



Violent and sexual media impair second-language memory during encoding and retrieval



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HIGHLIGHTS

- We examine effects of violent and sexual media on foreign language memory in Turkey.
- Exposure to violent and sexual media impairs foreign language memory.
- Memory impairments occur during encoding and retrieval.

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ABSTRACT

Research suggests that exposure to media containing violence and sex impairs attention and memory. Learning a foreign language is one domain in which attention and memory are critical. Two experiments addressed whether exposure to media containing violence and sex interferes with foreign-language performance. Turkish participants ($N_{\text{Experiment 1}} = 70$, $N_{\text{Experiment 2}} = 76$) completed a foreign-language performance task before and after viewing a video. By random assignment, participants watched either a video containing violence and sex or a video containing no violence or sex. In both experiments, the two groups did not differ on pretest performance, but participants exposed to violence and sex performed worse on the posttest (Experiment 1: English; Experiment 2: Spanish), and on a delayed test one week later (Experiment 2). These results suggest that participants exposed to violence and sex allocated attentional resources to violent and sexual cues in their videos rather than to the foreign language material.

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Introduction

“Our inventions are wont to be pretty toys, which distract our attention from serious things.”

[Henry David Thoreau, *Walden* (1854, p. 57)]

When Henry David Thoreau wrote *Walden* in 1854, he cautioned against the perils of technological advances such as the telegraph, concerned that they would promote communication of petty messages and insignificant drivel at the expense of “serious things” (p. 57). Since then, technological advances have improved communication standards exponentially, but the capacity for distraction remains considerable.

Perhaps no invention's capacity for distraction is as robust as modern media. Psychologists have studied the influence of media use on attention in several domains, and the results are concerning. Television exposure between ages 1–3 has been associated with attention problems at age 7 (Christakis, Zimmerman, DiGiuseppe, & McCarty, 2004). Video game exposure has been associated with attention problems across two age ranges, 6–12 and 18–32 (Swing, Gentile, Anderson, & Walsh, 2010). A meta-analysis found associations between media use and Attention Deficit Hyperactivity Disorder (ADHD) related behaviors across 45 empirical studies, providing converging evidence among varying samples and research approaches (Nikkelen, Valkenburg, Huizinga, & Bushman, 2014).

Media exposure and memory

Memory is an important component of attention. By definition, details that are successfully attended to in an environment are integrated into working memory (Knudsen, 2007). Studies have addressed

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memory performance as a measurement of attention (Lang, 2000). It is suggested that performances on memory tests indicate the influence of attention on encoding, storage, and retrieval of stimuli. Several studies have shown that media exposure is related to memory impairments (Dworak, Schierl, Bruns, & Strüder, 2007; Zimmerman & Christakis, 2005).

A variety of explanations have been proposed to account for the relationship between media use and attention/memory problems. Some explanations propose that fast-paced scene changes in television and films condition viewers to have short and rapidly-shifting attention spans (Jensen et al., 1997; Lang, Bolls, Potter, & Kawahara, 1999; Lang, Zhou, Schwartz, Bolls, & Potter, 2000). Other explanations suggest that media use displaces time that would otherwise be spent on tasks demanding more focused attention, such as studying and learning (Christakis, 2009; Hancox, Milne, & Poulton, 2005). As a result, attention is not adequately paid to more involving tasks. Although there is some support for both of these hypotheses, most scholars agree that other factors should be considered as well (Anderson, Huston, Schmitt, Linebarger, & Wright, 2001; Borzekowski & Robinson, 2005; Zimmerman & Christakis, 2005).

Influence of violent and sexual media

Other explanations suggest that the relationship between media use and attention problems is more a function of the type of media content that one consumes than the total amount of media that one consumes (Anderson et al., 2001; Zimmerman & Christakis, 2007). One explanation suggests that violent or sexual media content can influence attention and memory (Huizinga, Nikkelen, & Valkenburg, 2013; Kronenberger et al., 2005; Zimmerman & Christakis, 2007). Research has found that recall of event details is impaired when the event is embedded in a violent context (Clifford & Scott, 1978; Loftus, Loftus, & Messo, 1987) or sexual context (Christianson, 1986; Ellis, Detterman, Runcie, McCarver, & Craig, 1971). A recent meta-analysis found that advertisements embedded in violent or sexual media content are remembered less accurately than advertisements embedded in nonviolent and nonsexual content (Lull & Bushman, 2014). Memory impairment did not differ between advertisements embedded in violent content and advertisements embedded in sexual content. This suggests that violent content and sexual content impair memory in similar ways and to a similar extent. Most theoretical explanations therefore suggest that the memory effects of violent and sexual content are comparable (see Bushman, 2005; Lull & Bushman, 2014).

It is argued that violent and sexual content attract attention away from important details (Geer, Judice, & Jackson, 1994; Lang, Newhagen, & Reeves, 1996). Violence and sex instead attract attention to themselves. Some research suggests that violence and sex are inherently arousing and emotional “central” cues that narrow attentional capacity at the expense of other “peripheral” cues (Christianson, 1984; Easterbrook, 1959; Lang et al., 1999; Mandler, 1992). Other research focuses on violence and sex as important evolutionary cues that humans are particularly attuned in order to ensure the survival and reproduction of the species (Bushman, 2005; Geer & Melton, 1997). Both explanations suggest that attentional capacity that should be devoted to important details is instead occupied by the violent and sexual content surrounding the details (see also Leichtman, Ceci, & Ornstein, 1992). Because attention is a resource with limited cognitive capacity, violent and sexual content thus contribute to memory impairments (Lang, 2000).

Emotionally arousing content and encoding

Most research suggests that memory impairments occur during encoding. More specifically, emotionally arousing content is encoded more thoroughly than neutral content when both are presented either simultaneously or consecutively (Leichtman et al., 1992). Converging neuroscience research suggests that increased amygdala activity during memory encoding of emotional events strengthens memory for emotional events relative to neutral events (Cahill et al., 1996; Dolcos &

Cabeza, 2002; Hamann, Ely, Grafton, & Kilts, 1999; LaBar & Cabeza, 2006). We suggest that exposure to violent and sexual media can be an emotional event influencing amygdala activity and subsequent encoding of violent and sexual content at the expense of encoding neutral content. We did not measure amygdala activity in the present research, but suggest that its influence on encoding emotional events relative to neutral events is a likely mechanism for our proposed effects.

Second-language learning

We propose that one type of neutral content that may be encoded less effectively than emotionally arousing content is a second language. We are particularly intrigued in second-language learning because the influence of violent and sexual content on second-language learning is an understudied but important topic. Learning a second language requires effective encoding of learned information. Therefore, influences that may undermine encoding, such as violent and sexual media exposure, should be examined.

Poor second-language performance and media exposure

Turkey is the worst performing European country on the English Proficiency Index (Education First, 2013). In Turkey, children begin to learn English at a later age than in better performing European countries, typically between ages 11 and 14 (Koru & Akesson, 2011). Interestingly, daily hours of media exposure peak during this age range in Turkey (Aral, Ceylan, & Biçakçi, 2011). Much of the media consumed in Turkey is from the United States. Well over half of television programs (e.g., Federman, 1998; Kunkel, Eyal, Finnerty, Biely, & Donnerstein, 2005; Lyons, 2013), movies, (e.g., Gunasekera, Chapman, & Campbell, 2005; Yokota & Thompson, 2000) and video games (e.g., Dill, Gentile, Richter, & Dill, 2005) contain violence, sex, or both violence and sex. Therefore, violent and sexual media exposure is likely to peak during this age range as well. Taken together, it is possible that potential peaks in violent and sexual media exposure that occur during the age range in which second-languages are studied may be partly responsible for poor second-language learning because violent and sexual media impair memory. Although we did not examine the effects of changes in violent and sexual media exposure over time on second-language learning, we designed two experiments to test the potential relationship between acute violent and sexual media exposure and second-language performance.

Overview

We conducted two experiments to replicate and extend previous research on the effects of violent and sexual media on memory to the domain of second language performance (Çetin, 2012; Çetin & Flamand, 2010). Measures of memory for both English (Experiment 1) and Spanish (Experiment 2) words were used to complement previous research that used measures of memory for German words (Çetin & Flamand, 2010) and English reading ability (Çetin, 2012) in Turkish samples. Mixed factorial designs were used to complement previous research, which only used within-subjects designs (Çetin, 2012; Çetin & Flamand, 2010). This way, we were able to compare pretest and posttest performance within groups as well as performances between the two groups.

We propose that violent and sexual content (Experiment 1) occupy limited attentional resources and (Experiment 2) contribute to memory impairments when encoding information. In Experiment 1, we propose that exposure to media containing violence and sex will occupy attentional resources, such that participants who are exposed to media containing violence and sex will perform worse on second-language verbal performance tasks compared to participants who are exposed to media containing no violence or sex. In Experiment 2, we propose that exposure to media containing violence and sex will interfere with encoding a foreign language, such that participants who are

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