

Do you hear what I hear, do you see what I see

by

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Abstract

Under the theoretical framework of the General Aggression Model (Anderson & Bushman, 2002), this study investigated the effects of watching and listening to violent rap music videos and rap audio recordings on aggressive cognitions using a mixed between-within subjects design. We hypothesize that violent content would prime aggressive cognitions regardless of media mode (song alone or music video). Additionally, an interaction between mode and content was hypothesized in which we predicted that violent music videos would have a greater effect on aggression cognitions than violent audio tracks. Aggressive cognition was measured using a word pronunciation task that recorded reaction times to violent and non-violent words. The results lend support to both hypotheses. The results are discussed with regard to the General Aggression Model. Implications for theory, as well as future directions for research are discussed.

Introduction

The music industry began to voluntarily place parental advisory labels on albums with potentially objectionable lyrics in 1985. These warning labels received the nickname “Tipper Stickers” because one of the founders of the Parents Music Resource Center, Tipper Gore, implied at congressional hearings mandatory regulation might be required if the industry did not self-regulate (Federal Trade Commission, 2000). The above lyrics are just one example of why these warnings have been placed upon many albums, and why there are parents and professionals who are concerned about the effects explicit music lyrics and their accompanying videos might have on children.

Violent content in all forms of media, from television to video games to music, have received a great amount of attention in the recent years. This is partially due to highly publicized acts of extreme violence, such as the shooting that occurred at Columbine high school in 1999, or the more recent shooting at Virginia Tech in 2007. Although a variety of factors are responsible for the culmination of such horrific events, past research has shown that consistent exposure to violent media increases arousal (Ballard & Panee, 2002), aggressive cognitions (Bushman & Anderson, 2002; Anderson, 1997), and aggressive behavior (Anderson et al., 2003, Bushman & Geen, 1990; Josephson, 1987) in both the short and long term. Aggression is defined as any behavior directed toward another individual that is carried out with the immediate intent to cause harm. Also, the aggressor must believe that the behavior will harm the target, and that the target is motivated to avoid the behavior (Bushman & Anderson 2001, Geen 2001). Violence is typically defined as aggression that has extreme physical harm as its goal. The majority of the research on violent media is concentrated within the realm of television and movies (Huesmann & Miller, 1994). This

body of research had demonstrated violence exposure yields relatively strong, reliable increases in arousal, aggressive cognitions, and aggressive behaviors. With changes in technology, public and professional concern soon shifted from violence on television to violence in interactive video games. Research on the effects of short-term exposure to violent video game play has yielded similar consistent increases in the aforementioned aggressive-related variables across numerous studies (Anderson & Bushman, 2001).

Although music is one of the oldest forms of media, the body of research pertaining to violent music and music videos and their effects on human aggression is small when compared to television and video games. Given the similarity between music videos and television, one would expect the two to produce similar effects when these videos contain violent content. It is less clear what effect listening to a violent song may have on a person's aggressive cognitions or behaviors.

Chapter I: Content of Popular Music and Music Videos

Content Analysis of Music Lyrics

When you turn on your radio to your favorite mainstream broadcaster on your morning drive to work how likely are you to be exposed to violent song lyrics? If your child likes to watch music videos are they being constantly exposed to violence? To date only one content analysis has been conducted exclusively on aggression in music lyrics. Armstrong (2001) analyzed the content of 490 'gangsta rap' songs that were produced between 1987 and 1993. It is important to note that for the purposes of his data collection, Armstrong did not count all instances of violence, but limited his attention to three serious personal offenses directed at women: assault, forcible rape, and murder, and a fourth category combining rape and murder. Twenty-two percent contained violent and misogynistic lyrics. Assault was the most frequently occurring offense (50%). Other offenses include murder (31%), rape (11%) and murder and rape combined (8%). The study did not assess frequency of violence within songs, which would be an important piece of information as songs with violent content are likely to have multiple references in each song. Armstrong also analyzed a single top selling rap album released in 2000, *The Marshall Mathers LP* by Eminem, to get an estimate of the amount of violent and misogynist lyrics in more recent 'gangsta rap'. Of the 14 songs on Eminem's album, 11 (78%) contained violence, indicating that the 22% figure found in 'gangsta rap' from 1987-1993 may considerably underestimate the amount of violence in current 'gangsta rap' music. Armstrong (2001) chose 'gangsta rap' as a focus because of the notorious reputation the genre carries for violent content. Although data on the content of lyrics from other genres of music have not been collected, other genres such as country, pop, and rock are likely to have less violent content than rap music.

Content Analyses of Music Videos

Aggressive content in music videos has also been a concern. Early content analyses of videos that aired on Music Television (MTV) revealed that violence was fairly customary of music videos in the mid 1980s. The lowest estimate of frequency of violence in music videos was reported in a content analysis by Greeson and Williams (1986). Fifteen percent of the music videos on MTV in their sample featured violence. Other content analyses from the same time period reported more frequent occurrences of violent content. Vincent et al. (1987) found violent content in 34% of the music videos from MTV in their sample. A random sample of 62 music videos that were featured on MTV were analyzed by Baxter and colleagues, with over half (53%) containing violence (Baxter, DeRiemer, Landini, Leslie, & Singletary, 1985). Soon after, Sherman and Dominick (1986) conducted an analysis of concept only videos (videos which attempt to illustrate the song in an artful manner, rather than just creating a video of an idealized performance) that were sampled from MTV, National Broadcasting Company (NBC) and Turner Broadcasting System (WTBS). The researchers reported that 57% featured some form of physical aggression. Also of note, the videos on MTV were more likely to show physical injury than the videos on WTBS or NBC.

Television channels that broadcast videos of specific genres of music began to appear across cable television in the early 1990s. Stations such as Black Entertainment Television (BET) and CMT (Country Music Television) feature rap or country music accordingly. In order to get an accurate assessment of the content of all music videos available, videos from channels other than MTV had to be included. A sample of 518 music videos across four weeks time from BET, MTV, CMT and Video Hits 1 (VH1) found that 15% featured violence (DuRant et al., 1997). Again, videos shown on MTV were more likely to feature violence

than videos on the other channels. Rap and rock videos were almost twice as likely to feature violence compared to country, adult contemporary, and rhythm and blues videos. Likewise, Tapper, Thorson, and Black (1994) found that rap videos were the most likely genre to feature violence, followed by heavy metal and pop. In another content analysis, rap videos were more likely to feature sexual grabbing and clutching than all other genres of music (Jones, 1997). This is important to consider because media violence has been shown to have an even greater effect than normal on aggressive behavior against women when the violence is paired with sexual content (Donnerstein, 1994).

The most recent content analysis sampled 1,962 videos drawn randomly to create a composite week of music video programming across BET, VH1 and MTV channels (Smith and Boyson, 2002). Fifteen percent of all videos featured violence. This includes violent lyrical content (e.g. credible threats of physical force) as well as violent visual content. Although it may seem like the amount of violence in music videos has significantly decreased, there are reasons one would expect this sample to show results similar to DuRant (1997). Many of the earlier studies that found higher instances of violence (Ex: Baxter et al., 1985; Vincent et al., 1987) sampled exclusively from videos shown on MTV, a channel more likely to feature videos with violence than other channels due to the spotlighting of rap and rock videos. Once again, videos from MTV consistently contained more violence than other music channels, with BET a close second. Accordingly, 30% of rap videos and 27% of heavy metal videos featured violence. Another possible reason that the amount of violence in music videos has decreased overall is that some of the earlier studies only looked at concept videos (Ex: Sherman & Dominick, 1986) which will overestimate the percentages because performance videos do not typically contain violence.

Chapter II: The General Aggression Model

The general aggression model (GAM) incorporates many existing mini-theories of aggression into a larger single theory. Some key theories and ideas that the GAM draws upon are particularly appropriate for research involving violent music and music videos. These theories include cognitive neoassociation theory, script theory, and social learning theory.

The idea that aggressive thoughts, emotions, and behavioral tendencies are linked together in memory is drawn from cognitive neoassociation theory. For example, the concept of a “gun” is linked to other aggression-related concepts such as “harm”, “shoot” and “kill” (Anderson et al., 1998). These concepts build up strong associations through frequent simultaneous activation. When a concept is primed or activated, this activation spreads to related concepts and also increases their activation. It is theorized that individuals who listen to ‘gangsta’ rap music could build up strong associations between concepts such as ‘gang,’ ‘turf,’ ‘gun,’ and ‘drive by (shootings)’.

The GAM also incorporates social learning theory (Bandura, 2001). Social learning theory maintains that an individual’s acquisition of aggressive behaviors can be developed from either direct experience or by observing others. If violence is frequently used as the solution to conflict in music and music videos, regular listeners may learn to use violent behaviors when they are confronted with conflict in their own lives.

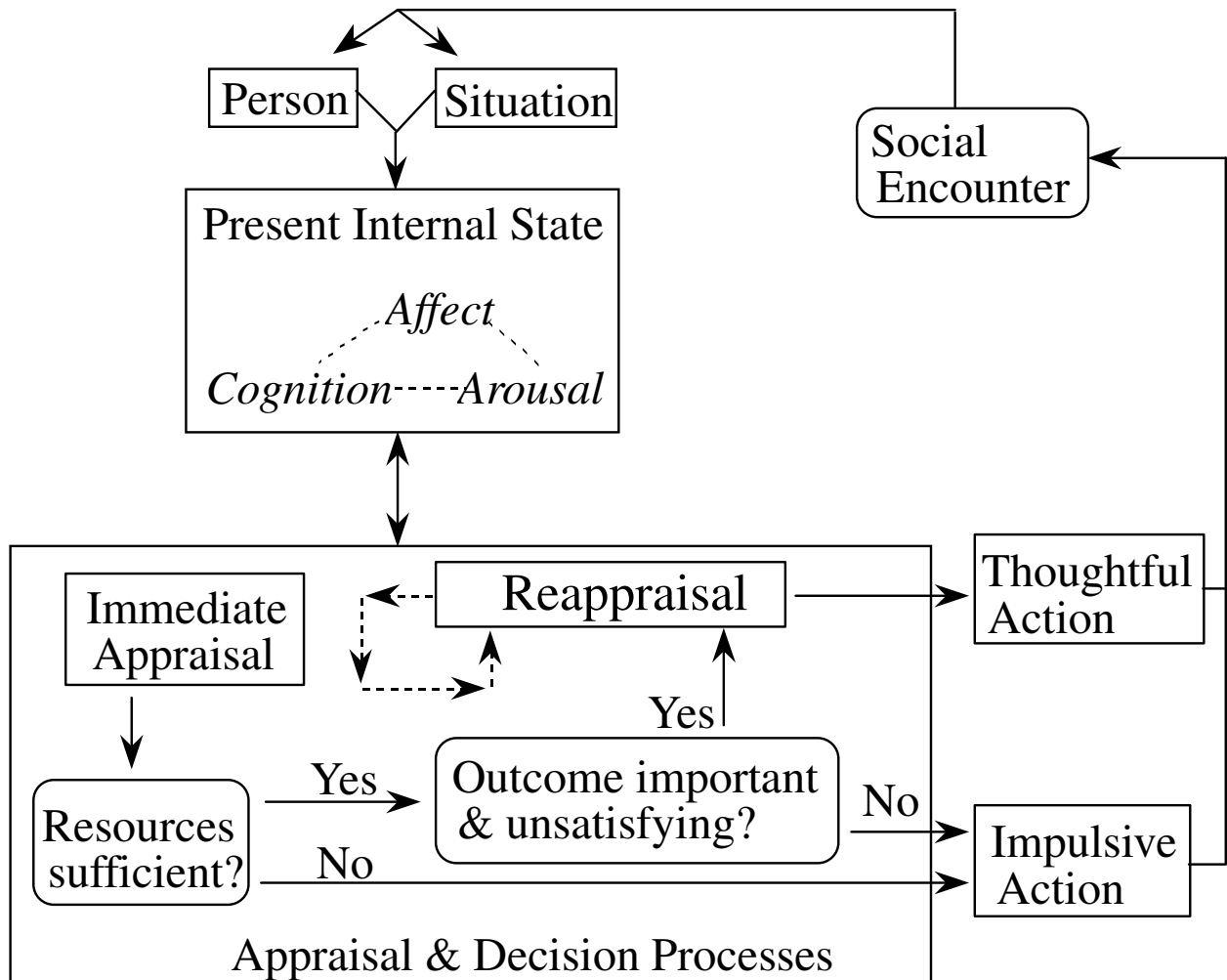
Script theory is related to both of the aforementioned theories. Scripts are sets of especially well-rehearsed, highly associated concepts in memory (Abelson, 1981). It has been proposed that when children observe violence in media, they learn aggressive scripts (Huesmann, 1986). Once a script has been learned, it can be accessed in a later situation and

used as a guide for behavior. The same songs and videos are often broadcast multiple times a day for months, providing the listener the possibility for repeated exposure and the opportunity for aggressive scripts to form.

The GAM focuses on the “person in the situation,” called an episode. This consists of one cycle of an ongoing social interaction.

Figure 1.

General Aggression Model proximate causes and processes: The episodic cycle.



There are three main parts to the model: 1) person and situation inputs; 2) cognitive, affective, and arousal routes through which the input variables have their impact; and 3) outcomes of the underlying appraisal and decision processes (Anderson & Bushman 2002). Person inputs are composed of all the characteristics a person brings to the situation. These include personality traits, attitudes, beliefs, values, and genetic predispositions. Situational inputs are composed of the important elements of the situation. Some examples are the presence of a provocation, an aggressive cue, pain and discomfort, or the use of certain drugs.

In the GAM, an individual's present internal state is composed of cognition, affect, and arousal. Aggressive cognition can be categorized into hostile thoughts and scripts. Immediate situational activation (ex: a violent music video) can increase a concept's accessibility, presumably within their neural network, for a short time. This idea is known as priming. The development of aggressive scripts also falls into this category. Affect within the GAM refers to an increase in hostile feelings in the individual. This effect has been demonstrated after watching violent rock music videos (Hansen & Hansen 1990). Similar results have been found after listening to a violent song compared to a non-violent song (Anderson et al., 2003). An increase in arousal is another internal state variable that can amplify the expression of aggression by energizing or strengthening aggressive tendencies. The final area of the GAM focuses on how the combination of all the aforementioned factors alter an individual's appraisal of the current situation, and their decision and execution of a course of action.

According to the GAM, the presence of violent content in media could cause hostile thoughts to be primed and aggressive scripts to be learned. Although there is less evidence

specific to violent music and music videos compared with other forms of media, the current body of research is generally congruent with the GAM.

Chapter 3: Previous Music and Music Video Research

Previous Music Video Research

A handful of experiments have assessed the effects of aggressive music videos on attitudes related to aggression. Greeson and Williams (1986) exposed 7th and 10th graders to a random group of videos compiled from MTV or a pre-selected montage of “high impact” videos that specifically contained sex, violence or anarchist overtones. The 10th graders who watched the high impact videos self-reported significantly higher levels of acceptance of the use of interpersonal violence. However, both conditions did contain violence, which complicates interpreting the effect. Peterson and Pfof (1989) found that males who watched non-erotic violent music videos had a significant increase in negative affect and adversarial sexual beliefs. Hansen and Hansen (1990) tested the effects of watching anti-social rock videos. Fifty-six undergraduates were instructed to watch either 3 anti-social rock videos or 3 neutral rock videos. After watching the videos they rated a confederate who either did or did not make an obscene gesture at the experimenter. The participants who saw the neutral rock videos rated the confederate less likeable, more threatening, and more irrational when he made the gesture compared to when he did not make the gesture. The participants who saw the anti-social rock videos rated the confederate the same across both conditions, suggesting a tolerance for anti-social behavior. Similarly, Abelman and Atkin (1999) found that viewers more heavily exposed to violent rap videos more likely to express greater acceptance of the use of violence. Also, Johnson, Jackson and Gatto (1995) found that African American adolescents who saw violent rap videos were more likely to condone violence in dealing with relationship problems.

Patients at a maximum-security forensic hospital were observed before and after the

removal of MTV (Waite, Hillbarnd & Foster, 1992). Patients displayed decreased behavioral problems, verbal and physical aggression. However, there was no true control group to compare the manipulation properly.

There are several correlational studies that suggest a relation between the kind of music people listen to and various detrimental behaviors. Teen heavy metal fans are more likely to engage in delinquent behaviors and to experience family conflict (Arnett 1991; Martin, Clark & Pierce, 1993). Rubin, West and Mitchell (2001) found more hostile attitudes among college students that prefer rap and heavy metal compared to students who prefer alternative, adult contemporary, dance-soul, or country. Reports of the number of real life violence experiences was positively associated with a preference for violent-oriented heavy metal and ‘gangsta rap’ among a sample 2,300 adolescents between the ages of 13 and 15 (Atkin et al., 2002). The preference for violent-oriented music was also moderately correlated with reports of verbal aggression.

Previous Music Research

The number of studies that have experimentally tested for effects of violent content due to music lyrics is less than studies targeting violence in music videos. Early studies found no effect of violent lyrical content on aggression-related variables (Ballard & Coates, 1995; Wanamaker & Reznikoff, 1989), but suffered from methodological flaws such as using songs where the lyrics were difficult to comprehend. Male undergraduates who heard either sexually violent heavy metal or Christian heavy metal were both more likely than those who listened to classical music to express negative attitudes towards women (St. Lawrence & Joyner, 1991), suggesting that the very “sound” of the music may have an effect. Other researchers have voiced similar ideas. Christenson and Roberts (1998) argued that the

“sound” of heavy metal serves to cue more aggressive schemata, and thus increase the likelihood of aggressive responses. Findings from McFarland (1984) also suggest that music type is an important variable that should be controlled for when assessing content effects of music.

The most extensive research on the influence of violent song lyrics on aggressive-related variables was a series of five experiments done by Anderson, Carnagey and Eubanks (2003). Overall, songs with violent lyrics increased feelings of hostility in all experiments when hostility was assessed. Violent songs also led to greater aggressive cognitions, which were measured in multiple ways, in all experiments it was assessed. Together, these studies provide sufficient evidence that violent lyrical content is an important variable when conducting music effects research on aggression.

Chapter IV: Overview of Current Research

No study to date has tested whether watching a violent music video or listening to a violent song have differing effect sizes on an individual's aggressive cognitions. The GAM would predict that consuming violent media, regardless of the type, will prime aggressive cognitions. However, the theory does not specify if there would be a difference in the strength of an aggressive prime based on the medium the violent content is presented through. We believe there may be differences due to two related reasons. First, music videos typically give the lyrics of the song a visual framework for interpretation for the viewer. This can best be understood using an example. Consider the follow lyrics from the song *Falling Away From Me* by a popular rock group, Korn:

Hey, I'm feeling tired. My time, is gone today.

You flirt with suicide. Sometimes, that's ok.

Do what others say. I'm here, standing hollow.

Falling away from me. Falling away from me.

Day, is here fading. That's when, I would say.

I flirt with suicide. Sometimes kill the pain.

I can always say. 'It's gonna be better tomorrow'.

Falling away from me. Falling away from me.

Beating me down. Beating me, beating me.

Down, down. Into the ground.

Screaming some sound. Beating me, beating me.

Down, down. Into the ground.

This set of lyrics could be interpreted in different ways. It is apparent there is some conflict involved, but unclear whether that conflict is internal within an individual or external between multiple people. However, the scenes in the music video recorded for this song

show an angry, drunken father advancing upon his daughter's room. Corresponding scenes show her crying and trying to hide for fear of his entry. The visual framework from the music video offers the listener a more "rigid meaning" of the lyrics. Additionally, violent music videos provide a visual representation of the target and the aggressor. An individual listening to the music alone could apply one of many representations from memory to fit and make sense of the lyrics. Consider the previous example again from the song *Falling Away From Me*. An individual watching the music video is given a rigid, clear picture that the drunken father is acting aggressively toward his daughter. Theoretically, the viewer has to spend fewer cognitive resources to understand the meaning of the song if a video is provided. Consequently, the viewer should also be more likely to process the content within a song if it is also accompanied by a video.

The purpose of the current study was to investigate the effects of watching violent music videos and listening to violent songs on individuals' aggressive cognitions. In accordance with the GAM and previous research, we predicted a main effect of violent content on the accessibility of aggressive cognitions for participants who listen to violent audio recordings as well as violent music videos. Additionally, we hypothesize there will be an interaction between the violent content and the type of media. We predict that watching a violent music video will prime aggressive cognitions at a significantly higher level in participants than listening to a non-violent video or a violent or non-violent song.

Chapter V: Method

Participants

Seventy-seven males and seventy-six females from a large Midwestern university participated in this study. Participants were recruited from the psychology participant pool, and received extra credit for their participation. The study was reviewed and approved by the university's institutional review board, and all participants were treated in accordance with APA guidelines.

Experimental Design

The design is a 2 (violent content, non-violent content) X 2 (music video, music only) X 2 (time 1, time 2) mixed between-within subjects design. A single style of music was selected to prevent potential genre effects. Songs and videos from two rap music artists were used to increase the ability to generalize results. Each artist had a violent and non-violent song that also had an accompanying violent and non-violent music video to that song. Each song was similar in length and had lyrics that are understandable. Every participant was exposed to a music video and an audio recording (without video) in each session. Each participant was also exposed to one violent and one non-violent stimulus in their session. The rap artist remained the same across each individual session. The order of the type of media and the violent content was randomized.

The first set of songs and videos that were used are by the artist 50 Cent: “Many Men Wish Death Upon Me” (violent; 50 Cent, from the album *Get Rich or Die Trying*) and “Candy Shop” (non-violent; 50 Cent, from the album *The Massacre*). The second set of songs and videos that were used are performed by the artist Nas: “One Mic” (violent; Nas, from the album *Stillmatic*) and “I Can” (non-violent; Nas, from the album *God’s Son*). Each

song is rap in style and range from three and a half to four and a half minutes in length.

Procedure

Participants first read and signed the consent form. In order to hide the true purpose of the experiment participants were told that the purpose of the study was to investigate the relationship between music and language.

The participants then either listened to a song without accompanying video or watched a music video. The videos were of equal length with their corresponding songs. The song or the video was either violent or non-violent. A lyric sheet was provided for participants while they listened to the song only. If the participant watched a music video, they were asked to read the lyric sheet that corresponded to the song used in the video before watching the video. The participants also kept the lyric sheet in case they wanted to refer to it while watching the video.

Next, participants were given a word pronunciation task to complete. Participants were instructed to read words out loud as they appear on a computer screen, one per trial. A sound-activated voice key recorded the latency between the word presentation and the point in time that participants name the word. The task was created in HyperCard 2.1 (Apple Computer, 1987–1999); the timer was triggered by a MacRecorder on a Macintosh computer. Fifty-four words were presented twice, for a total of 108 trials. A different random order was used for each participant. The word list consisted of 18 aggressive words (e.g., *assault*, *choke*), 18 escape words (e.g., *abandon*, *desert*), and 18 control words (e.g., *behold*, *listen*). The escape words have been considered control words on the basis of previous studies (e.g., Anderson, 1997), and would be combined with the control words if they were not significantly different from them. This task is appropriate as the dependent variable of the

current study because it has been used in similar experiments in the past (Anderson et al., 2003) as a measure of accessibility of aggressive thoughts. Additionally, if any participants become suspicious about the study, it is unlikely to affect the responses (Anderson, 1997). Participants are instructed to read the words as quickly as possible and cannot speed up responses faster than they are asked to do. Selective delaying of responses to certain words can be easily discovered. Participants then rated the song they just listened to or the video they just watched on a variety of different dimensions such as violence, and excitement. How much the participant liked the genre, song, and artist were also assessed.

Next, participants completed a filler task to allow time for the prime of the first music stimulus to dissipate. Participants were given a news article to read from the Iowa State Daily about cloning animals. They were then asked to write an essay evaluating the article. After 10 minutes of writing, the essay was collected.

The participants received a second music stimulus. The stimulus was always the opposite content and mode of what they received at time 1. For example, if the participant listened to a violent song at time 1, they watched a non-violent music video at time2. The music artist remained the same across time 1 and time 2. After the second music stimulus, the participant completed the same word pronunciation task again. The order that the words were presented in was again randomized. Participants also filled out another video/song evaluation for their time 2 stimulus.

The participant completed a battery of questions related to their media habits concerning TV, movies, video games, and music. The questionnaire also included some basic demographic items such as race and sex. Participants also completed Buss and Perry's Aggression Questionnaire (Buss & Perry, 1992), which measures trait aggressiveness through

four sub-scales that represent four distinct sub-traits: Physical aggression, verbal aggression, anger, and hostility. These measures were assessed after the manipulation because the type of questions asked could arouse suspicion about the true purpose of the study. Also, some of the questions contained words related to aggression, and if given before the word pronunciation task, could have unintentionally primed aggressive words. Finally, research assistants went through a debriefing questionnaire with the participant to probe for suspicion. The participant was then fully debriefed about the true purpose of the study, and asked not to tell their peers about the true purpose of the study.

Chapter VI: Results

Preliminary Analyses

The distribution of all reaction times for the word pronunciation task was examined to identify high and low cutoff points for individual trials using Tukey's (1977) methods. This method involves taking the interquartile range, multiplying it by 1.5, and adding that amount to the 75th percentile and subtracting from the 25th percentile. Reaction time scores that fell outside of this range were considered invalid trials. Reaction times quicker than 361ms were thought to be a result of accidental noise that triggered the voice key. Reaction times longer than 905ms were thought to be the result of inattention or a quiet response that did not trigger the voice key. This approach is standard with this measure, and the interquartile range in this study is comparable to ranges found in previous experiments using this task (Anderson 1997; Anderson, Benjamin, & Bartholow 1998).

Previous research using this task (Anderson 1997; Anderson & Carnegie 2003), have combined the control and escape words into one group. Because avoidance is one possible way to deal with an aggressive threat, reaction times to words associated with escaping may be different than unrelated control words when participants are exposed to violent stimuli. Means for control and escape words across time 1 and 2 for participants were created. Analyses revealed that participants responded to control words significantly faster than escape words, $t(1,152) = 14.02$, $p < .01$, although there was no interaction between word type and violent content at time 1 [$f(1,150) = .54$, $p = .46$], or at time 2 [$f(1,150) = 2.19$, $p = .14$]. Since the escape words were not theoretically relevant to testing our current hypotheses, but are theoretically related to aggression variables, these trials were excluded from further analyses.

Time 1 Analyses

Primes are short-term effects and thus there is reason to believe in the current study the prime from the first stimulus had sufficient time to dissipate before the second stimulus was given. However, we could not be sure there was no “carry-over” from the first stimulus. Therefore, we reasoned that reaction time data collected at time 1 provides the cleanest test of between-subjects effects.

Mean reaction times for control and aggressive words for the word pronunciation task at time 1 were calculated for participants. A reaction time difference score (RTDS) was created for each participant by subtracting the mean reaction time for aggressive words from the mean reaction time for control words. A positive RTDS means that the aggressive words were accessed faster than the control words; a negative RTDS means the opposite. The time 1 RTDS was used as the dependent variable for time 1 analyses. Sex was included as a covariate in all time 1 analyses. Men had higher RTDS scores ($m = .96$) than women ($m = -5.55$). Data on trait hostility and violent media exposure, variables that are relevant to aggression research, were collected in this study. However, they were not included as covariates because they were not significantly correlated with the RTDS. Including these variables as covariates did not change the significance of the findings. Experimental groups did not differ significantly on these individual difference variables. Artists were collapsed over conditions because there was not a significant difference in RTDS due to different rap artist, $t(1,152) = 1.66$, $p = .10$. A 2 (content) X 2 (mode) ANOVA on RTDS yielded a significant main effect of content, $f(1,148) = 4.34$, $p < .05$ (see Table 1). Participants who had watched a violent video or listened to a violent song had greater relative accessibility to aggressive words ($m = 1.14$) than participants who had watched a non-violent video or

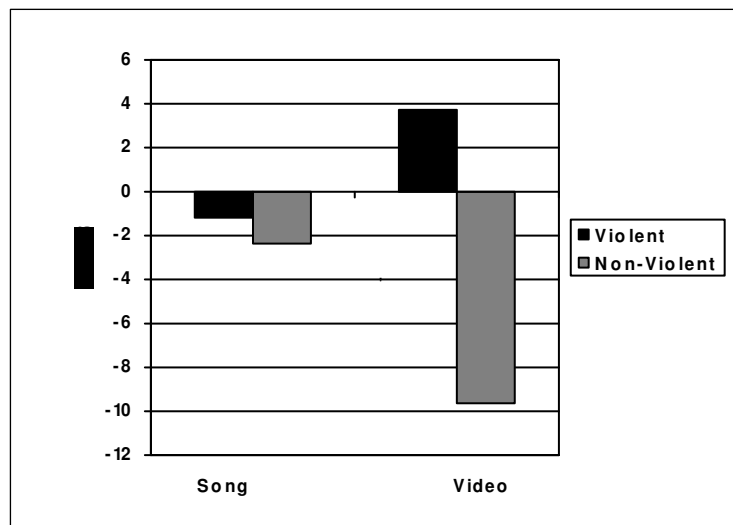
Table 1.

Analysis of variance for time 1.

Source	<i>df</i>	SS	MS	<i>F</i>	<i>p</i>
Content (C)	1	2075.9	2075.9	4.50	.04
Mode (M)	1	43.4	43.4	0.09	.76
Sex	1	1626.7	1626.7	3.52	.06
C x M	1	1451.9	1451.9	3.15	.08
Error	148	68330.4	461.7		

listened to a non-violent song ($m = -3.83$). The interaction between content and mode was marginally significant, $f(1,148) = 3.15$, $p = .08$ (Figure 2). This interaction provides some support to our hypothesis that the violent music video would prime aggressive cognitions at a greater level than listening to a non-violent video, violent song, or non-violent song.

Figure 2. Time 1 ANOVA adjusted group means for RTDS (in milliseconds).

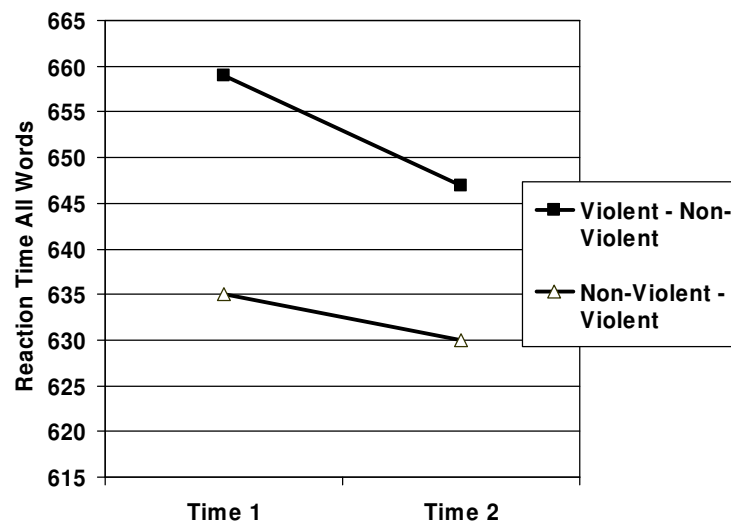


Time 1 & 2 Analyses

Average reaction times for all aggressive and control words were compared across time 1 and time 2 using a paired-samples t-test, and a significant difference was found, $t(1,152) = 3.86, p < .05$. Participants responded faster to words on average at time 2 ($m = 638\text{ms}$) than at time 1 ($m = 647\text{ms}$). Further analyses using a 2 (content order) X 2 (mode order) X 2 (time) repeated measures ANOVA revealed that the slopes from time 1 to time 2 between participants who received a violent stimulus at time 1 and participants who received a non-violent stimulus at time 1 were not significantly different, $f(1,149) = .897, p = .35$ (Figure 3), suggesting roughly equivalent practice effects across all groups.

Figure 3.

Average reaction time (in milliseconds) collapsing all word types for participants that were exposed to a violent stimulus first compared to those who were exposed to a non-violent stimulus first.



Sex was included as a covariate for time 1 and 2 analyses. Men had higher RTDS scores ($m = 1.55$) than women ($m = -4.48$). Trait hostility and violent media exposure were again not correlated with RTDS, and including them in the model as covariates does not change the significance of any findings.

Adjusted group means for RTDS were calculated for each group at time 1 and time 2 (Table 2). Violent music video means were highest at both times, and non-violent music video means were consistently low at both times.

Table 2.

Adjusted mean reaction time difference scores by experimental group split across time.

Mode	Time 1		Time 2	
	Content		Content	
	Violent	Non-violent	Violent	Non-violent
Music Video	3.71	-8.67	7.32	-4.14
Audio Recording	-1.81	-2.36	-4.91	-.54

Note: Higher means indicate quicker responses to aggressive words.

Adjusted group means for RTDS were also calculated for each group collapsed across time. The group means for RTDS in descending order were: Violent music video ($m = 5.41$), non-violent song ($m = -1.39$), violent song ($m = -3.33$), and non-violent music video ($m = -6.35$).

A 2 (content order) X 2 (mode order) X 2 (time) repeated measures ANOVA was

conducted to test for within-subject effects on RTDS (Table 3).

Table 3.

Repeated measures analysis of variance for time 1 and 2.

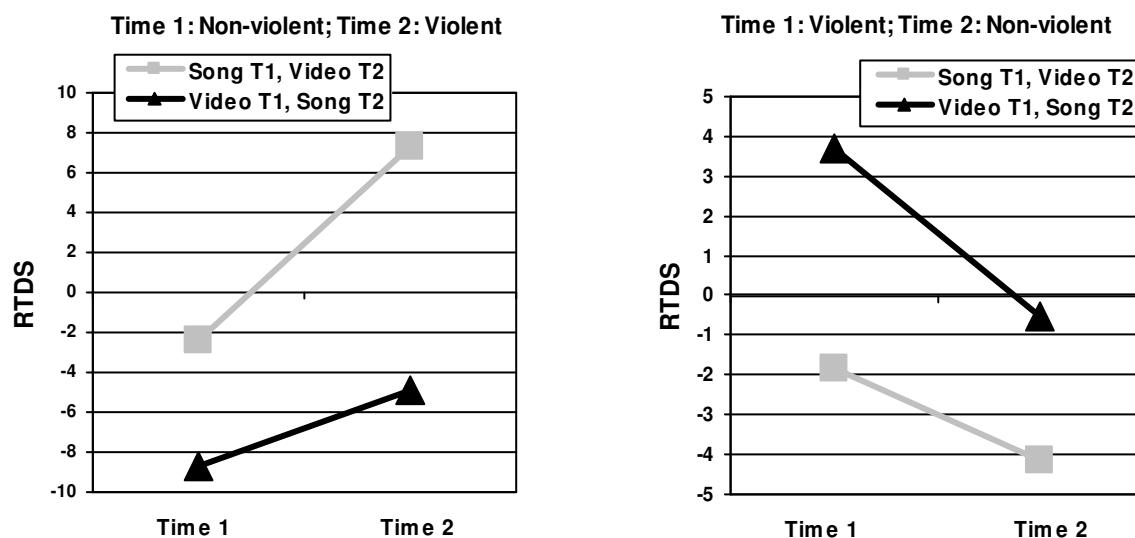
Source	<i>df</i>	SS	MS	<i>F</i>	<i>p</i>
Between Subjects					
Mode Order (MO)	1	683.6	683.6	1.39	.36
Content Order (CO)	1	412.9	412.9	0.84	.24
Sex	1	2691.6	2691.6	5.47	.02
MO x CO	1	3869.2	3869.2	7.87	<.01
Between-Subjects					
Error	148	72820.4	492.0		
Within Subjects					
Time (T)	1	237.0	237.0	0.63	.43
MO x T	1	280.2	280.2	0.75	.39
CO x T	1	1937.8	1937.8	5.16	.02
MO x CO x T	1	70.8	70.8	0.19	.67
Within-Subjects					
Error	149	55993.3	375.8		

Analyses revealed a significant interaction of content order and time, $f(1,149) = 5.16$,

$p < .05$. This interaction can be interpreted as a “main effect” of violent content, providing evidence that violent content matters through both song and video. The direction of effect can be interpreted using the slopes of lines presented in Figure 4.

Figure 4.

Adjusted means of RTDS (in milliseconds) across time 1 and time 2 for groups that differed on content order.



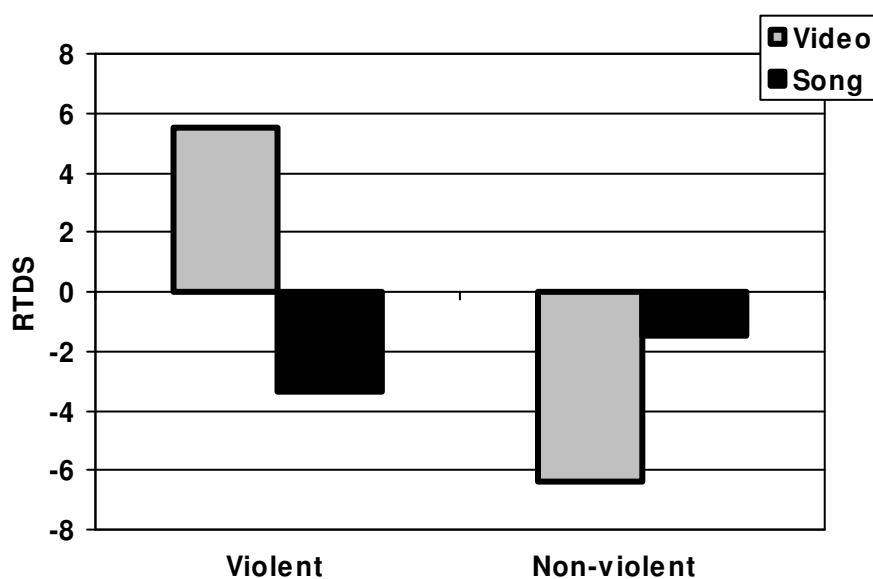
Participants who were exposed to a non-violent stimulus at time 1 and a violent stimulus at time 2 showed increased relative accessibility to aggressive words at time 2. Conversely, participants who were exposed to a violent stimulus at time 1 and a non-violent stimulus at time 2 exhibited a decreased relative accessibility to aggressive words at time 2.

The repeated measures ANOVA was also used to test for differences on RTDS between participants who watched a violent music video and listened to a non-violent song

versus participants who listened to a violent song and watched a non-violent music video. Analyses yielded a significant two way interaction of mode order and content order, $f(1,148) = 7.87$, $p < .01$. The violent video/non-violent song group exhibited greater RTDSs ($m = 2.09$) than the non-violent video/violent song group ($m = -5.04$). Although this appears at first glance to be an ambiguous contrast, the effect can be interpreted using the adjusted group means collapsed across time (Figure 5).

Figure 5.

Adjusted means of RTDS (in milliseconds) collapsed across time for groups varied on content (violent, non-violent) and mode (song, video).



Relative accessibility to aggressive cognitions was greatest in groups who had just watched a violent music video. Conversely, participants who had just watched a non-violent music video had the lowest relative accessibility to aggressive cognitions. The RTDS group

means for participants that had listened to the audio tracks show relatively little difference depending on content, and the relation is in the wrong predicted direction. Clearly, the videos are driving the observed differences in aggressive word priming between the violent video/nonviolent song group and the non-violent video/violent song group. This lends support to our hypothesis that watching a violent music video increases aggressive cognitions more than listening to a violent song. The three way interaction of mode order, content order and time was non-significant, $F(1,149) = 0.19, p = .65$, indicating that this interaction remained stable at time 1 and time 2.

The interaction between content order and time in the within subjects portion of the analysis is essentially looking at the shift in RTDS from time 1 to time 2. To supplement this data and to aid in interpretation, an artificial “baseline” ($m = -2.29$) was created by creating a grand mean RTDS of all participants at time 1, so that a similar comparison could be made for the time 1 data. The grand mean was subtracted from the RTDS for each experimental group to produce average difference scores. For the time 1 shift, there is a marginal effect of content, [$f(1,148) = 3.60, p = .058$], as well as a marginal interaction of mode and content [$f(1,148) = 3.00, p = .085$]. For time 2, RTDS at time 2 was subtracted from RTDS at time 1. The effect of content for the time 2 shift [$f(1,148) = 5.08, p < .05$] is equivalent to the previously run within-subjects ANOVA content order x time interaction. The shift from “baseline” to time 1, and from time 1 to time 2 are presented in figure 6.

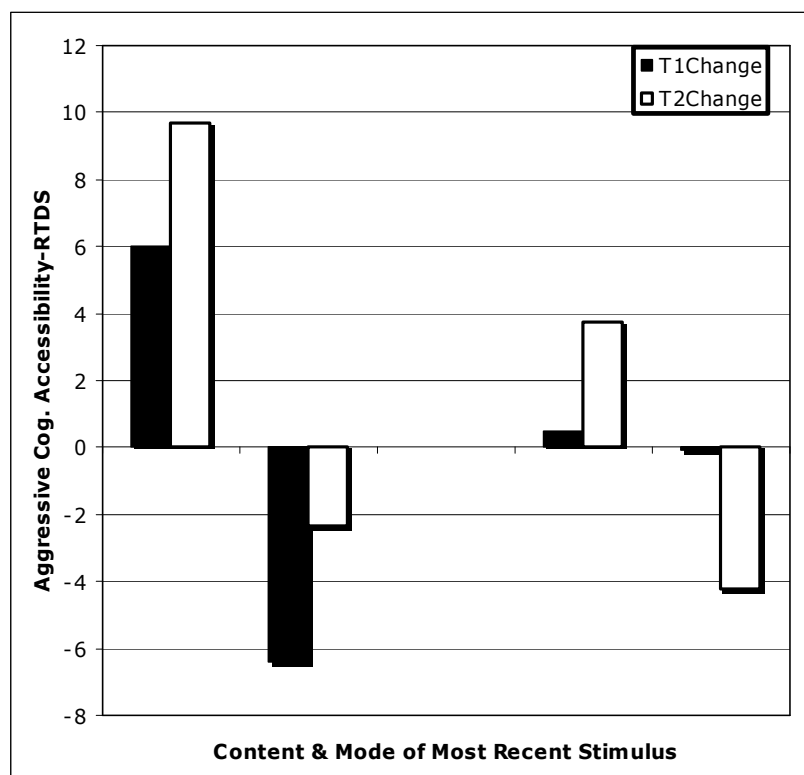
Additional Analyses

For each participant, a sum of their total number of invalid reaction time trials for control and aggressive words at both time 1 and time 2 were calculated. Eleven participants were identified as outliers in at least one word type at one of the two time points. Outliers

were defined as participants that had less than 70% valid trials in one word group at one of the two time points. Excluding these outliers reduces the main effect of aggressive content at time 1, and the time x content order within-subjects effect to marginal effects, suggesting reduced power due to sample size reduction.

Figure 6.

Change in RTDS (in milliseconds) from artificial baseline to time 1, and from time 1 to time 2.



Chapter VII: Discussion

General Overview

This study was conducted to answer research questions concerning effects on the accessibility of aggressive cognitions in individuals after watching a violent music video or listening to a violent song. Aggressive cognition was measured using a word pronunciation task. The first hypothesis was that consuming violent media of any type will prime aggressive cognitions. The results from time 1 analyses and time 2 within-subjects analyses support this hypothesis. These results are consistent with the GAM theory, previous research (Anderson et al., 2003), and the hypothesis that exposure to violent media primes aggressive cognitions.

Of particular interest are the observed differences in RTDSs when mode and content interact. We hypothesized that watching a violent music video will prime aggressive cognitions at greater level than listening to a violent song. This hypothesis was supported by analyses at time 1 and by the between subjects analyses at time 2. Although this does not contradict what is predicted by the GAM theory, different levels of effects depending on the type of input are not currently specified by the GAM.

There is, however, one apparent inconsistency between Anderson, Carnagey, and Eubanks (2003), and the current study. In contrast to the effects found in 4 of the 5 studies reported by Anderson et al., the violent song group was not significantly different from the non-violent song group at time 1, although it was in the predicted direction. Note that our within-subjects data supports that content does matter regardless of media type, suggesting that the discrepancy between this study and Anderson et al., is more apparent than real. Perhaps this is more due to smaller effects from song content rather than an inconsistency

across studies. Additional studies assessing violent content in music lyrics could provide more information to better answer this question.

Theoretical Speculation

What is it about the music videos that might account for the difference in aggressive cognitions? For example, it appears that the visual of rap artist 50 Cent getting shot has a greater impact on the cognitions of individuals than just hearing about it. This general effect could be due to one or an interaction of multiple factors. One potential explanation is that the visual violent acts presented in the music videos may be more strongly linked with the neural network associated with aggressive thoughts and concepts and supersedes any effect of only hearing the violent words through song. Another possibility is that perhaps when people watch music videos there is a cumulative effect from receiving sensory input from both the auditory and visual areas of the brain, whereas listening to the song alone only activates the auditory areas. Perhaps there are some individual difference variables such as need for cognition that result in some individuals paying less attention to the content of an audio track, but more attention when it is paired with a visual stimulus. We cannot tell from this single study which, if any, of these possible explanations are correct. Future research is needed to explore these potential explanations further.

It is also unclear from this one study whether all types of violent music and music videos would prime aggressive concepts. The current study used songs and music videos from the genre of rap music because potential musical genre effects have been suggested (St. Lawrence & Joyner, 1991; McFarland, 1984). Future research could test for effects on aggression related variables across genres. Potential effects due to genre have been suggested along two lines of reasoning. First, genres such as rap and heavy metal, as well as

some of their respective artists, have a reputation for violence. If people have existing associations between either the artist and/or genre and aggressive concepts, it is plausible that hearing any rap music could serve as an aggressive prime. Second, it has been argued that some genres such as heavy metal “sound” angry and could affect an individual's emotional state by increasing feelings of hostility (Roberts, Christenson & Gentile, 2003). This concept may be particularly important as hostile affect is an additional predictor of aggressive behavior specified by the GAM. If either or both of these speculations are valid, violent content could interact with different music genres in very interesting respects. Would an upbeat country song that talks of murder produce the same cognition effect as an equally violent gangsta rap song? If the sound of the music does indeed serve as a prime for violent concepts and/or increase feelings of hostility in people, violent country songs should show less of an effect than violent gangsta rap songs. It is also possible that the opposite would happen because violence is so rare in the genre of country music, the violent content would serve as a point of focus and result in greater aggressive cognitions than violent gangsta rap songs. This could be tested by including multiple genres in the design of future experiments.

We can also present an explanation for the results of this experiment using the theoretical framework of the GAM. Although this experiment measured aggressive cognition, the GAM specifies two additional routes that are all interconnected within a person's present internal state: Affect and arousal. It is possible that the music affected participant's aggressive cognitions, affect and arousal routes. In addition to this route, the violent images presented in the music videos may additionally affected cognitions or affect, resulting in the greater increase in aggressive cognitions relative to the violent song. Testing potential violent music and music video effects on hostile affect, other measures of

aggressive cognition, and aggressive behavior would provide further support within the theoretical framework of the GAM, as well as clarify the relations between media type and consequent effects on specific elements within the present internal state of individuals.

Limitations

This study is limited by not being a full-factorial design. Each subject only received two of the possible four experimental conditions. Although the results of this study were useful in understanding the relations between violent music videos, violent songs, and aggressive cognitions, a full-factorial design would provide additional useful data, particularly within-subjects comparisons across the same type of media differing on violent content.

Although we had defined *a priori* what constituted a valid response in terms of response time, we had not defined a minimum number of valid trials to be included. Therefore, the analyses reported here include all participants. Nonetheless, it is likely that setting a minimum number of valid trials would be appropriate. In our *post hoc* analysis, 11 participants had a limited number of valid trials in at least one word category at time 1, time 2, or both. This suggests that these participants were not paying enough attention to the task to properly follow the directions to respond as quickly as possible, or they were not speaking loud enough for the microphone to register their initial response. Removing these participants reduced the significance of the main effects of content, likely due to reduced sample size. Short-term media violence effects require a relatively large sample size to detect. We would like to drop the outliers, but run additional subjects in order to retain or increase our current sample size, which will clarify the content main effects.

Additionally, although it appears that the prime from the first media stimulus was

given sufficient time to dissipate, we cannot be sure that there was not some ‘carry over effect’ from time 1 that influenced word pronunciation reaction times at time 2. If this did occur, it should only affect participants who received an aggressive stimulus at time 1. However, if an aggressive prime from time 1 did influence time 2 dependent measures, that would reduce our ability to find an effect. Words related to aggression would still be primed, and it would have made it harder to find a within-subjects effect of violent content.

Conclusion

To date, music is the least studied type of mass media. This study begins to fill that void in the research body of violent media effects on aggression. The current study utilized a design that provided both between-subjects and within-subjects evidence that violent content in music videos increases aggressive cognitions, as well as results that partially support that listening to violent songs has similar, albeit smaller effects. Additionally, evidence across and within subjects both suggest that the content of differing types of media can have differing magnitudes of effects, and that the visual aspect of many media types may be particularly powerful.

The results of this experiment can be of use to parents, professionals, and those in the public policy domain. The results suggest that those concerned with violence in the music media domain may want to concentrate their efforts at reducing violence in music videos. Although concerned parents are advised to monitor all the media habits their children, this experiment suggests that music videos and, more generally, visual media should receive particular attention.

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