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Violent Frames: Analyzing Internet Movie Database Reviewers' Text Descriptions of Media Violence and Gender Differences from 39 Years of U.S. Action, Thriller, Crime, and Adventure Movies

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The Internet Movie Database (www.imdb.com) is the largest and most successful website for movie information, yet crowdsourced contents of sites like these have rarely been studied. Therefore, using IMDb synopsis texts, reviewers' movie descriptions were analyzed regarding movie contents that have been the subject of many previous media studies: the violent behavior and victimization of male and female film characters over time. Analysis of 1,396 synopsis texts reveals that both perpetrators and victims are mainly male (both 80%) and, against expectation, violence becomes less severe and more often nonlethal over the years. For the first time, our study using IMDb texts identifies male and female stereotypes and suggests that viewers' descriptions of what they have seen could match the findings of traditional content analyses and actual crime figures.

Keywords: fictional framing, movie violence, gender, crowdsourcing

The IMDb, an online database for audiences and written by audiences, is an important tool to find, rate, and recommend movies. It is not only the largest, but also the most popular website for movie information, cataloging more than two million films. IMDb attracts numerous movie enthusiasts who are willing to contribute their perceptions, experiences and knowledge to the database. This collaborative editing model allows for rapid growth of the content and a high level of content accuracy, due to peer reviewing and correcting. The site provides a synopsis page for every film containing a detailed description of the movie, the characters, storyline, and important events (according to viewers), often including detailed descriptions of the most memorable violent scenes and character deaths. Listed in the Top 50

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most-visited websites worldwide, IMDb is extensively used by movie viewers as an important information source in deciding what to watch.

However, the content of websites like the IMDb has rarely been studied before. Therefore, we analyzed IMDb synopsis texts focusing on movie content variables that have been the subject of many previous media studies: the violent behavior and the victimization of male and female film characters over time. Using viewers' descriptions for the first time, we examined the reported (foregrounded) gender differences and trends in the descriptions of violence in almost 40 years of movie history. Subsequently, we explored the relationships between three aspects of violence: the severity of the described violence, the types of violence, and gender roles.

Theoretical Framework

The effects of the portrayal of violence in the media on what happens in real life have been thoroughly studied. Youth appears to be especially vulnerable, becoming more aggressive when consuming media violence (Anderson et al., 2003), and this violent attitude lasts into adulthood (Huesmann et al., 2003). Therefore, it does not come as a surprise that media content has been extensively analyzed to determine violent incidents. Although many studies show similar results in the causal relation between exposure to violence in media and violent real-life behaviors, more recent studies (e.g., Ferguson & Dyck, 2012) dispute these relationships. Another field of interest related to violent media content is the one of worldview and morality. The cultivation theory indicates a relationship between memorized media violence and overestimations of real-world violence (for example, Gerbner, 1998). Not only is regular viewing important in influencing such estimations, what people remember about the images to which they are exposed may also affect their perceptions. Riddle et al. (2011) demonstrated that people who hold vivid autobiographical memories of a specific experience with media violence will overstate the prevalence of real-world crime compared to individuals without vivid memories. Furthermore, the study by Mulligan and Habel (2011), in which the theoretical concept of "fictional framing" was tested, reveals that film influences opinions in ways consistent with the framing of certain topics. Therefore, media exposure may be a factor in shaping our worldview, which may depend on how images are framed.

Many media studies have already determined that frames can be used in media content to organize complex issues in "interpretative packages," allowing the audience to understand the issues (Mulligan & Habel, 2011). However, as framing is an inherent part of people's ongoing everyday sense-making, it does not necessarily imply the intervention of the media. Hence, the audience may also constitute frames. The frames represent mental structures that facilitate organizing and interpreting incoming information by fitting it into previously learned schemata or frames about reality (Dewulf et al., 2009). As explained by Aran and Rodrigo (2013), authors such as Tulloch and Tulloch (1992), Schlesinger et al. (1998), Alasuutari (1999), Hill (2001), and Boyle (2005) demonstrated that viewers interpret media images in different ways and, consequently, are influenced by them in different ways in accordance with their attitudes, identities, or circumstances in life. Thus, both the images themselves and how they are subsequently being framed and interpreted are important. More specifically, when people are trying to interpret a situation, the definition "occurs retrospectively after people bracket their experience and assign

a particular meaning to it" (Brummans et al., 2008, p. 26). Because we cannot remember and explain everything to which we are exposed, in defining what we perceive, certain aspects of a situation are foregrounded and other aspects are not. Subsequently, these foregrounded and other aspects are given a particular label from a person's framing repertoire. Each individual uses his or her own framing repertoire to describe a situation. Thus, what viewers remember after being exposed to images depends on how the images are framed, and consequently, how a situation is framed affects how people react and behave in that particular situation.

Traditionally, research into the content of movies is performed through content analysis of the films themselves. Using a coding scheme and multiple coders, parts of or entire films are watched, coded and analyzed, and the numbers of events are compiled into a frequency table facilitating further analysis. Film contents can be analyzed this way, but this method does not reveal what viewers remember and describe, or put otherwise: how they frame what they have been exposed to. Because our study aims to discover what aspects of violence are described by viewers, an alternate means of measuring is essential. To explore viewers' perspective on movie violence and gender stereotyping, a content analysis performed by viewers may generate valuable information about the violent images that viewers remember, and about the frames that viewers use to describe to others what they saw. Descriptions provided by means of crowdsourcing are an example of such a large-scale content analysis.

In general, crowdsourcing represents efforts of anonymous groups who are willing to contribute content that combines into a relatively large or significant result, making crowdsourcing an excellent sourcing model for organizations that can use "advanced internet technologies to harness the efforts of a virtual crowd to perform specific organizational tasks" (Saxton et al., 2013, p. 3). In crowdsourcing literature (e.g., Estellés-Arolas & González-Ladrón-de-Guevara, 2012; Hammon & Hippner, 2012), multiple tasks can be identified, including problem-solving, innovation, human intelligence tasks, and collective intelligence. Recently, Saxton et al. (2013) identified nine distinct forms of crowdsourcing models. In the Knowledge Base Building Model, "the information or knowledge-generation process is outsourced to community users, and diverse types of incentive measures and quality control mechanisms are utilized to elicit quality knowledge and information that may be latent in the virtual crowd's 'brain' " (Saxton et al. 2013, p. 11), allowing others to see what is being memorized by the crowd. The application of crowdsourced information for scientific purposes is still largely an unexplored issue, but the value of this data has been confirmed by several studies. For example, consumers looking for goods and services often rely on online feedback provided by others in the form of reviews posted on online forums (Dellarocas, 2003).

Integrating framing with crowdsourcing sets the foundation for the concept of collective framing, with IMDb synopsis texts being an excellent example. Here, we consider framing as a social construction process that focuses on how situations are collectively framed. While individual frames may differ because of, for example, knowledge, skills, and experience, IMDb's collaborative editing principle facilitates collective frames made by and meant for all users. This allows us to see what is being memorized by the crowd. Furthermore, when the framing concept is transferred to media violence, an interesting question arises: What aspects of media violence are being foregrounded and described by the crowd? Contrary to previous studies in this domain, we are less interested in the violent and stereotypical content that

viewers are actually exposed to, and more focused on what images are foregrounded and remembered, which may shape viewers' descriptions of violence and gender stereotypes. More specifically, this paper aims to explore what viewers describe from the media images to which they were exposed, with a focus on the portrayal of media violence in gender-specific ways.

Portrayal of Media Violence

The frequent use of violence in the media suggests that violence must be a necessary ingredient in content that appeals to audiences, a notion that was recently illustrated by Weaver (2011), whose study demonstrated that media violence increases selective exposure (i.e., people choose to watch violent programming over other, nonviolent content). Men especially should prefer violent media more than women because of differences in upbringing (boys learning to be boys and girls learning to be girls) (Cantor, 1998), and these gender roles are reinforced through many different agents of socialization, including media images.

In addition to gender differences in preferences regarding violent media content, the way men and women are portrayed by the entertainment media tends to differ. Consistent with previously conducted content analyses about violent content in video games (Dietz, 1998), U.S. films (Eschholz & Bufkin, 2001), and television programming (Smith et al., 1998), the Bureau of Justice Statistics on Homicide Trends (U.S. Department of Justice, 2011) display a constant pattern of males being the majority in both homicide victimization and perpetration. Fewer women are victimized, because male offenders most often victimize other males. Furthermore, women turn out to be underrepresented in modern media; they are portrayed in a negative matter; they are often sexualized, and they are portrayed in stereotypical roles (Collins, 2011). A recent content analysis by Bleakley et al. (2012) involving 855 U.S. films showed that male characters are overwhelmingly the perpetrators of violence, whereas women are disproportionally involved in sexual content. Other studies have revealed the victimization of women in entertainment media during recent decades (Gilpatric, 2010; Linz & Donnerstein, 1994; Williams, 1991).

Less is known about the different types of violence that are being used by female and male characters, and about the severity of these violent acts in relation to both genders. According to U.S. homicide trend statistics (U.S. Department of Justice, 2011), homicides are being committed most frequently with firearms (in nearly 70% of all homicides; FBI Uniform Crime Reports, 2009), with other types of weapons trailing far behind (for instance, merely 13% of all homicides involve blades and knives; FBI Uniform Crime Reports, 2009). Recently, a content analysis of 945 films that sampled gun violence in films from 1985–2012, revealed that gun violence in 5-minute segments in PG-13-rated films has more than tripled and in the most recent years contained as much or more violence as R-rated films (Bushman et al., 2013). Another series of studies showed that firearms continue to be frequently shown in movies and that the consequences of firearm use, including injury or death, are rarely shown (Pelletier et al., 1999; Ramsey & Pelletier, 2004; Tongren et al., 2009). The relative share of gun violence compared to other forms of violence and the consequences is unknown. Regarding the nature and severity of the depicted movie violence, using content analysis, McArthur et al. (2000) coded 2,184 violent events depicted in films, of which 963 (44%) were lethal, 817 (37%) were moderate, and another 404 (18%)

were minimal. They found that movie violence was most often an intentional act of one character toward another and that the consequences of violent events were most often omitted.

In our study, based on the theoretical concept of fictional framing combined with the Knowledge Base Building Model, we explore the contents of movie descriptions (synopsis texts) over a 39-year period. First, descriptions of the types of violence in action movies are analyzed. Second, an overview of the severity per type of violence is provided. Third, the described violent acts portrayed by male and female movie characters are investigated. In sum, the following research question will be addressed:

RQ: What aspects of media violence are being foregrounded and described by viewers?

Method

In line with the study of Allen et al. (1997), who quantitatively examined movie genres and their proportion of crime contents using a sample of synopses for all films released in Britain between 1945 and 1991, our study focused on synopses of motion pictures in which crime plays a central role in the narrative. Such a broad, historical, and quantitative text analysis will ". . . contextualize the interpretation of detailed analyses of specific media representations of crime, and inform analyses of audience responses" (Allen et al., 1997, p. 91).

As a collaborative editing feature, the synopsis pages on IMDb allow contributors to directly add/update/edit/delete synopsis data entry for titles (IMDb, 2014). To quote the IMDb description of a movie synopsis:

> Different from Plot Outline, the new Synopsis feature is the place to add a detailed description of the entire plot of the title, including spoilers, so users who haven't seen a movie or missed an episode of a TV series can read everything about the title. A synopsis must include exclusively details of the story of the film, with no commentary. Any analysis or opinion of the film should be left out of the Synopsis page. … It is up to the viewer to decide if he/she likes it. This includes performances by actors and actresses. Please note that we (and our contributors) are still adamant and passionate about ensuring that our data remains as structured as possible and properly categorized, so if you add data here that is irrelevant, it is highly likely that other users will remove or revert it. (IMDb, 2014, Synopsis Help, para. 1)

Corpus

To help viewers discover movies they might enjoy, the IMDb search engine assigns up to five genres to each film (e.g., a film can be classified as both action and thriller). As a first step in determining the sample, a genre selection was made, aimed at including only genres with "realistic" violence, which offers a way to look at violence that a viewer might actually encounter or read about in the news. To focus on contemporary and societal relevant violence and to exclude non-realistic and less relevant violent content, the genres science fiction, fantasy, horror, animation (all representing non-realistic violence),

sport (violence is not the goal), and western (historical violence) were not included in the sample. The war genre was also excluded, because war is not a regular societal situation and war violence is perceived differently due to the involvement of political endorsement or moral overtones. The final selection was narrowed down to the following genres: action, thriller, crime, and/or adventure. Also, when two or more of these four genres were used for one movie (e.g., action *and* thriller), this movie was included, but if also one of the excluding genres co-occurred (e.g., action *and* war) the movie was excluded. Second, all movies for the four selected genres were searched, yielding 29,119 films. After filtering out duplicates, the number consisted of 8,932 movie titles with one or more of the genre labels "action," "thriller," "crime," or "adventure." Movie titles for which the descriptive text was too short to be of value for analysis (fewer than three lines of text) or nonexistent (blank) were also excluded, leaving a final sample of 1,396 American-made motion picture descriptions of valuable length, released between January 1973 and December 2011. Table 1 provides an overview of the descriptions for each year, and shows that most years in the sample have at least a 10% percent availability rate for descriptions, which is deemed acceptable for a sample size. Furthermore, the compact summarizing nature of the synopsis text should ensure a high result per word ratio. To allow for a more accurate comparison of each year, the average number of words per year and per five years was calculated. As was to be expected, the number of titles with a synopsis increases if the movie is newer, which slightly reduces the average.

Table 1. Titles Included in the Corpus.

Year of release	Total words	Number of titles in genres	Number of titles with text	Percentage of titles with text	Average words	Average words per five years[1]
2011	72,510	588	100	17%	725.1	
2010	104,617	564	102	18.1%	1,025.7	
2009	111,594	471	114	24.2%	978.9	885.4
2008	87,674	337	108	32.1%	811.8	
2007	76,856	302	117	38.7%	656.9	
2006	73,983	282	79	28%	936.5	
2005	64,566	260	58	22.3%	1,113.2	829.9
2004	35,367	222	48	21.6%	736.8	
2003	35,300	229	50	21.8%	706	
2002	41,649	237	46	19.4%	905.4	
2001	34,196	266	36	13.5%	949.9	
2000	33,568	237	34	14.4%	978.3	941.6
1999	36,411	216	37	17.1%	984.1	
1998	27,596	247	31	12.6%	890.2	
1997	37,320	256	29	11.3%	1,286.9	
1996	34,214	230	30	13%	1,140.5	
1995	21,313	235	21	8.9%	1,014.9	1,196.2
1994	26,308	231	22	9.5%	1,195.8	
1993	22,830	204	17	8.3%	1,342.9	

1992	19,423	178	19	10.7%	1,022.3	
1991	17,742	167	19	11.4%	933.8	
1990	25,929	177	24	13.6%	1,080.3	820
1989	12,550	191	20	10.5%	627.5	
1988	7,414	160	17	10.6%	436.1	
1987	16,895	144	16	11.1%	1,055.9	
1986	11,288	110	16	14.6%	705.5	
1985	20,004	103	22	21.4%	909.3	1,002.5
1984	17,189	76	16	21.1%	1,074.3	
1983	21,550	64	17	26.6%	1,267.7	
1982	11,498	62	13	21%	884.5	
1981	21,342	71	15	21.1%	1,422.8	
1980	10,306	57	10	17.5%	1,030.6	1,028.1
1979	7,482	64	9	14.1%	831.3	
1978	8,743	76	9	11.8%	971.4	
1977	10,158	83	15	18.1%	677.2	
1976	11,970	92	12	13%	997.5	
1975	8,140	92	16	17.4%	508.8	746.4
1974	13,675	113	18	15.9%	759.7	
1973	11,043	95	14	14.7%	788.8	

[1] *Due to an uneven number of years, 2008-2011 is a four-year word average.*

Coding Movie Violence and Gender

For the analyses of the movie text corpus, two coding schemes were designed: one focused on the severity and types of violence, and one focused on the victim/perpetrator designations. As such, two different codes were assigned to each description. The coding scheme for characters involved in crime was designed to be fairly straightforward. A crime has male, female or unknown perpetrator(s) and victim(s). The category for unknown perpetrators and victims consists of unspecified persons or a gender-neutral description, such as "the police officer" and "the store clerk." The codings for the types and severity of violence were based on data from the FBI Uniform Crime Reports (2009) and an exploratory blind coding of a sample of the texts. Categories were created for the types of violence found in this sample, including gun assault (e.g., handguns, machine guns, and shotguns), blade assault (e.g., knives, shards of glass, sharp sticks, and spears), physical assault (e.g., all bodily harm inflicted with body parts or hand-to-hand weapons), projectile assault (e.g., improvised projectiles such as rocks and glasses), rope assault (e.g., strangulation attacks), vehicular assault (e.g., cars, buses, and boats), chemical assault (e.g., acid, flammable substances such as gasoline, pepper spray, or toxins), environmental assault (e.g., gravity, water, or fire), explosive assault (e.g., explosives, rockets, or bombs), forced drug use (e.g., injecting someone with hard drugs), sexual assault (e.g., rape and attempted rape), and unknown assault. In addition to the type of violence, a designation for the severity was given: "light" for minor violence such as single hits and slaps, "severe" for bloody injury, "lethal" for violence with obvious or most likely lethal consequences, and "unknown," depending on the context (or lack thereof) given.

Analysis

Once this baseline for the coding was established, an exploratory analysis based on a randomized sample of all synopsis texts was conducted using the cross-sectional code and retrieve principle (Mason, 2002). The concept coding scheme was pretested using 10% of the sample (randomly selected) and, based on this test, the coding scheme was completed. This revised and final coding scheme was retested with two independent coders, who both coded 10% of the corpus. Because of the skewed nature of our categories, the inter-rater agreement was tested by means of Cohen's Kappa (Oleinik, Popova, Kirdina & Shatalova, 2014), resulting in a Cohen's Kappa coefficient of .805 (perpetrator/victim coding scheme) and .799 (type and severity of violence coding scheme). After the extended pretest described above, the entire sample of 1,396 synopsis texts was coded. Subsequently, all text was imported into the content analysis package Atlas.ti and manually coded. The 1,396 movie texts contained a total of 3,378 violent events. For each event, the type and severity of the violence was labeled, followed by a second coding on the gender of the perpetrator(s) and victim(s).

Results

Descriptions of Media Violence

The most prevalent types of violence described were violence with firearms (39.5% | *n* = 1,335) and physical violence (24.8% | *n* = 839), followed by bladed weapons (8.4% | *n* = 283). Other types of violence (13.7% | *n* = 464), such as sexual assaults or violence with chemicals, vehicles, illicit drugs, ropes, and explosives ranged from 4 to 124 counts. In the "unknown" category (13.5% | *n* = 457), no context about the violence was described (e.g., "he kills him"). Table 2 shows the prevalence of all described types of violence within our corpus, as well as the severity of those violent acts.

Table 2. Severity and Types of Violence.

	Lethal		Non-Lethal		Unknown	Total	
Gun	898	(67.3%)	437	(32.7%)	0	1,335	(39.5%)
Physical	84	(10.0%)	634	(75.6%)	121	839	(24.8%)
Blade	165	(58.3%)	106	(37.5%)	12	283	(8.4%)
Environment	91	(73.4%)	33	(26.6%)	0	124	(3.7%)
Chemical	35	(50.7%)	34	(49.3%)	0	69	(2.0%)
Explosives	63	(92.6%)	5	(7.4%)	0	68	(2.0%)
Vehicular	31	(52.5%)	28	(47.5%)	0	59	(1.7%)
Projectile	29	(55.8%)	23	(44.2%)	0	52	(1.5%)
Sexual	0	(0.0%)	49	(100.0%)	0	49	(1.5%)
Rope	39	(100.0%)	0	(0.0%)	0	39	(1.2%)
Forced drugs	1	(25.0%)	3	(75.0%)	0	4	(0.1%)
Unknown	419	(91.7%)	35	(7.7%)	3	457	(13.5%)
Total	1,855	(54.9%)	1,387	(41.1%)	136 (4.0%)	3,378	(100%)

In total, following the viewers' descriptions, 1,855 (54.9%) violent acts were lethal, 1,387 (41.1%) were nonlethal, and the severity could not be coded for 136 acts (4.0%). Of the 1,335 cases of gun-related violence, 67% (n = 898) were fatal shootings. Likewise, for blade assaults (58% | 165 out of 283), environmental violence (73% | 91 out of 124), chemical assaults (51% | 35 out of 69), explosive assaults (93% | 63 out of 68), vehicular violence (53% | 31 out of 59), projectile assaults (56% | 29 out of 52), and rope assaults (100% | all 39), most cases were lethal. Conversely, 75.6% (n = 634 out of 839) of the occurrences of physical violence were nonlethal, with only 10% (n = 84) of the cases being lethal. The same pattern occurred in sexual assaults, which were, without exception, nonlethal (49 cases), and in forced drug use, which was nonlethal in three out of the four incidents (75%). The Chi-Square test for type of violence compared to severity of violence is significant ($\chi 2$ [22, n = 3,378] = 1312,904, p < .05).

Gender Descriptions

In all of the 39 years, both victims (79.2% | n = 2,676) and perpetrators (80.0% | n = 2,704) described were male in most cases (see Figures 1 and 2). For women, the number of victims and penetrators totaled 13.1% (n = 443). The victims' gender was unclear in 7.7% (n = 259) of the cases, and unknown perpetrators totaled 6.8% (n = 231).

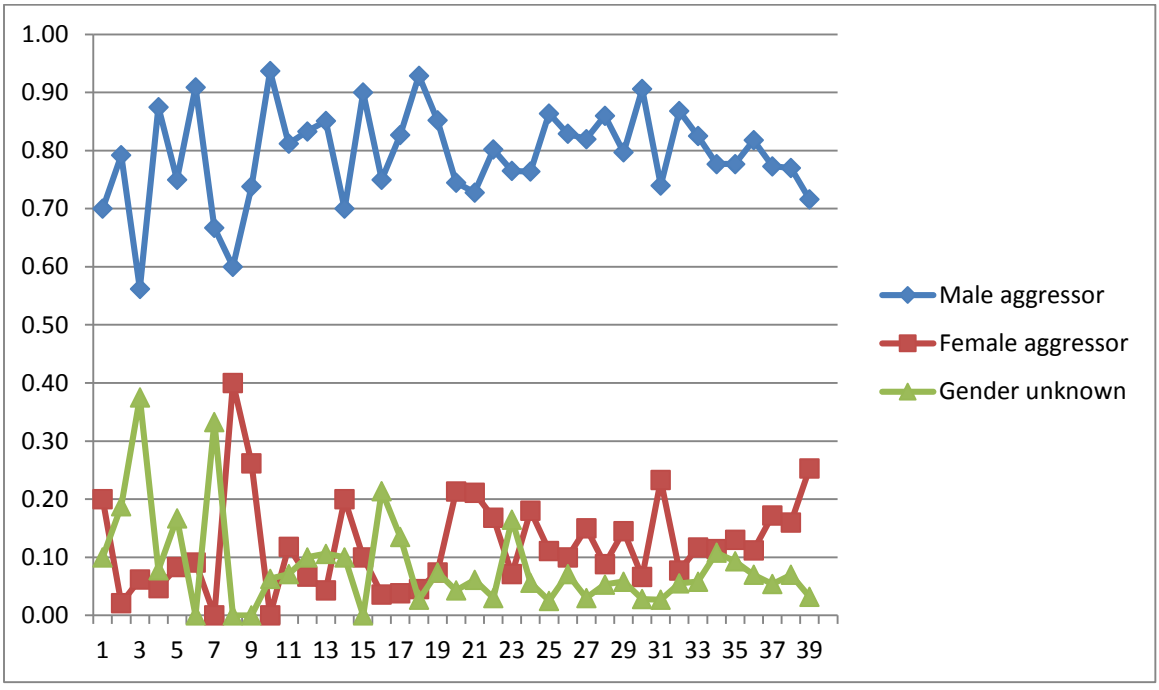

Figure 1. Aggressors' gender over the 39 years.

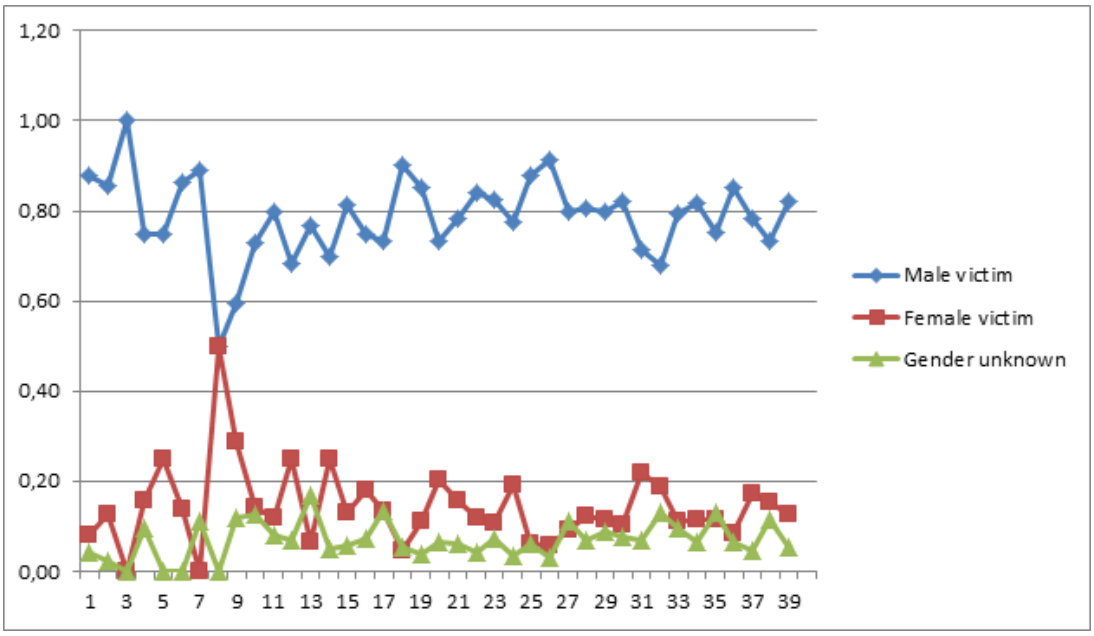

Figure 2. Victims' gender over the 39 years.

Male perpetrators were most likely to have male victims (see also Table 3), which comprised almost two-thirds of all described violent crimes (63.1% | n = 2,132). Male victims were more than six times more common than female victims (9.9% | n = 334). Female perpetrators were almost five times as likely to have male victims (10.3% | n = 348) compared to only 2.2% (n = 74) female victims (χ^2 [4, N = 3,378] = 34.479, p < .001). The ratio of male victims was 78.8% for male perpetrators and 78.6% for female perpetrators. Most violent acts committed by male characters were lethal (55.7%), whereas more violent acts committed by female characters (51.5%) were nonlethal (χ^2 [4, N = 3,378] = 29.589, p < .001). Further, male victims were more likely to be subjected to lethal violence (55.3%) when compared to female victims (43.8%) (χ^2 [4, N = 3,378] = 52.533, p < .001).

For both genders, firearms were the most described weapons for committing murder (see also Table 4), but for male characters, this weapon was more prevalent than for female characters. Out of all 2,704 male violent acts, about 40% were gun-related (n = 1,085), and a gun was involved in a third of all female violent acts (n = 145). Almost all violent acts with explosives were conducted by men (2.1% of all violent acts for men), while women conducted only three violent acts with explosives (0.7% of all violent acts for women). On the other hand, women more often use blades and knives than men do (14.4% compared to 7.7%); women more often use chemicals (poison) than men do (2.7% compared to 1.7%), and women more often use their bare hands than men do (32.7% compared to 24.5%).

Table 3. Aggressors' and Victims' Genders and Severity of Violence.

		Male victim	Fem. victim	Unknown	Total	
Aggressor						
	Male	2,132	334	238	2,704	(80.0%)
	Female	348	74	21	443	(13.1%)
	Unknown	196	35	0	231	(6.8%)
Total		2,676	443	259	3,378	
		(79.2%)	(13.1%)	(7.7%)	(100%)	
		Lethal	Nonlethal	Unknown	Total	
Aggressor						
	Male	1,506	1.079	110	2,704	(80.0%)
	Female	203	228	12	443	(13.1%)
	Unknown	146	80	5	136	(6.8%)
Victim						
	Male	1,481	1,086	109	2,676	(79.2%)
	Female	194	235	14	443	(13.1%)
	Unknown	180	14	13	259	(7.7%)
Total		1,855	1,387	136	3,378	
		(54.9%)	(41.1%)	(4.0%)	(100%)	

Table 4. Types of Violence for Both Aggressor Sexes.

	Male aggressor		Female aggressor		Unknown	Total	
Gun	1,085	(40.1%)	145	(32.7%)	105	1,335	(39.5%)
Physical	663	(24.5%)	145	(32.7%)	31	839	(24.8%)
Blade	207	(7.7%)	64	(14.4%)	12	283	(8.4%)
Environment	109	(4.0%)	11	(2.5%)	4	124	(3.7%)
Chemical	47	(1.7%)	12	(2.7%)	10	69	(2.0%)
Explosives	58	(2.1%)	3	(0.7%)	7	68	(2.0%)
Vehicular	46	(1.7%)	9	(2.0%)	4	59	(1.7%)
Projectile	32	(1.2%)	10	(2.3%)	10	52	(1.5%)
Sexual	46	(1.7%)	1	(0.2%)	2	49	(1.5%)
Rope	34	(1.3%)	4	(0.9%)	1	39	(1.2%)
Forced drugs	2	(0.1%)	2	(0.5%)	0	4	(0.1%)
Unknown	375	(13.9%) 37	(8.4%)		45	457	(13.5%)
Total	2,704	(100%)	443	(100%)	231	3,378	(100%)

Finally, the most prevalent type of described violence against women was physical assault (30.5% | *n* = 135), followed by gun assault (26.0% | *n* = 115), blade assault (9.0% | *n* = 40), and sexual molestation (8.6% | *n* = 38). All other types of violence were prevalent in less than 5% of the incidents. For male victims, these percentages differ as gun assaults were most prevalent (41.8% | *n* = 1,119), followed by physical assaults (24.8% | *n* = 664), and violent acts involving blades or knives (8.9% | *n* = 237). All other types involved low percentages (sexual assaults against men occurred only 11 times, reflecting 0.4% of the violent acts against men).

Trends Over Time: Severity of Violence and Gender

A longitudinal logistic regression analysis was performed to investigate the prevalence of the described severity of violence (lethal versus nonlethal) over the years (1973–2011), where a nonlethal act of violence was coded as one. We investigated whether the proportions varied across years. Furthermore, victims of acts of violence were most often male (80%), and we tested whether this proportion remained constant over time. By conditioning on gender of the victim, the proportions of a nonlethal act of violence for male and female victims over the years were estimated and compared.

The results of the regression analysis show that both explanatory variables (year and gender) explained a significant amount of variability in the outcome variable "severity of violence." Figure 3 gives the estimated logistic curve of the predicted probability of nonlethal act of violence over years for male (left subplot) and female victims (right subplot). The logistic regression curve for males shows that the probability of a nonlethal violent act increases slightly over years, but it is still below 50% in 2011 (Wald = 3.833, $p < .001$). Male victims were more likely to be involved in a lethal act of violence than in a nonlethal act, but this probability decreases significantly over the years (Wald = 4.838, $p < .001$). The estimated predicted probabilities show that after 1984, female victims were more and more likely to be involved in nonlethal acts of violence. The increase over the years in the probability of a nonlethal violent act was equal for male and female victims, since the interaction effect of time with victims' gender was not significant (Wald = 1.344, $p = .179$). It must be noted that around 80% of the victims were men, so much more data were used for estimating the predicted probabilities for males. This leads to a much tighter 95% confidence interval (in shaded gray) for males compared to females.

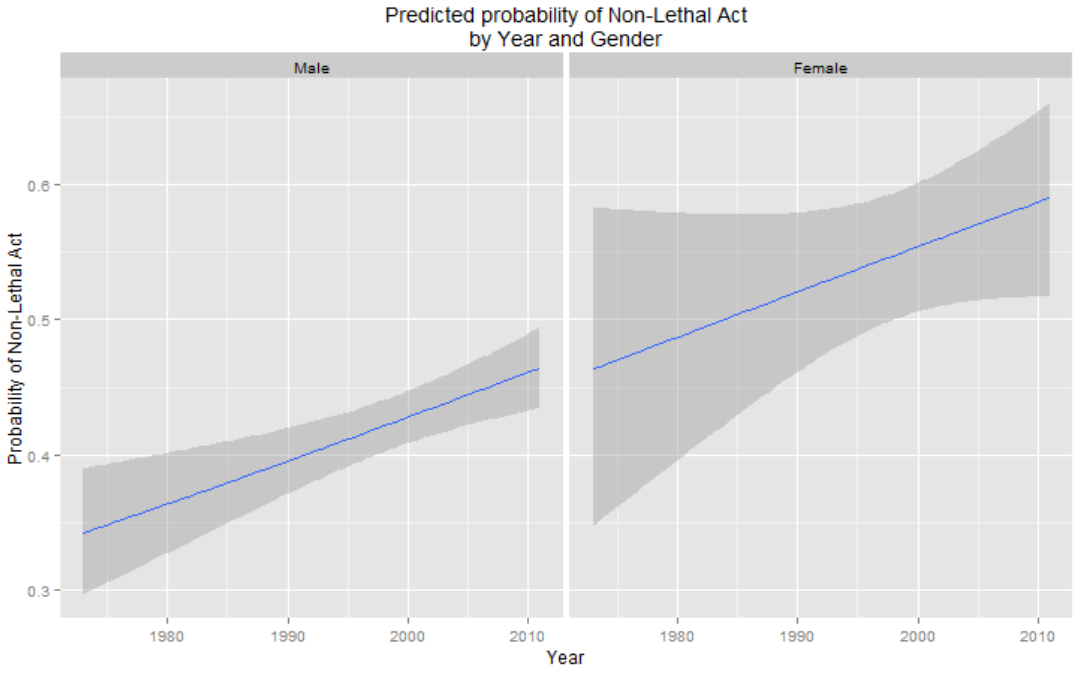

Figure 3. Probability of nonlethal act of violence by year and gender of victim.

Trends Over Time: Type of Violence and Gender

As was shown in Tables 3 and 4, over the years, lethal acts of violence were most often committed with a gun on male victims and by male perpetrators. We tested whether gun use varied over the years, and whether percentages of gun use differed between males and females from a victim's and perpetrator's perspective. Therefore, a longitudinal logistic regression was performed with "gun use" as an outcome variable, which was one for gun assault and zero otherwise. The explanatory variables were time in years, severity of act (lethal or nonlethal), perpetrator (male or female), and victim (male or female).

First, the logistic regression shows that the use of a gun in the movies from 1973 to 2011 does not vary over time. Second, significant relations were found between gun use and the other explanatory variables. Figure 4 shows the estimated probabilities of gun use: For lethal acts of violence, gun use is much more likely (Wald = -9.731, $p < .001$). For nonlethal acts, the odds of not using a gun versus using a gun changes significantly in favor of using a gun. In that case, it is more than twice as likely that a gun is used. The odds of not using a gun versus using a gun is also influenced by the victims' gender: Male victims are more likely to be involved in gun crime than female victims (Wald = -5.737, $p < .001$). Third, the odds of using a gun versus not using a gun for male victims are around 1:1.4; and for female victims,

the odds are 1:2.8 (about twice as low). So, for a randomly chosen violent movie (1973-2011), it is 1.4 times more likely for a male victim and 2.8 times more likely for a female victim that the crime described was committed without a gun. It is also apparent that male perpetrators are more likely to use a gun than female perpetrators (Wald = -2.420, p = .0155). However, differences between male and female perpetrators in the probability of using a gun remain constant over time.

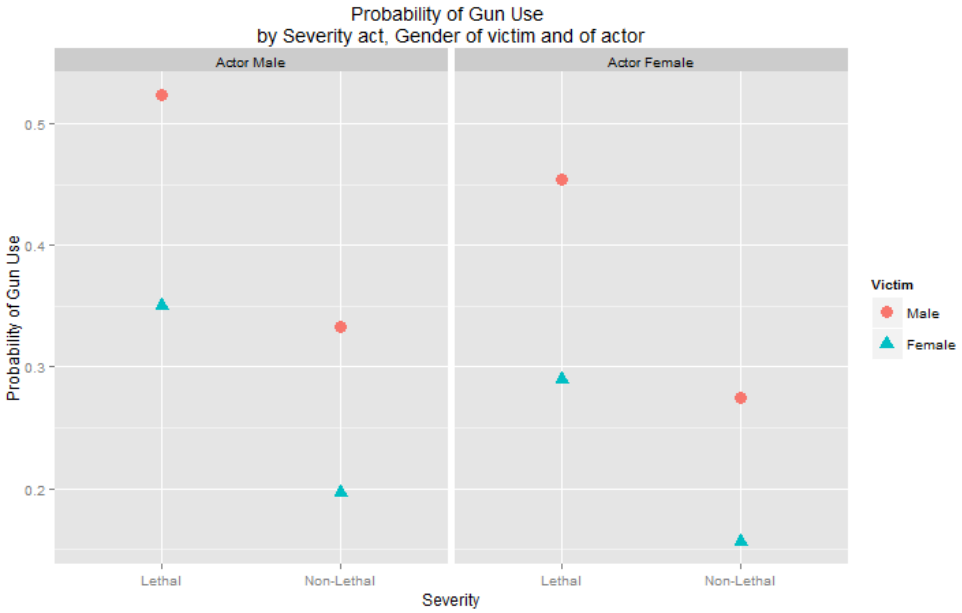

Figure 4. Probability of gun use by severity of act, and gender of victim and of actor.

A longitudinal multinomial logistic regression was performed to investigate whether the occurrences of types of violent acts vary over time, and whether they depend on gender of the victims. The outcome variable is the type of violence, which is a nominal variable consisting of five categories (see Table 5). The probability of each outcome was predicted by modeling the odds of the outcome to the use of a gun. Furthermore, we tested whether other factors had an influence on the odds. Specifically, we tested whether the odds changed over time and over gender (female coded as one). Therefore, the explanatory variable "year" (1973–2011) was mean-centered, so each intercept defined the preference of the corresponding type of violence over the use of a gun in 1998.

In Table 5, each intercept refers to the preference of the corresponding type of violence to the use of a gun in 1998. For a unit change in an explanatory variable, the odds ratio is multiplied with the exponentiated regression effect. We use this interpretation of the estimated effects, and the

exponentiated effects are also given in Table 5. The exponentiated effects are computed as the exponent of the estimated regression coefficients. The intercepts are the estimated odds of types of violence to using a gun concerning male victims in 1998. It shows that for various other types of violence and the class "Unknown" type of violence, a gun is around 3.5 (1/.29) times more likely to be used on male victims in 1998. These odds are quite different for female victims in 1998, since the probability of other type of violence and "Unknown" type of violence is three, and around 1.5 times higher than the probability of using a gun, respectively. In 1998, the probability of using a gun is 1.7 times more likely than using physical violence when it concerns a male victim. For a female victim in 1998, the odds changed in favor of physical violence and, multiplied by 1.97, the odds of physical violence over using a gun is 1:.86. The preference of physical violence to using a gun remained constant over time. The use of a gun becomes more prevalent over time. The standard deviations of the regression effects are given in brackets.

Table 5. Multinomial logistic regression of type of violence on gender of victim and year (Reference category: Gun assault).

Type of violence	Intercept	Female victim	Year
Various other types	.29(.06)	3.04(.15)	.98(.005)
Unknown assault	.29(.06)	1.48(.18)	.98(.005)
Physical assault	.59(.05)	1.97(.14)	1.00(.004)
Blade assault	.21(.07)	1.64(.19)	.99(.006)

Discussion

In the field of communication science, most research on framing focuses on the use of frames in news media. In this study, however, we further investigated the use of framing regarding fictional media. Unlike news media, which package information through their reporting on events, fictional media can convey relevant messages through character development, dialogue, and plot (Mulligan & Habel, 2011). We tried to uncover the most prominent fictional messages as interpreted by the audience and argue that these viewers' descriptions can be regarded as frames themselves. Because these descriptions are the result of collaborative editing activities, including peer reviewing and correcting, apparently the elements described are deemed most important to this crowd. It was explicitly not our aim to investigate whether these descriptions accurately represent the actual content of the movies described.

In this study we explored the combined frames of violence and gender differences concerning American film history, and we found that the frames described in the crowdsourced movie descriptions reflect mainly male violence. Also the types of violence seem in line with societal violence, which implies that the violent content in movies is rather in line with actual violence. An innovative approach was chosen to achieve this objective. Unlike most content analyses about film by means of a thorough analysis of the films themselves, we used the power of observation and documentation of viewers and investigated viewers' descriptions of the portrayal of violence in almost 40 years of movie history in the crowdsourced IMDb synopsis texts. We analyzed the types of violence depicted in action, thriller, crime, and adventure

movies over a 39-year period. Subsequently, we created an overview of the severity per type of violence, and we investigated the violent acts displayed by male and female movie characters. Furthermore, we investigated the trends of all three variables over the years (1973–2011).

Regarding the type of violence, the crowdsourced IMDb synopsis texts revealed that the most common type of violence, by far, and particularly in terms of lethal violence, involves the use of a firearm. The gun is the weapon of choice in movies (texts) over the entire period from 1973 to 2011. The second-most-popular weapon described (we omit the "physical" category, because this involves multiple small weapons and violence with bare hands) are blades and knives. In real American society, crime data on homicides from the U.S. Department of Justice (2011) shows that the firearm is the most-often-used weapon. However, the percentage of firearm-related homicides is far greater than the number of cases described by movie viewers. For example, the FBI Uniform Crime Reports from 2009 indicate that nearly 70% of all homicides involved a firearm, with similar percentages throughout time. In 2009, the FBI reported that 13% of all homicides involved such a sharp weapon. For the movie texts, this was 8.4%. In sum, the type of violence described by viewers seems to be rather similar to movie contents and actual crime data. We suggest future research aimed at thoroughly investigating the (causal) relation between societal violence and movie violence.

Our crowdsourced data further show that male characters are consistently described in more violence than female characters in both perpetrator and victim roles. The relative ratio of male versus female perpetrators and victims has remained notably constant throughout time, averaging an approximately 80% perpetrating/victimization rate for males compared to 20% for females. Earlier studies focusing on actual movie contents, such as the study of Smith et al. (2010), showed that most of the violent perpetrators (73%) on U.S. prime-time television are male. The relative percentages for each year are quite similar, with the perpetrator rates for males and females in movies spiking slightly between 2010 and 2011, but staying constant for victim rates.

The descriptions of viewers reflect U.S. Department of Justice statistics on violence crime related to gender, as female characters commit more nonlethal violence and males predominantly commit violence with lethal consequences. Also, regarding the type of violence, the descriptive texts are in line with sex stereotypes, as men mainly use guns and explosives, and women mainly use their bare hands, knives, and poison as a weapon. Further, women are far more often sexually molested than men. Out of all the cases of described violence, among female characters, one out of 11 incidents involves sexual violence. Amongst male characters, this is only one out of every 250 incidents. This sets the tone that women are the victims of sexual harassment, and it depicts women as sexual objects. The frames used by the viewers feed the thought that the viewers may have relied on stereotypes when constituting the frames.

Although this study demonstrates that some similarities may exist between the landscape of violence in real life, violence depicted in films, and violence described in movie synopses, each person will come into contact with only a minimal amount of this violence in their daily lives. However, many are exposed to violent media and, therefore, we are constantly confronted with the notion that violence is all around us and that males are much more frequently involved in violent crime. Many studies have found a

relationship between exposure to harmful media content and the development of undesirable attitudes and behaviors, violent behaviors in particular (Gosselt et al., 2012). For example, Scharrer (2004) found that exposure to hyper-masculine images (including hardened sexual attitudes toward romantic partners, a desire for action and danger, and the acceptance of physical violence as a part of male nature) increased young men's acceptance of beliefs, namely that violence is both thrilling and manly. This inevitably shapes our view of violence and gender roles.

Although films are generally more violent than society, as indicated by the average of two violent incidents described per movie, gender stereotypes appear to be fairly accurate for the time period examined in our study, reinforcing valid stereotypes for at least 35 years. This result suggests that the perceptions of violence and gender are unlikely to change soon, and they will most likely continue following the established trend. A lifetime of media stereotype reinforcement may be partially responsible for this effect (Eschholz et al., 2002). Media are considered one of the most powerful political, economic, social, and cultural influencers of our time, shaping public perceptions of reality and setting the norms. Therefore, a diversified, moderate, and realistic media representation is preferable. Factors such as social pressure, personality, upbringing, and education also apply, but media are so prevalent in our daily lives that this is likely an important factor, particularly because media are often our main source of morality for the justification and application of violence. A sudden drastic change to the status quo for violence in the movies, such as a shift to a 50% violence rate for women, could also have profound effects in the opposite direction.

The use of viewers' synopsis texts of movies proved to be an interesting and effective tool for content analysis of violence. Exploring the value of a crowdsourced corpus of analysis was another aim of this study. This study questioned if such information was of value for scientific research. Coding the texts has at least one advantage: Due to the nature of the corpus (texts), it is possible to code all available violent acts. Coding an actual movie is far more complex, since violent incidents might be diffuse and not properly demarcated. On the other hand, viewers' descriptions contain only the incidents that the crowd considers to be important enough to describe. Moreover, due to the peer review nature of crowdsourced text, the overall quality of writing, grammar, and spelling is an issue of concern, but in our study, the texts were surprisingly usable and high in quality.

The sample we have been studying can be referred to as a convenience sample (i.e., nonprobability-based sample). The data are sampled from the IMDb database, and we have no information about the characteristics of the survey population. Although it is reasonable to assume that our sample is representative of the population of IMDb reviewers, we have to acknowledge that this subpopulation is made up of people who particularly like movies and who like to share their thoughts and experiences with others. This makes it not possible to generalize our results beyond this subpopulation. At best, we can assume that the characteristics of this subpopulation do not differ much from a more general population. This might be a reasonable assumption when the crowdsource data is so large that it must be coming from a general population.

We believe that clear advantages follow from using crowdsourced texts. Although the level of results has a holistic nature, trends and comparisons are feasible and audience perceptions and interpretations can be studied. Furthermore, the use of automatic content analysis packages enables more detailed and efficient analysis. Additionally, because crowdsourced (movie) information is a relatively new phenomenon, both the quantity and quality of such information is expected to increase. As such, larger and higher quality samples will become available in the future, whereas traditional content analysis of all the relevant material within a certain time period will become increasingly difficult.

When characteristics of respondents are known, and we have knowledge about who is responding, it will be possible to generalizing results to a specific population. The respondent characteristics can be used to define survey weights, which are relevant for transforming the sample to population data. When the crowdsourced data is huge, it is to be expected that the population can be well represented using the survey weights.

Other caveats of the method used here are that not all information is available in text form. For example, due to the summarizing nature of a movie synopsis, the length of the texts varied significantly. Information that may have been of interest (e.g., appearance or estimated age or race of a character) is lacking in such texts. If highly detailed information were required, traditional content analysis would be a more suitable choice. For a similar study, examining the entire available synopsis library would be interesting. This study focused on those movie genres that were most likely to contain realistic violent content, but many usable texts were therefore excluded. A separate study could examine if violent media that are unlikely to occur to the viewer, such as violence involving animated figures, is perceived differently than human-on-human violence.

Analyzing media content from viewers' perspective for the first time, this study shows that crowdsourced descriptions of movies are useful and that these descriptions could be used to analyze movie violence. Future research should establish whether viewers' descriptions of what they have seen match the findings of traditional content analyses and actual crime figures. Content analysis using crowdsourced information may be a worthwhile area for future research. In addition to violence in movies, other contents could be studied from cultural, relational, ethical, or historical perspectives.

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