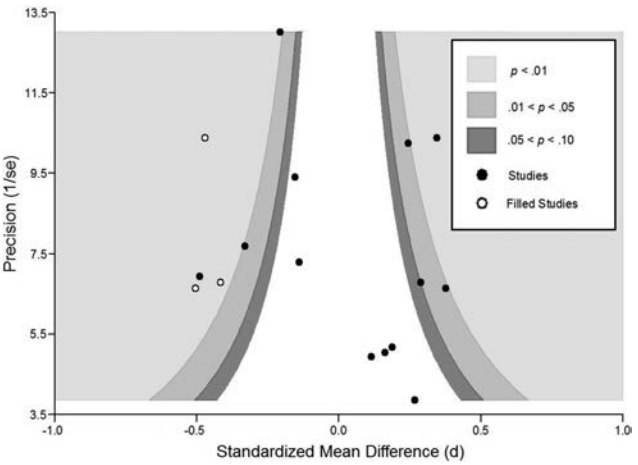

Figure 9. Contour-enhanced funnel plot for trim and fill adjusted meta-analytic effect of violent and/or sexual ad content on buying intentions.

significant results suggested that brands advertised using sexual ads are evaluated less favorably. It is possible that nonsignificant findings regarding brand memory and buying intentions reveal a boundary condition of the evolution and emotional arousal framework. When sex is embedded in an advertisement, it is more proximal to the advertised brand than when it is embedded in a program. Put differently, sexual ad content may draw attention, but not necessarily away from an advertised brand because the sex is positioned close to the advertised brand. Therefore, brands advertised in sexual ads may not be processed as peripherally as brands advertised in violent or sexual media content. However, they still may be evaluated less favorably because the content may be considered offensive (as indicated by support for the content intensity indecency hypothesis).

However, we also did not find significant effects of sexual media on brand memory or buying intentions. In fact, the only effects we found for sexual media content or ad content were for sexual ads, which decreased brand attitudes. Therefore, another possibility is that the qualitative differences between violence and sex may be more influential than we predicted. More important, there was no evidence that any media or ads improved memory for advertised brands, brand attitudes, or buying intentions (with the exception of congruity). Thus, it is not likely that these types of media and ads draw enough "spillover" attention to advertised brands to improve outcomes (i.e., memory, attitudes, or buying intentions), but rather that they have little effect on outcomes.

Excitation transfer as an alternative explanation. One possible alternative explanation for the results is excitation transfer (Zillmann, 1971). Excitation transfer proposes that arousal can be transferred from one media stimulus to another, such as from an arousing program to a subsequent commercial break. As a result, the physiological state activated by the program can influence the processing of the commercials. Indeed, research has found that arousing media content can have a carryover effect to commercial breaks, such that higher skin conductance response frequencies and amplitudes were observed during commercial breaks for participants who viewed an arousing program compared with participants who viewed a calming program (Wang & Lang, 2012). The same study found that brand memory and attitudes are subject to interaction effects between arousal and valence, such that positive arousing content yields the highest brand memory and attitudes. Therefore, the authors proposed a reconceptualization of excitation transfer as simultaneous influence of arousal and valence.

In light of that study, we suggest that excitation transfer remains a possible explanation for our findings. However, we question whether excitation transfer is a useful explanation for our findings. Some scholars suggest that excitation transfer is demonstrated by arousal and valence (Wang & Lang, 2012). Violence and sex can elicit positive or negative valence depending on context. For example, the killing of a villain may elicit positive valence, but injury to a hero may elicit negative valence. These contradictory affective states can exist within the same program and even in the same scene. In fact, entertainment research has found that audiences seek media programs eliciting mixed affect (Oliver & Raney, 2011). In such cases it is difficult to parse exactly how excitation transfer influences subsequent ad processing because valence cannot be categorized as clearly positive or negative.

Therefore, insofar as excitation transfer occurs as an interaction between valence and arousal, we suggest that the more effective explanation of the effects of violent and sexual media and ads retains focus on violence and sex and their consistent influence on arousal rather than on their potentially mutable influence on valence. The evolution and emotional arousal framework we propose is one such explanation.

General implications for evolutionary psychology. Taken together, the findings provide some support for an evolutionary perspective toward advertising effects. Memory for advertised brands is one of the specific areas highlighted in a recent call to use evolutionary perspectives in consumer psychology research (Kenrick, Saad, & Griskevicius, 2013). We agree that memory is an important domain of evolutionary consumer psychology, and we are enthused by the promise that both these findings and future research hold for developing this field.

More broadly, these results provide further evidence that characteristics of memory have adapted according to the demands of evolution (see Howe & Otgaar, 2013; Nairne, 2010). It might be useful to consider the effects of advertising in violent media along with other similar memory characteristics attributed to evolutionary adaptations. For example, enhanced memory for central details versus peripheral details in the context of traumatic experiences has been attributed to evolution and emotional arousal (Berntsen, 2002). Deficits in memory for other-race faces compared with own-race faces (the other-race effect, for a review see Meissner & Brigham, 2001) have also been attributed to evolutionary adaptation (Kelly et al., 2009). Likewise, evolutionary adaptations have been proposed as potential mechanisms underlying errors in eyewitness testimony (Otgaar & Howe, 2014).

Many of the domains in which evolutionary adaptations are invoked to explain memory characteristics have significant legal implications, forming a nascent research field called evolutionary legal psychology (Otgaar & Howe, 2014). Our results support three claims relevant to evolutionary legal psychology. First, violence attracts attention via emotional arousal. Second, violence is processed as a central cue. Third, violent cues are remembered more accurately than copresent, less arousing, peripheral cues.

This application of evolutionary consumer psychology research to evolutionary legal psychology demonstrates an important principle. Namely, basic evolutionary motivations such as survival and reproduction have considerable latitude across the broad canvas that is evolutionary psychology, and often research within particular domains of evolutionary psychology can be used to supplement claims within other domains. Therefore, although the implications of our research are quite clear with respect to consumer psychology, we propose that potential applications to evolutionary psychology more broadly also merit consideration.

Practical Implications

The practical implications of this meta-analytic review are particularly important to advertisers. Overall, we suggest that advertising in violent media may not be an effective strategy. Brands advertised in violent contexts will be remembered less often, evaluated less favorably, and less likely to be purchased than brands advertised in nonviolent media. Although meta-analytic effects were not significant, we also suggest that advertising in sexual media may not be as detrimental as advertising in violent media, but does not appear to be a successful strategy either.

Skeptics of our overall suggestion that advertising in violent or sexual media may not be an effective strategy may argue that violent and sexual TV programs, video games, and films often draw large audiences and, thus, the sheer exposure of a large audience outweighs the potential drawbacks. However, related research shows that advertising in events that draw large audiences (e.g., Super Bowl, Olympics) is susceptible to potential ineffectiveness as well (Gijsenberg, 2014; Neff, 2014). Likewise, advertisers are charged according to ratings and anticipated audience sizes, so any gains in audience size are accompanied by increases in advertising charges (see Poggi, 2014). Therefore, we suggest that advertising in violent and sexual media results in a lower ROI than advertising in nonviolent and nonsexual media, and any relative advantages of potentially larger audiences are likely nullified by additional costs.

Some advertisers have already integrated these conclusions in their media buying strategies. Two recent successful product placement campaigns notably refrained from advertising in violent or sexual video games. Gamers who saw in-game ads for President Obama during the 2008 presidential campaign were 120% more likely to feel positively about Obama and 50% more likely to consider voting for him than gamers who did not see the ads (Shields, 2012). More important, Obama's campaign advertised in nonviolent games, mainly sports games. Similarly, *Gatorade* product placements in several EA Sports nonviolent video games increased sales of the product by 24% (Guzman, 2010). Internal research conducted by Wal-Mart, the largest corporation in the world, corroborates these conclusions as well. Their market research suggests that commercials perform 18% better when placed in a family friendly program than when placed in a program containing graphic sex and violence (Parents Television Council, 2013). These results dovetail with the study showing that product placement in successful films improved stock performance, but violent content impaired stock performance (Wiles & Danielova, 2009).

Limitations and Future Research

One of the greatest assets of a meta-analytic review is that it identifies gaps in the literature that need to be filled. In this review, there were several gaps. Many of these gaps were because of the relatively small number of studies on a given topic. Other gaps were because of theoretically important moderators that we could not examine. We identify these gaps below, and suggest how future research might fill these gaps.

Underlying mechanisms. One limitation of the included studies is that very few studies used methods that directly measured important mechanisms such as attention and arousal while also examining violence or sex and advertising outcomes.[7] Psychophysiological evidence that violence or sex increase arousal and in turn attention to central details would provide important support for the underlying mechanisms of our theoretical framework.

Despite the lack of studies that used psychophysiological measures and met our inclusion criteria, we can cautiously infer some support for our theoretical framework from similar studies that measured physiological responses. For example, there are positive relationships between violent images in films and video games and physiological arousal (Jeong, Bohil, & Biocca, 2011; Reeves, Lang, Kim, & Tatar, 1999). There are also positive relationships between sexual images in print advertising and films and physiological arousal (Belch, Holgerson, Belch, & Koppman, 1981; Reeves et al., 1999). There are also positive relationships between violent and sexual film clips and attention (Reeves et al., 1999).

Taken together, these studies provide some support that violence and sex influence the underlying mechanisms of attention and arousal. However, we present this evidence with the caveat that any piecemeal combination of several isolated studies to provide support for multiple components of a theoretical framework should be interpreted cautiously. The best way to test the underlying mechanisms of the theoretical framework is to examine violence or sex, arousal, attention, and advertising outcomes together in one design. We hope that the findings we present here will spawn such research.

Explicit versus implicit measures. Memory, attitudes, and intentions are only some potential antecedents of consumer behavior. Of course the most valuable measure is purchase behavior, which is difficult to measure while also controlling media exposure. Absent purchase behavior we are left with measures that are easier to collect in laboratory experiments. These measures are susceptible to potential error as any self-report measure is (Nisbett & Wilson, 1977). Likewise, these measures provide a useful but incomplete description of the process that occurs upstream from purchase behavior in that they only account for explicit memory, explicit attitudes, and explicit intentions. There is a possibility that implicit measures may differ from explicit measures (see Schacter, 1987).

In an advertising context, a participant may be exposed to a brand that he or she may not consciously recall or recognize, but implicit memory for the brand may still change. A participant may also demonstrate different implicit attitudes toward an advertised brand than when explicitly asked opinions of the brand. In fact, there is evidence that advertising contexts influence implicit and explicit brand memory differently. One study found that explicit memory for product placements only improved for products important to the plot, but implicit memory for the same products improved regardless of plot importance (Yang & Roskos-Ewoldsen, 2007). Another study found that positive valence statements presented with brands improved explicit product choice, but valence had no effect on implicit product choice (Butler & Berry, 2002).

Among studies included in the review, there was only one study that examined implicit memory (Berger, 2012) and one study that examined implicit attitudes (Waiguny, Nelson, & Marko, 2013). Therefore, we were not able to examine explicit versus implicit measures as a moderator. However, neither study demonstrated the expected dissociations between explicit memory and implicit memory or attitudes. Nonetheless, we suggest that future research should include implicit measures. Implicit measures would be especially valuable for the evolution and emotional arousal frame-

[7] Among the two studies that directly measured mechanisms and met our inclusion criteria, there were significant problems. One study used blood pressure as an indicator of arousal (Bushman, 1998). There are important methodological and design issues associated with blood pressure (Stern, Ray, & Quigley, 2001). The other study had problems with eye-tracking software resulting in only 13 valid observations (Melzer, Bushman, & Hofmann, 2008).

work because implicit measures require less conscious awareness and evolution suggests that survival and reproduction influence human affect, cognition, and behavior often without conscious awareness. Therefore, it can even be argued that implicit measures would map on better to the proposed mechanisms of our theoretical framework than the more readily available explicit measures that are included in this review.

Violent ads. In terms of included studies, one gap is the relatively small number of studies examining the effects of violent ads on memory ($k = 3$), brand attitudes ($k = 1$), and buying intentions ($k = 5$). This is not surprising because researchers have only been addressing violent ads since 2005 (Gunter et al., 2005). Although our results suggest that, in general, the effects of violent ads are similar to effects of sexual ads, violence and sex are qualitatively different. Ongoing research in our laboratory is currently examining violent ads to either strengthen theoretical conclusions or reveal potential boundary conditions.

Sexual media. There were also relatively few studies examining the effects of sexual media on brand attitudes ($k = 1$) and buying intentions ($k = 3$). This is not surprising because only within the last 15 years have researchers examined the effects of sexual media on brand memory, but most studies have not examined brand attitudes or buying intentions (e.g., Bushman & Bonacci, 2002; Furnham & Mainaud, 2011; Parker & Furnham, 2007). As noted in the advertising process model, brand attitudes and buying intentions are crucial antecedents to purchasing behavior (Shimp & Gresham, 1983). We recommend that future research examine the effects of sexual media on brand attitudes and buying intentions. Examining such effects would strengthen theoretical conclusions and reveal potential boundary conditions.

Program/advertisement congruity. There were not enough studies to examine the effects of congruity on brand attitudes, so additional research on that outcome is needed. Likewise, the congruity priming hypothesis was supported for brand memory and buying intentions, but meta-analytic samples were small for brand memory ($k = 8$) and especially for buying intentions ($k = 4$). Although we could detect significant effect sizes, additional research is needed.

Previous research has also supported the cognitive interference hypothesis suggesting that program/advertisement congruity impairs advertising effectiveness (e.g., Furnham & Goh, 2014; Furnham et al., 2002). Some studies supporting the cognitive interference hypothesis did not meet our inclusion criteria because they did not examine sex or violence in media or ads (Furnham & Goh, 2014; Furnham & Price, 2006).

Considering the conflicting results of previous studies and the potential skew of studies included in this review, we suggest that future research examine program/advertisement congruity from a more detailed perspective. Researchers have suggested that variables such as involvement (e.g., Bushman, 2007), erotophobia/erotophilia (e.g., Furnham & Hiranandani, 2009), and brand familiarity (e.g., Waiguny et al., 2013) moderate potential congruity effects. Further research should strengthen theoretical implications and reveal potential boundary conditions for these and other potential contingencies of congruity effects.

Product placement. Although we did not have enough studies to distinguish between product placement research (e.g., Yoo & Peña, 2011) and traditional commercial break research (e.g., Shen, 2001), our theoretical framework suggests that memory impairments should also apply to product placement. Examining our theoretical propositions in product placement contexts is increasingly important as advertisers use product placement more often. One study suggested that violent content undermined otherwise beneficial effects of product placement in popular movies on stock performance (Wiles & Danielova, 2009). Another study examined congruity in product placement contexts and found that when products are congruent with the games in which they are advertised (e.g., Kingsford Charcoal advertised in the hamburger grilling advergame "Sure Fire Flipper,"), brand memory improves (Peters & Leshner, 2013). Future research should examine whether effects in product placement contexts are diminished from, consistent with, or greater than the effects demonstrated in this review, as well as potential moderators of those effects.

Culture. Another important limitation is that we were not able to determine whether cultural differences moderate any of the effects observed in the analyses. All included studies were from Western cultures: United States (34 studies), England (4 studies), Canada (3 studies), France (2 studies), and Germany (1 study). There were not enough studies from non-U.S. countries to test any cultural difference hypotheses.

It is possible that cultural differences may moderate observed effects. For example, the effects of sexual media may differ between more sexually liberal countries (e.g., France) and more sexually conservative countries (e.g., Turkey). Previous research in Turkey found a large effect ($d = -0.81$) of sexual media exposure on memory impairment for foreign languages (Lull, Çetin, & Bushman, 2015). It is possible that sexual content considered mild in liberal countries might be considered shocking in countries that strictly regulate such content. Therefore, decreases in memory, attitudes, and intentions may be exacerbated in sexually conservative countries compared with sexually liberal countries.

Another possibility is that cultural differences regarding acceptable amounts and types of violence may also moderate some of the observed effects. For example, popular films have been banned in countries as socially diverse as Vietnam, Germany, and New Zealand (Turow, 2014). Similar to the content intensity hypotheses regarding sexual ads, we would expect increasingly violent content to attract greater attention in countries with stricter standards regarding media violence. Therefore, it is possible that decreases in memory, attitudes, and intentions may be exacerbated in such countries.

However, it is also possible that no cultural differences would emerge. For example, other meta-analytic reviews have found no differences between Western and Eastern cultures in violent media effects on different dependent variables, such as aggressive thoughts, angry feelings, physiological arousal, aggressive behavior, empathic feelings, and prosocial behavior (Anderson et al., 2010). Given both possibilities, future research should examine cultural differences to determine the potential moderating role of culture on the demonstrated meta-analytic effects.

Conclusion

It seems that advertisers are beginning to understand that advertising in violent and sexual media is not always an advisable strategy. This review provides empirical and theoretical support for that conclusion. Although Gene Baylos joked about the amount

of sex and violence on TV, for advertisers it is no laughing matter. Over 50 studies conducted over several decades using various methodologies suggest that programs featuring violence and sex do not provide the ideal context for effective advertising, and that strategies for advertising in such contexts need to consider program/advertisement congruity, ad content intensity, and the demographics of target audiences.

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*References marked with an asterisk indicate studies included in the meta-analysis.

†References marked with a dagger indicate unpublished studies included in the meta-analysis.

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Appendix A

Details for TV, Film, and Video Game Ratings

We compiled a list of Nielsen's 20 highest-rated programs in the United States for each of the past five TV seasons (2009–10 through 2013–14). Among these 100 programs, the Federal Communications Commission (FCC) rated 39% TV-14 (ages 14+) or TV-MA (ages 17+) for violent content, and rated 42% TV-14 or TV-MA for sexual content (Andreeva, 2010, 2011, 2012; Deadline Team, 2014; Patten, 2013; Parents Television Council, n.d.). We also compiled a list of the 20 top-grossing films in the United States for the same time period. Among these 100 films, the Motion Picture Association of America (MPAA) rated 55% PG-13 (ages 13+) or R (ages 17+) for intense violence, and rated 23% PG-13 or R for sexual content (Box Office Mojo, 2010, 2011, 2012, 2013, 2014; Internet Movie Database, n.d.). Finally, we compiled a list of the 10 top-selling video games in the United States for each year from 2010–14. Among these 50 games, the Entertainment Software Rating Board (ESRB) rated 54% T (ages 13+) or M (ages 14+) for violent content and rated 8% M for sexual content (Entertainment Software Rating Board, n.d.; Haywald, 2014; Kain, 2015; Pham, 2011; Savitz, 2012; Tassi, 2013).

Appendix B

Stimuli Details for Each Study

Source	Media content stimuli	Ad content stimuli
Alexander and Judd (1978)		15 fake print ads **Very sexual condition 1:** Full frontal female nudity **Very sexual condition 2:** Face and breasts **Medium sexy condition:** Side view of face, breasts, buttocks, and legs **Control condition:** Nonsexual pastoral scene **Length:** Two viewings: 15 seconds, 8 seconds
Bello, Pitts, and Etzel (1983)	One scene from TV program *Vega$* **Sexual condition:** Scene of female removing clothing **Control condition:** Dramatic scene of questioning a crime suspect **Length:** 11 minutes	One commercial **Brand:** Calvin Klein Jeans **Sexual condition:** Suggestive 1980 Brooke Shields commercial **Control condition:** Less suggestive 1981 Brooke Shields commercial **Length:** 30 seconds
Berger (2012)	Compilation of scenes from several films **Violent condition:** Compilation of violent scenes from *Killers, Inside Man, The International, The Island, Red, Shaun of the Dead, Losers, Minority Report, Ransom,* and *Salt* **Control condition:** Compilation of nonviolent scenes from the above films **Length:** Individual scenes ranged from 1.14 minutes to 3.27 minutes	Assortment of products placed in the film clip **Brands:** Ford, Volvo, Sprint, Juicy Fruit, Pepsi, Blackberry, Amtrak, MSN, GMC, Corona, Grolsch, Diet Coke, Tropical, Hummer, Kawasaki, Gap, Mack, Oscar Mayer, U-Haul, Fox **Length:** Varies
Bryant and Comisky (1978)	One scene from TV program *Banacek* **Violent condition:** Battle between hero and two villains **Control condition:** Blue screen with no sound **Length:** 15 minutes	One commercial **Brand:** Hamm's Beer **Length:** 1 minute
Bushman (1998) Study 1	One film scene **Violent condition:** Fighting in a karate tournament from *Karate Kid III* **Control condition:** Scientist observing gorillas from *Gorillas* in the *Mist* **Length:** 15 minutes	Two commercial breaks **Brands:** Krazy Glue, Wisk **Length:** 30 seconds per ad, 1 ad per break
Bushman (1998) Study 2	Same as Bushman (1998) Study 1	Same as Bushman (1998) Study 1

(*Appendices continue*)

Appendix B (*continued*)

Source	Media content stimuli	Ad content stimuli
Bushman (1998) Study 3	One film scene **Violent condition:** Selected from *Cobra, Die Hard, Single White Female,* or *The Hand that Rocks the Cradle* **Control condition:** Selected from *Awakenings, Chariots of Fire, Field of Dreams, or Never Cry Wolf* **Length:** No length given	Two commercial breaks **Brands:** Kraz Glue Plax **Length:** 30 seconds per ad, 1 ad per break
Bushman (2005)	One TV program **Violent condition:** Selected from *24, Cops,Protect and Serve, Terror on the Job, Tour of Duty,* or *X-Files* **Sexual condition:** Selected from *Ally McBeal, Howard Stern, Man Show, Sex and the City, Wild on E,* or *Will and Grace* **Violent and sexual condition:** Selected from *Angel, Buffy the Vampire Slayer, CSI Miami, NYPD Blue, South Park,* or *WWE Raw* **Control condition:** Selected from *A Dating Story, America's Funniest Animals, Hollywood Beyond the Stars, It's a Miracle, Miracle Pets,* or *Trading Spaces* **Length:** No length given	Three commercial breaks **Brands:** Body Fantasies, Dermoplast, Ferraro Raffaello Chocolates, Jose Ole, Libman Nitty Gritty Roller Mop, Mederma, Natra Taste, New Skin, Nutra Nails, Proheart 6,Senokot Natural Vegetable Laxative, Sudden Change, Undereye Lift **Length:** 30 seconds per ad, 4 ads per break
Bushman (2007)	One TV program **Violent condition:** Selected from *La Femme Nikita, Martial Law, Toughman, WWF Monday Night Nitro, Tour of Duty,* or *Millennium* **Sexual condition:** Selected from *Strip Poker, X-Show, Howard Stern, Son of the Beach, Man Show,* or *Strip Mall* **Control condition:** Selected from *Encounters with Unexplained, It's a Miracle, Mysterious Ways, Miracle Pets, Candid Camera,* or *Doc* **Length:** 40–45 minutes	Three commercial breaks **Brands:** 1-800-COLLECT, Budweiser, Levi's, M&M's, Mountain Dew, Nike, Pepsi, Pringles, Snickers **Violent condition:** Violent ad for each of the above brands **Sexual condition:** Sexual ad for each of the above brands **Control condition:** Nonviolent and nonsexy ad for each of the above brands **Length:** No length given, 3 ads per break
Bushman and Bonacci (2002)	Same as Bushman (2007)	Three commercial breaks **Brands:** Products with broad appeal (e.g., soft drinks, snacks, cereal, laundry detergent **Length:** No length given, 3 commercials per break
Chestnut, LaChance, and Lubitz (1977)		50 print ads **Sexual condition:** Decorative female models **Control condition:** Product pictures **Length:** 15 seconds per ad
Dudley (1999)		One fake print ad for suntan lotion "Polynesian Perfection" **Sexual conditions:** Selected from female model in one-piece swimsuit, topless female model, or nude model **Control condition:** Product only **Length:** Length not given
Ferguson et al. (2010)	One TV program **Violent condition:** Selected from *X-Files, 24,* or *Band of Brothers* **Sexual condition:** Selected from *Sex and the City, Will and Grace,* or *Stacked* **Violent and sexual condition:** Selected from *CSI: Miami, Buffy the Vampire Slayer,* or *VIP* **Control condition:** Selected from *Seventh Heaven, Boy Meets World,* or *Raven* **Length:** 1 hour	Three commercial breaks **Violent condition:** Nike, Reebok, John West Salmon, Federal Express **Sexual condition:** Victoria's Secret, Bud Light, Axe, Microsoft Office XP **Control conditions** Pizza Hut, Pepsi, Pentium 4, ESPN **Length:** No length given, 4 ads per break

(*Appendices continue*)

Appendix B (*continued*)

Source	Media content stimuli	Ad content stimuli
Fried and Johanson (2008) Study 1	Compilation of scenes selected from film *True Romance* **Violent condition:** Compilation of violent scenes **Sexual condition:** Compilation of sexual scenes **Violent and sexual condition:** Compilation of violent and sexual scenes **Control condition:** Compilation of scenes featuring neither violence nor sex **Length:** 39 minutes	Two commercial breaks **Brands:** Nationally available products and services with recognizable competing brands **Length:** 30 seconds (4 ads), 15 seconds (3 ads), 7 ads per break
Fried and Johanson (2008) Study 2	Compilation of scenes selected from film *Wild at Heart* **Violent condition:** Compilation of violent scenes **Sexual condition:** Compilation of sexual scenes **Violent and sexual condition:** Compilation of violent and sexual scenes **Control condition:** Compilation of scenes featuring neither violence nor sex **Length:** No length given	Same as Fried and Johanson (2008) Study 1
Fried and Johanson (2008) Study 3	Compilation of scenes selected from one TV program **Violent condition:** Selected from Cops or *Law & Order* **Sexual condition:** Selected from *Sex and the City* or *Reno 911* **Control condition:** Selected from *Unsolved Mysteries, Judging Amy, Sex and the City, Reno 911, Cops,* or *Law & Order* **Length:** No length given	Two commercial breaks **Brands:** Nationally available products and services with recognizable competing brands **Length:** 30 seconds (6 ads), 15 seconds (8 ads), 7 ads per break
Furnham and Hiranandani (2009)	One TV program **Sexual condition:** *Sex and the City* **Control condition:** *Friends* **Length:** 30 minutes	One commercial break **Brands:** Alcoholic drinks, toiletries, watches **Very sexual condition:** Many references to sex, scenes of a sexual nature and nudity **Medium sexy condition:** Some reference to sex and partial nudity **Control condition:** No sexual reference. **Length:** No length given
Furnham and Mainaud (2011)	Same as Furnham and Hiranandani (2009)	One commercial break **Brands:** Bouygues Telecom, Peugeot, Dolce & Gabbana, Jean Paul Gaultier, Dim, Mars, Twix **Sexual condition:** Sexual ads for the above brands **Control condition:** Nonsexual ads for the above brands **Length:** No length given, 6 ads per break
Goldber and Gorn (1987) Study 1	One TV scene **Violent condition:** Killing of a young child from *Sixty Minutes* **Control condition:** Circus acts from *Real People* **Length:** No length given	Four commercial breaks **Brands:** Riunite, Heinz, Maxwell House, Tang **Length:** No length given, 1 ad per break
Goldberg and Gorn (1987) Study 2	Same as Goldberg and Gorn (1987) Study 1	Three commercial breaks **Brands:** Shell Oil, H&R Block, InterAmerica Insurance **Length:** No length given, 1 ad per break
Grazer (1981)		24 fake print ads **Brands:** Jeans, liquor **Very sexual condition:** High sexuality **Medium sexy condition:** Moderate sexuality **Control condition:** Asexual **Length:** 10 seconds per ad

(*Appendices continue*)

Appendix B (*continued*)

Source	Media content stimuli	Ad content stimuli
Gunter, Furnham, and Pappa (2005)	One film scene **Violent condition:** *Gladiator* **Control condition:** *Sleepers* **Length:** 22 minutes	One commercial break **Brands:** Chevrolet S-10, Citroen Xsara, Philips Flat Screen TV **Violent condition:** Violent Chevrolet S-10 ad **Control condition:** Nonviolent Chevrolet S-10 ad **Length:** No length given
Jones, Stanaland, and Gelb (1998)		One fake print ad **Brand:** Fitness/cross-training bicycle **Sexual condition 1:** Sexy male model **Sexual condition 2:** Sexy female model **Control condition:** Landscape **Length:** 15 seconds per ad
Judd and Alexander (1983)		18 pairs of ads **Brands:** Automotive products, household goods, jewelry, sporting goods **Very sexual condition:** Full frontal female nudity **Medium sexy condition:** Face and breasts **Control condition:** Landscape **Length:** No length given
Kennedy (1971) Study 1	One TV program **Violent condition:** Suspense thriller **Control condition:** Situation comedy **Length:** No length given	Three commercials **Brands:** Coffee, potato chips, cereal **Length:** No length given
Kennedy (1971) Study 2	Same as Kennedy (1971) Study 1	Same as Kennedy (1971) Study 1
LaTour and Henthorne (1994)		One print ad **Brand:** Well-known pair of jeans **Sexual condition:** Partially nude male and female models in a sexually suggestive embrace **Control condition:** Male and female models holding hands while walking **Length:** No length given
Lull et al. (under review) Study 1	Video game *The Getaway* **Violent condition:** Kill as many people as possible **Control condition:** Explore the city **Length:** 30 minutes	Several ads placed in the game environment **Brands:** Real brands including McDonald's, Barnes and Noble, Starbucks, Lexus, Sony **Length:** Varies
Lull et al. (under review) Study 2	Video game *Grand Theft Auto: San Andreas* **Violent condition:** Kill as many people as possible **Control condition:** Explore the city **Length:** 25 minutes	One ad placed on participants' vehicles **Brands:** Fake brands: FlowCo Fuel, Wizard Wax Car Care, Prime Peanuts, Banjo Bubble Gum **Length:** Varies
Lynn (1995)		One print ads **Brands:** University Computerized Carpool Service (fake), H. H. Brown (real), Louisiana Tourist Board (real), Chef Bentley Muffin Mixes (fake), Total Medical Care (fake) **Sexual condition:** High sexual imagery University Computerized Carpool Service ad **Control condition:** Low sexual imagery University Computerized Carpool Service ad **Length:** No length given
Mathur and Chattopadhyay (1991)	One TV or film scene **Violent condition:** Scene from the Nuremberg Trials **Control condition:** Scene from a Disney film **Length:** 7 minutes	Two commercial breaks **Brands:** McDonald's, Mutual of New York **Length:** No length given, 1 ad per break

(*Appendices continue*)

Appendix B (*continued*)

Source	Media content stimuli	Ad content stimuli
Melzer, Bushman, and Hofmann (2008)	*AdRacer* video game made specifically for research **Violent condition:** Run over pedestrians while racing a vehicle **Control condition:** Run over geometric shapes while racing a vehicle **Length:** No length given	64 logos placed in the game environment **Brands:** Corporate logos **Length:** Varies
Mundorf, Zillmann, and Drew (1991)	One news story **Violent condition:** Disturbing story about 1986 public suicide of politician Ed Dwyer **Control condition:** Story about a female bicyclist attempting to set a record **Length:** 10 minutes, 50 seconds	Three commercial breaks **Brands:** IGA, Highland, True Value **Length:** 30 seconds per ad, 1 ad per break
Murphy, Cunningham, and Wilcox (1979)	One TV program **Violent condition:** Action/adventure program **Control conditions:** Documentary, Situation Comedy **Length:** No length given	Six Clio award-winning commercials from 1971-75 **Brands:** No information given **Length:** No length given
Murry, Lastovicka, and Singh (1992)	One TV program or one film **Violent condition:** *The Day After* **Control condition:** *The Cosby Show, Cheers, Brian's Song, Words of Heart, The Iron Curtain Rises* **Length:** No length given	One commercial break **Brands:** Fast food, hair gel, electric razor, macaroni, poultry, vegetables **Length:** 30 seconds
Parker and Furnham (2007)	One TV program **Sexual condition:** *Sex and the City* **Control condition:** *Malcolm in the Middle* **Length:** 30 minutes	One commercial break **Sexual condition:** Best of R'n'B Compilation CD, Budweiser, Lynx, Herbal Essences, Bacardi, Virgin Mobile **Control condition:** New Year's Compilation CD, Fosters, LaCoste, Pantene Shampoo, Baileys, Virgin Mobile **Length:** No length given, 6 ads per break
Patzer (1980)		One fake print ad **Brand:** Body soap **Sexual condition:** Sexy model **Control condition:** Nonsexy model **Length:** No length given
Peterson and Kerin (1977)		Fake print ads **Brands:** Vade body oil, Vade wrench set **Sexual condition:** Nude female model **Medium sexy condition:** Seductive female model (unbuttoned blouse) **Control condition:** Product only, product with fully dressed female model **Length:** No length given
Prasad and Smith (1994)	One film scene from an action-adventure film **Violent condition:** Violent scene **Control condition:** Nonviolent scene **Length:** 30 minutes	One commercial **Brand:** Children's cereal **Length:** No length given
Putrevu (2008) Study 1		Two print ads **Very Sexual condition:** Red Delicious by DKNY **Control condition:** Promesse by Chanel **Length:** No length given
Putrevu (2008) Study 2		Two print ads **Sexual condition:** J.C. Penney ad for lingerie **Control condition:** Burlington Coat Factory **Length:** No length given
Reidenbach and McCleary (1983)		Same as Peterson and Kerin (1977), except with male model instead of female model

(*Appendices continue*)

Appendix B (*continued*)

Source	Media content stimuli	Ad content stimuli
Richmond and Hartman (1982)		Five print ads **Sexual condition:** Inappropriate ads for Rice Council and Great Southwest Corp. **Control condition:** Appropriate ads for Sears Ah-h Bra, Sheik contraceptives, Shalimar perfume, J & B scotch, Eve cigarettes, and Drambuie liqueur **Length:** No length given
Sabri and Obermiller (2012)		One fake print ad **Brand:** Ravage perfume **Violent condition:** Gun and gunshot wound **Sexual condition:** Two people kissing, semi-nude bondage **Control condition:** Woman looking down a ravine **Length:** No length given
Severn, Belch, and Belch (1990)		One print ad **Brand:** Travel Fox sports shoes **Sexual condition:** Nude couple in position suggesting intercourse (real) **Control condition:** Picture of shoes (fake) **Length:** 40 seconds per ad
Shen (2001)	One film scene or TV scene **Violent condition:** *Natural Born Killers* **Control condition:** *Seinfeld* **Length:** 30 minutes	Three commercial breaks **Brands:** No information given **Length:** 30 seconds per ad
Simpson, Horton, and Brown (1996)		Same as Reidenbach and McCleary (1983)
Soldow and Principe (1981)	One TV program **Violent condition:** *Baretta* **Control conditions:** *Brady Bunch*, solely commercials **Length:** No length given	One commercial break **Brands:** Food, car, and household cleaning agent **Length:** No length given
Steadman (1969)		Several fake print ads **Brands:** Well-advertised brands **Sexual condition:** Females in various stages of undress **Control condition:** Images of landscape, house, motor car, racing car, motorboat, yacht **Length:** Participants took ad booklets home for 24 hours
Waiguny, Nelson, and Marko (2013) Study 1	One advergame **Violent condition:** *Book of Deviants* **Control condition:** *Take on the Machine* **Length:** At least five minutes	Advergames **Brand:** Scion **Length:** Varies
Waiguny, Nelson, and Marko (2013) Study 2	One advergame **Violent condition:** *Glatorian Arena* **Control condition:** *Grand Prix* **Length:** At least five minutes	Advergames **Brand:** Lego **Length:** Varies
Weller, Roberts, and Neuhaus (1979)		12 fake print ads **Brands:** Playboy, Vic Tanny, Dial, L'Eggs **Sexual condition:** Women in various stages of undress posing provocatively **Control condition:** Fully dressed women posing routinely **Length:** 10-15 minutes
Yoo and Peña (2011)	One video game made specifically for research **Violent condition:** Participant wields gun and blood is on the floor **Control condition:** No guns and water is on the floor **Length:** 2 minutes	Several ads placed in the game environment **Brands:** Real Brands: Nintendo, EA, Sega, Konami **Length:** Varies

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