ORIGINAL ARTICLE

Injury prevention practices as depicted in G and PG rated movies: the sequel

L T Ramsey, M F Ballesteros, A R Pelletier, J Wolf

Injury Prevention 2005;11:353–356. doi: 10.1136/ip.2005.009035

See end of article for
authors' affiliations

Correspondence to:
Dr L T Ramsey, Centers for
Disease Control and
Prevention, Division of
Nutrition and Physical
Activity, 4770 Buford
Highway, MS K-26,
Atlanta, GA, USA;
lramsey@cdc.gov

Accepted
21 September 2005

Objective: To determine whether the depiction of injury prevention practices in children's movies released during 1998–2002 is different from an earlier study, which found that characters were infrequently depicted practicing recommended safety behaviors.

Methods: The top 25 G (general audience) and PG (parental guidance suggested) rated movies per year from 1998–2002 comprised the study sample. Movies or scenes not set in the present day, animated, documentary, or not in English were excluded; fantasy scenes were also excluded. Injury prevention practices of motor vehicle occupants, pedestrians, bicyclists, and boaters were recorded for characters with speaking roles.

Results: Compared with the first study, the proportion of scenes with characters wearing safety belts increased (27% v 35%, $p < 0.01$), the proportion of scenes with characters wearing personal flotation devices decreased (17% v 0%, $p < 0.05$), and no improvement was noted in pedestrian behavior or use of bicycle helmets.

Conclusions: Despite a modest increase in safety belt usage, appropriate injury prevention practices are still infrequently shown in top grossing G and PG rated movies. The authors recommend that the entertainment industry incorporate safe practices into children's movies. Parents should call attention to the depiction of unsafe behaviors in movies and educate children to follow recommended safety practices.

Unintentional injuries are the leading cause of death in the United States for people aged 1–34 years.¹ In 2001, unintentional injuries caused 4109 deaths and over 5.8 million injuries to children aged 1–13 years.² Unintentional injuries can be reduced by following safety recommendations, such as proper use of safety belts and child safety seats when in a motor vehicle, use of personal flotation devices (PFDs) when boating, crossing in a crosswalk and looking both ways before crossing a street, and use of helmets when involved in recreational activities such as bicycling and rollerblading.

The social cognitive theory suggests that children's behavior may be influenced by many factors, including parents, peers, and television/film characters—particularly if an attractive character consistently engages in a certain behavior.³ A study found that children aged 2–17 years who were seen in an emergency department reported frequently knowing someone who sustained injuries while imitating media behavior.⁴ Studies also suggest that children imitate behavior, such as violence and tobacco use, depicted in media.^{4–10} Moreover, increased access to movies at home with video, DVD, and cable television allows motion pictures to be viewed more frequently, playing a potentially greater role in shaping children's behaviors. A previous study examining G (general audience) and PG (parental guidance suggested) rated movies during 1995–97 found that movies infrequently depicted characters practicing nationally recommended safety behaviors.¹¹ We examined movies during 1998–2002 to determine whether the depiction of injury prevention practices in children's movies has improved.

METHODS

The study protocol remained unchanged from the 1995–97 study except for three minor variations.¹¹ First, in the current study, movies were viewed in VHS or DVD format, whereas in the original study all films were viewed in VHS format. Using DVD allowed greater clarity when viewing movies. Second, in

the current study, the same pair of reviewers viewed each movie together, whereas in the original study reviewers were not in the same pairs and movies were sometimes viewed separately. Third, in the current study, documentaries were excluded. The first study included one documentary. Documentaries were excluded because we expected these movies to present information as it occurred in real life.

Sample

For each year from 1998–2002, we selected the 25 G or PG rated movies with the highest annual domestic box office gross.^{12–16} Thus our study sample consisted of 125 movies. Movies were categorized as action/adventure films, children/family films, comedies, dramas, and other based on categories from a national video store chain. Movies not set in the present day, animated, documentary, or not in English were excluded. We excluded fantasy characters (for example, Santa Claus, angels). Scenes depicting events not set in the present day (1992–2002) were excluded from data collection because injury prevention recommendations have changed over time. Movie scenes that showed fantasy settings (for example, flying cars and brooms) or scenes in which certain safety practices are uncommon (for example, safety belt use on a bus) were also excluded.

Coding

The coding unit was a scene, defined as a portion of the movie in which the narrative and action formed a coherent whole. For example, a family in a motor vehicle going to a restaurant would be considered one scene. A person scene was defined as a scene in which one person was involved in an activity of interest. For example, a person riding in a motor vehicle would be counted as one person scene. Four people riding in a motor vehicle in one scene would be counted as four person scenes.

Abbreviation: PFD, personal flotation device.

Variables coded

Injury prevention practices were based on recommendations of national organizations (for example, the American Academy of Pediatrics and Centers for Disease Control and Prevention).^{17–22} For motor vehicle occupants, we examined safety belt use; for pedestrians crossing a street, we assessed if people used a crosswalk and if they looked both ways before entering the street; and for recreational boaters we assessed use of PFDs. For bicycling, rollerblading, riding a scooter or motorcycle, horseback riding, skateboarding, and snowmobiling, we recorded helmet use. For rollerblading and skateboarding, we also recorded the use of elbow pads, wrist guards, and knee pads.

Information was recorded only for characters with speaking roles, defined as having more than two lines of dialogue. We included only characters with speaking roles because (1) the behavior of characters with speaking roles may be more likely to have an effect on the viewing audience than those without speaking roles and (2) it would have been difficult to code the behavior of all characters in some scenes (for example, a scene with hundreds of pedestrians on a busy street). We collected data on age group and sex of characters. Characters were categorized as children or adults based on physical appearance, school attendance, job, and other distinguishing factors shown in the movie. To be consistent with the first study, characters in scenes where safety belt usage was not clearly shown were treated as unbelted. Scenes with characters already in a street were coded only for use of a crosswalk because we were unable to determine if the character looked both ways before entering a street. We did not code injury prevention practices during life threatening scenes. For example, if a character forced someone onto a boat at gunpoint, use of a PFD was not recorded.

Using a standardized data collection form, two coauthors viewed each movie together so that questions regarding coding of safety behaviors could be discussed and differences reconciled. Pilot testing was performed on five movies to verify consistency of coding and classifying scenes between coauthors. Comparisons between 1995–97 and 1998–2002 data were analyzed using χ^2 testing; if a cell size was <5 , Fisher's exact test was used instead. Significance testing was

restricted to activities with at least 20 person scenes in each study. Differences were considered significant if $p < 0.05$.

RESULTS

Of the 125 movies 61 (49%) met the inclusion criteria. Eleven (18%) movies were G rated and 50 (82%) were PG rated. Thirty one (51%) movies were comedies, 13 (21%) were children/family films, six (10%) were dramas, four (7%) were action/adventure films, and seven (11%) were other. The movies reviewed in this study accounted for \$3.6 billion in box office receipts. The median domestic box office gross was \$34.6 million (range \$2.6–\$317.6 million). Sixty four (51%) movies were excluded; 36 (29%) were animated, 24 (19%) were not set in the present day, three (2%) were not in English, and one (1%) was a documentary. Of the 61 movies meeting the inclusion criteria, there were 759 person scenes that involved characters with speaking roles participating in activities of interest. Thirty one (4%) person scenes involved a fall, crash, or near drowning, six person scenes (1%) resulted in an injury, and one person scene ($<1\%$) resulted in a death. One injury was in a boat, and the other injuries and death were in motor vehicle crashes.

Ninety three percent of movies depicted characters riding in motor vehicles, with a median of eight person scenes per movie (range 1–23) (table 1). Of 487 person scenes, 172 (35%) depicted characters wearing safety belts. No significant differences in safety belt usage by age, sex, or movie rating were noted.

Sixty four percent of movies depicted pedestrians crossing a street, with a median of two person scenes per movie (range 1–12). Of 119 pedestrian person scenes, 18 (15%) depicted pedestrians using a crosswalk. No significant differences in crosswalk use by age, sex, or movie rating were noted. Of 89 pedestrian person scenes, 19 (21%) depicted pedestrians looking both ways before entering a street. One (4%) of 26 children looked both ways before crossing the street compared to 18 (29%) of 63 adults ($p < 0.05$). No significant differences in looking both ways by sex or movie rating were noted.

Twenty percent of movies depicted characters bicycling, with a median of two person scenes per movie (range 1–14).

Table 1 Activities and safe practices in G and PG rated movies, 1995–2002

Activity	Safe practices	1998–2002 (n=61)		1995–97 (n=50)	
		Movies (%)	Safe practices/person scenes (%)	Movies (%)	Safe practices/person scenes (%)
Riding in a motor vehicle	Using safety belt or child safety seat	57 (93)	172/487 (35)*	45 (90)	119/447 (27)
Crossing street as a pedestrian	Using crosswalk	39 (64)	18/119 (15)	32 (64)	25/160 (16)
	Looking both ways		19/89 (21)		20/109 (18)
Riding a bicycle	Wearing helmet	12 (20)	6/40 (15)	15 (30)	4/64 (6)
Riding in a boat	Wearing PFD	9 (15)	0/23 (0)*	10 (20)	14/82 (17)
Riding a motorcycle	Wearing helmet	9 (15)	20/28 (71)	3 (6)	3/5 (60)
Horseback riding	Wearing helmet	5 (8)	0/19 (0)	3 (6)	2/7 (29)
Skateboarding		4 (7)		3 (6)	
	Wearing helmet		4/8 (50)		0/3 (0)
	Wearing elbow pads		2/8 (25)		0/3 (0)
	Wearing knee pads		2/8 (25)		0/3 (0)
	Wearing wrist guards		0/8 (0)		0/3 (0)
Riding a scooter	Wearing helmet	4 (7)	11/17 (65)	—	—
Rollerblading		3 (5)		8 (13)	
	Wearing helmet		1/3 (33)		28/42 (67)
	Wearing elbow pads		0/3 (0)		30/42 (71)
	Wearing knee pads		2/3 (67)		30/42 (71)
	Wearing wrist guards		2/3 (67)		31/42 (74)
Riding a snowmobile	Wearing helmet	2 (3)	6/13 (46)	1 (2)	1/7 (14)
Riding an ATV	Wearing helmet	1 (2)	1/2 (50)	—	—

*Significant change ($p < 0.05$) from first study. Significance testing was restricted to activities with at least 20 person scenes in each study. PFD, personal flotation device; ATV, all-terrain vehicle.

Of 40 person scenes, six (15%) bicyclists wore helmets. None of 13 adults wore helmets, compared with six (22%) of 27 children. None of the 13 females wore helmets, compared with six (22%) of 27 males. Differences in movie rating were not examined because of too few G rated movies with bicycling scenes.

Fifteen percent of movies depicted characters boating, with a median of two person scenes per movie (range 2–13). None of the 23 person scenes showed characters wearing a personal flotation device.

Ninety additional person scenes involved other popular recreational activities. These activities included riding scooters, motorcycles, snowmobiles, all-terrain vehicles, skateboards, rollerblades, and horses (table 1). Each of these activities occurred in no more than nine (15%) movies.

1995–97 study compared with 1998–2002 study

The proportion of movies excluded from review increased from the 1995–97 study to the 1998–2002 study (33% *v* 50%, $p < 0.05$), largely because of a greater number of animated movies in the second study (12% *v* 29%). The mean number of person scenes decreased from 16.3 per movie in the earlier study to 12.5 per movie in this study. Although the proportion of characters wearing safety belts increased significantly from the earlier study (27%) to this study (35%) ($p < 0.01$), no significant improvement occurred in the proportion of characters crossing in a crosswalk or looking both ways before crossing a street or using helmets when bicycling. There was a significant decrease in the proportion of characters wearing PFDs when boating, 17% in the earlier study compared to 0% in this study ($p < 0.05$).

DISCUSSION

Recommended injury prevention practices are infrequently depicted in top grossing G and PG rated movies. Since the 1995–97 study, the depiction of injury prevention has not improved, except for a modest increase in the proper use of safety belts use in motor vehicles. Despite this increase, the proportion of characters depicted in movies using a safety belt is still less than in actual life. During 1998–2002, safety belt use in G and PG rated movies averaged 35%; safety belt use by the US population during the same time period increased from 69% to 75%.²³ Our findings are consistent with other studies where safety belt use was found to be higher in actual life than portrayed in movies.^{24–25} Helmet use among bicyclists is also depicted less frequently in movies than in actual life. Helmet use among bicyclists is approximately 50%, while these G and PG rated movies only portrayed characters using bicycle helmets 15% of the time.²⁶ Viewing these unsafe injury prevention practices in movies might cause children to accept these behaviors as normative.

Movies represent one of the important media influences in the US. The movies reviewed were seen by millions of people in theaters and can be viewed multiple times on VHS, DVD, and television. Besides underrepresenting appropriate injury prevention practices, the consequences of risky behavior are often omitted from movies. The characters engaging in risky behavior in these movies were rarely injured even when involved in falls, crashes, or near drownings. Increased exposure to high risk behaviour with inappropriate safety protection and few consequences might cause children to minimize the potential dangers of such activity.

The findings in this report are subject to at least four limitations. First, we did not control for clustering of person scenes within movies in this study. Second, we limited our study to G and PG rated movies; PG 13 and R rated movies probably depict safe practices less frequently.²⁵ Third, only half of the top grossing movies from 1998–2002 met the inclusion criteria and were included in this study, limiting

Key points

- Appropriate injury prevention practices are infrequently depicted in children's movies.
- Except for a small improvement in safety belt use, there have been no positive changes in the depiction of injury prevention practices.
- The entertainment industry should incorporate safe practices into children's movies.
- Parents should point out the depiction of unsafe behaviors in movies to their children and educate their children on appropriate injury prevention practices.

the generalizability of our findings. Fourth, we collected data only for characters that had speaking roles. Many scenes had characters with non-speaking roles; therefore, the audience was potentially exposed to a greater number of person scenes than included in our study.

We recommend the movie industry present positive images in children's movies by following nationally recommended safety behaviors. We also recommend that consumer safety and other organizations work with the entertainment industry to incorporate safe practices into children's movies. Parents should point out the depiction of unsafe behaviors in movies to their children and educate their children on appropriate injury prevention practices.

ACKNOWLEDGEMENTS

We thank Julie Gilchrist, MD; Harshona Kaur, MD, MPH; Julie Magri, MD, MPH; Kyran Quinlan, MD, MPH; Jeff Sacks, MD, MPH; and Thomas Van Gilder, MD, MPH for their assistance.

Authors' affiliations

L T Ramsey, M F Ballesteros, Epidemic Intelligence Service, Division of Applied Public Health Training, Epidemiology Program Office, Centers for Disease Control and Prevention, Atlanta, GA, USA

L T Ramsey, State Branch, Division of Applied Public Health Training, Epidemiology Program Office, Centers for Disease Control and Prevention, Atlanta, GA, USA

L T Ramsey, A R Pelletier, New Hampshire Department of Health and Human Services, Concord, NH, USA

M F Ballesteros, Division of Unintentional Injury Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, Atlanta, GA, USA

A R Pelletier, Division of Adult and Community Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA, USA

J Wolf, National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, Georgia, USA

Funding: there was no external funding for this study. The work was conducted by federal employees with the Centers for Disease Control and Prevention. The Centers for Disease Control and Prevention reviewed and approved the manuscript.

Competing interests: none.

REFERENCES

- Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Office of Statistics and Programming, 10 Leading Causes of Death, United States, 2000. Available at <http://webapp.cdc.gov/sasweb/ncipc/leadcaus.html> (accessed October 2005).
- Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Office of Statistics and Programming, 10 Leading Causes of Nonfatal Injury Reports, United States, 2001. Available at <http://webapp.cdc.gov/sasweb/ncipc/nfilead.html> (accessed October 2005).
- Bandura A**. Social cognitive theory of mass communications. In: Bryant J, Zillman D, eds. *Media effects: Advances in theory and research*, 2nd ed. Hillsdale (NJ): Lawrence Erlbaum, 2001:121–53.

- 4 Bui TT, Simon HK. Wrestling with reality: are pediatric injuries related to media violence? *Society for Academic Emergency Medicine Annual Meeting* 2003;442 [abstract].
- 5 Schooler C, Flora JA. Pervasive media violence. *Annu Rev Public Health* 1996;17:275-98.
- 6 American Academy of Pediatrics, Committee on Public Health. Media violence. *Pediatrics* 2001;108:1222-6.
- 7 Wood W, Wong FY, Chachere JG. Effects of media violence on viewers' aggression in unconstrained social interaction. *Psychol Bull* 1991;109:317-83.
- 8 Distefan JM, Gilpin EA, Sargent JD, et al. Do movie stars encourage adolescents to start smoking? Evidence from California. *Prev Med* 1999;28:1-11.
- 9 Sargent JD, Dalton MA, Beach ML, et al. Viewing tobacco use in movies: does it shape attitudes that mediate adolescent smoking? *Am J Prev Med* 2002;22:137-45.
- 10 Dalton MA, Sargent JD, Beach ML, et al. Effect of viewing smoking in movies on adolescent smoking initiation: a cohort study. *Lancet* 2003;362:281-5.
- 11 Pelletier AR, Quinlan KP, Sacks JJ, et al. Injury prevention practices as depicted in G-rated and PG-rated movies. *Arch Pediatr Adolesc Med* 2000;154:283-6.
- 12 Variety. Top 250 films of 2002. Available at http://www.variety.com/index.asp?layout=chart_top_250&year=2001&dept=Film (accessed October 2005).
- 13 Variety. Top 250 films of 2001. Available at http://www.variety.com/index.asp?layout=chart_top_250&year=2001&dept=Film (accessed October 2005).
- 14 Variety. Top 250 films of 2000. Available at http://www.variety.com/index.asp?layout=chart_top_250&year=2000&dept=Film (accessed October 2005).
- 15 Variety. Top 250 films of 1999. Available at http://www.variety.com/index.asp?layout=chart_top_250&year=1999&dept=Film (accessed October 2005).
- 16 Variety. Top 250 films of 1998. Available at http://www.variety.com/index.asp?layout=chart_top_250&year=1998&dept=Film (accessed October 2005).
- 17 Centers for Disease Control and Prevention. Injury-control recommendations: bicycle helmets. *MMWR Morb Mortal Wkly Rep* 1995;44:1-18.
- 18 American Academy of Pediatrics Committee on Injury and Poison Prevention. Bicycle helmets. *Pediatrics* 2001;108:1030-2.
- 19 American Academy of Pediatrics Committee on Injury and Poison Prevention. Skateboard and scooter injuries. *Pediatrics* 2002;109:542-53.
- 20 American Academy of Pediatrics Committee on Injury and Poison Prevention and Committee on Sports Medicine and Fitness. In-line skating injuries in children and adolescents. *Pediatrics* 1998;101:720-2.
- 21 United States Coast Guard, Office of Boating Safety. Federal requirements and safety tips for recreational boats. Available at http://www.uscgboating.org/safety/fedreqs/eqa_pdf.htm.
- 22 Centers for Disease Control and Prevention. Motor-vehicle occupant injury: strategies for increasing use of child safety seats, increasing use of safety belts, and reducing alcohol impaired driving: a report on recommendations of the Task Force on Community Preventive Services. *MMWR Morb Mortal Wkly Rep* 2001;50(RR7).
- 23 National Centre for Statistical and Analysis National Highway Traffic Safety Administration, US Department of Transportation. Safety belt and helmet use in 2002- overall results. Washington: NHTSA, 2002. Publication DOT HS 809 550.
- 24 Jacobsen HA, Kruttre MW, Luke D, et al. Seat belt use in top-grossing movies vs actual US rates, 1978-1998. *Am J Pub Health* 2001;91:1395-6.
- 25 Greenberg BS, Thanki D. *The portrayal of safety belts in Hollywood motion pictures*. East Lansing: Michigan State University, 1997.
- 26 U. S. Consumer Product Safety Commission. National Bike Helmet Use Survey 1999. Available at <http://www.cpsc.gov/library/helmet.html> (accessed October 2005).

BOARD MEMBER BIOGRAPHY

Mark Stevenson

Professor Stevenson is the Director of the Injury Prevention and Trauma Care Division at The George Institute for International Health and a Professor in the School of Public Health at The University of Sydney. Before these appointments, Mark was an Associate Professor in the School of Population Health and founding Director of the Injury Research Centre in the Faculty of Medicine and Dentistry at The University of Western Australia. Mark has also worked as an Associate Professor in the Department of Epidemiology & Biostatistics at Curtin University, Perth, Australia as an epidemiologist at the Centers for Disease Control and Prevention in Atlanta, USA, as well as spending time at the Harvard University School of Public Health.

Professor Stevenson is a strong advocate for road and child injury prevention and has worked on numerous national and international projects related to these areas. He has extensive research experience including investigations of mobile phone use and motor vehicle crash, childhood pedestrian injuries, alcohol related road traffic injury, as well as studies involving pediatric fire and burn related injuries. He is a member of the Australasian Trauma Society, on the editorial boards for a number of international journals, is Chair of the New South Wales (Sydney) Chapter of the Australasian College of Road Safety and is a member of the Technical Advisory Group for the international not-for-profit Alliance for Safe Children.