

News, music videos and action movie exposure and adolescents' intentions to take risks in traffic

Kathleen Beullens*, Jan Van den Bulck

Leuven School for Mass Communication Research, Katholieke Universiteit Leuven Parkstraat 45 (Box 3603), 3000 Leuven, Belgium

Received 7 November 2006; received in revised form 25 June 2007; accepted 2 July 2007

Abstract

This study explored the relationship between adolescents' viewing of specific television genres (action movies, news and music videos) and the intention to take risks in traffic. Participants were 2194 adolescent boys and girls who completed a questionnaire on television viewing, risk perception and the intention to speed and drive after consuming alcohol. As hypothesized, more news viewing was associated with a higher perceived risk of drunk driving and speeding. More music video viewing, on the other hand, was negatively associated with the assessment of the dangers of speeding and driving under the influence of alcohol. Girls regarded speeding and drunk driving as more dangerous than boys did. Contrary to our hypotheses, action movie viewing did not make a significant contribution to our models. Both news and music video viewing were indirectly, via risk perception, related to the intention to drive risky. The more dangerous a particular behavior was perceived to be, the less likely respondents intended to exhibit this behavior in the future.

© 2007 Elsevier Ltd. All rights reserved.

Keywords: Traffic; Risk taking; Television; Adolescents; Alcohol; Speeding

1. Introduction

Traffic accidents are a major public health concern in industrialized countries. Young men appear to be at greater risk of being involved in motor vehicle accidents than most other groups in society (Belgisch Instituut voor Verkeersveiligheid (BIVV), n.d., p. 16; Harré, 2000, p. 206). Research has shown the high injury rate is only partly explained by inexperience as this group appears to be more inclined to take risks (Arnett et al., 2002; Ulleberg and Rundmo, 2002).

From a *developmental perspective* risk taking typically occurs in adolescence (Arnett, 1992a; Donovan and Jessor, 1985; Dworkin, 2005; Rai et al., 2003). It has been described as an inevitable part of that developmental stage. Young men take more risks because of their 'risk-taking propensity' and because they misperceive their personal crash-risk (Greene et al., 2000; Harré, 2000). Risk behavior has also been seen as a "negative by-product of cognitive development" (Greene et al., 2000, p. 441). Adolescents take non-deliberative risks; their focus is on

their own thoughts as a result of which they fail to see risks obvious to others (Greene et al., 2000, p. 441).

Risk taking has also been described as a *personality characteristic*. From this perspective a lot of attention has been paid to the concept of sensation seeking, defined by Zuckermann (1994, p. 27) as "the seeking of varied, novel, complex and intense sensations and experiences and the willingness to take physical, social, legal and financial risks for the sake of such experiences". Several researchers have investigated the relationship between sensation seeking and risk behavior (Arnett, 1996; Arnett et al., 1997; Jonah, 1997). In his literature review, Jonah (1997) concluded that the vast majority of studies show a positive relationship between sensation seeking and risky driving.

Finally, risk-taking has also been studied as a *learned phenomenon* (Greene et al., 2000). Individuals learn how to behave from their relatives and peers, but can also learn from the mass media acting as a referent of social norms (Arnett, 1995). Studies have found associations between television viewing and smoking (Gidwani et al., 2002; Pechmann and Shih, 1999; Sargent et al., 2001), alcohol use (Atkin, 1990; Robinson et al., 1998) and risky sexual behavior (Brown et al., 2006; L'Engle et al., 2006). The association between media use and risk taking in traffic has received much less attention, even though content analyses indicate that there may be a cause for concern. Connor and

* Corresponding author. Tel.: +32 16 32 32 19/20; fax: +32 16 32 33 12.

E-mail addresses: Kathleen.Beullens@soc.kuleuven.be (K. Beullens), Jan.VandenBulck@soc.kuleuven.be (J. Van den Bulck).

Wesolowski (2004) analyzed the newspaper framing of traffic accidents and reported a significant difference between media content and reality. Newspapers were found to over-represent accidents with teenage drivers or where the driver survived. Frost et al. (1997) analyzed mortality rates in print media by comparing the amount of text devoted to certain causes of death and actual mortality rates. While some causes of death were found to be underreported, this was not the case for motor vehicle accidents. Motor vehicle accidents were 12.8 times more likely to be reported, compared to what could be expected based on the actual incidence rates for this cause of death. Similarly, Combs and Slovic (1979) found spectacular causes of death such as traffic accidents to be over-reported in newspapers, while all forms of disease (a much more prevalent cause of death) received much less attention. McArthur et al. (2001) made similar observations about television news. Visually compelling news events, such as traffic accidents, received more coverage than other events.

The picture becomes more complex when fictional representations of driving and of accidents are taken into account. The way in which driving behavior is portrayed in popular culture has been described as a problem (Arnett et al., 2002). Since the 1950s car chase scenes have been an important part of television and movie content (Arnett et al., 2002; Greenberg and Atkin, 1983). Risky driving is often associated with masculinity, adulthood and approval by peers (Arnett et al., 2002; Harré, 2000) and often no safety precautions are made (Pelletier et al., 2000). Although television and movie characters frequently display very risky driving (Greenberg and Atkin, 1983; Will et al., 2005), safety-belts are hardly ever used (Greenberg and Gregg, 1998; Greenberg and Thanki, 1997; Pelletier et al., 2000). In addition to this, characters are rarely confronted with the adverse outcomes of their actions (Klein et al., 1993; Pelletier et al., 2000; Will et al., 2005; Winston et al., 2000). Winston et al. (2000) and Glik et al. (2005) claimed that even children's programs show similar images.

While news and fiction programs are obvious objects of study, music videos' content may be a cause for concern as well. There is a growing body of research about the portrayal of risk behavior in music videos (e.g. Diamond et al., 2006; DuRant et al., 1997a; Tapper and Thorson, 1994). Most studies looked at the representation of alcohol, tobacco, illicit substances (Diamond et al., 2006; DuRant et al., 1995, 1997a; Gruber et al., 2005) and aggression (DuRant et al., 1997b; Rich et al., 1998). These content analyses have shown that music videos portray a lot of risk behavior and that the consequences associated with this behavior are hardly ever shown (DuRant et al., 1997a). The presence of *traffic-related* risk behavior in music videos remains largely unexamined. To our knowledge only Baxter et al. (1985) have reported the frequency with which motor vehicles occur in music videos. Their results indicated that 'transportation' (defined as the use of various types of vehicles or modes of conveyance) occurred in 35.5% of the videos in their sample. The way in which these vehicles were depicted was not discussed.

Several researchers have reported an association between music video viewing and the engagement in risky behaviors (Atkin, 1990; Robinson et al., 1998; Van den Bulck et al., 2006). Wingood et al. (2003), for instance, found exposure to rap music

videos in particular to be positively related to a broad spectrum of risk behaviors. Viewers of this genre were more likely to have hit a teacher, have been arrested, and were more likely to use alcohol and drugs.

Several authors have argued that media images may distort viewers' perceptions of risk (Frost et al., 1997; McArthur et al., 2001). Kone and Mullet (1994) for instance compared risk ratings made by inhabitants from countries that differed in terms of geography, economics, politics and ethnic background. By looking at those who had similar viewing experiences they came to the conclusion that the mass media are a crucial factor in risk perception. Engelberg and Sjoberg (2005) also found a relationship between media use and risk perception. Various media-effects theories, such as Cultivation Theory, have stated that media content may influence viewers' perceptions of social reality (Yanovitzky and Stryker, 2001). Cultivation Theory argues that television is an important source of information and socialization. Because television fiction tends to be repetitive (similar scenes can be found in similar types of programs) the cultivation theorists believe that heavy viewers are more likely than light viewers to start perceiving the world as it is depicted on television (Escobar-Chaves et al., 2005; Nabi and Sullivan, 2001). Effects of television on perceptions of the frequency with which certain events occur or certain characteristics are distributed in a population have been coined "first order cultivation effects". Second order effects focus on television effects on value judgments or attitudes (Nabi and Sullivan, 2001).

Cultivation Theory only deals with changes in perceptions or attitudes as a result of exposure to media messages and therefore does not in itself explain changes in behavior (Escobar-Chaves et al., 2005; Nabi and Sullivan, 2001). Social psychological theories such as the Theory of Planned Behavior (TpB), however, have looked at the relationship between attitudes and behavior extensively (Ajzen, 1991; Perloff, 2003, p. 90). According to TpB, the most important predictor of behavior is the intention to perform the behavior. Behavioral intentions are assumed to "... capture the motivational factors that influence a behavior, they are indicators of how hard people are willing to try, of how much effort they are planning to exert, in order to perform the behavior." (Ajzen, 1991, p. 181). Within this framework, intention is held to be partly determined by attitude, that is, a general positive or negative evaluation of the behavior. A meta-analysis of 185 TpB studies addressing health- and risk related behaviors showed that intention was in fact the strongest predictor of subsequent behavior, and that attitudes appeared as the strongest predictor of behavioral intentions (Armitage and Conner, 2001).

In the current study the focus is on the relationship between television viewing and intention to drive risky. It is expected that specific media genres are related with the intentions to take risks in traffic and that this relationship is mediated via the perception of the dangers of a particular driving behavior.

1.1. Aim of the study

In this article, the relationship between self-reported exposure to specific media genres and traffic related risk taking will be

examined. More specifically the association between the viewing of several television genres (news, action programming and music videos), risk perception and the intention to speed and drive under the influence of alcohol among adolescents will be examined. This is relevant for two reasons:

First, most researchers have investigated risky driving among young drivers (e.g. Arnett et al., 1997; Greening and Stoppelbein, 2000; Moller, 2004). However, following the developmental perspective on risk taking, most authors have claimed that risk behavior typically occurs during adolescence (Arnett, 1992a; Donovan and Jessor, 1985; Dworkin, 2005; Greene et al., 2000; Harré, 2000; Rai et al., 2003). Therefore, we argue that a risk-taking propensity may be present before a person starts driving (in Belgium a driver's license can only be obtained at the age of 18). This study looks at adolescents' *intentions* for risky driving to examine the extent to which perceptions and beliefs predict behavioral intentions.

Second, this study looked at the impact of specific television genres such as news, action movies, and music videos. Other researchers have focused mainly on the relationship between *news watching* and risk perception (Engelberg and Sjoberg, 2005; Kone and Mullet, 1994). Despite the fact that content analyses indicate that risky behavior is also shown in action programming (Arnett et al., 2002) and music videos (DuRant et al., 1997a) the relationship between those genres and traffic-related risk perception and the integration of different genres into one model remain largely unexamined.

1.2. Hypotheses

Following Cultivation Theory, frequent exposure to similar news messages (i.e. spectacular traffic accidents) should lead to an overestimation of traffic accidents. Therefore, we expect television news watching to be positively related to the assessment of the dangers of speeding in the first model and the dangers of drinking and driving in the second model.

H1. Television news watching is positively related to the assessment of the dangers of speeding and drunk driving.

Donovan and Jessor (1985) have found that different problem behaviors co-occur and may comprise a problem behavior pattern. This is consistent with the finding (Van Beurden et al., 2005) that strong relationships exist between heavy episodic drinking, celebrating behaviors and riding with an alcohol impaired driver after controlling for several covariates. We therefore expect music video viewing to be negatively related with traffic-related risk perception.

H2. Music television viewing correlates negatively with the assessment of the dangers of speeding and drunk driving.

Car chase scenes are an important part of action programming (Arnett et al., 2002). This genre is expected to be related to the two measures of risk perception in the same direction as music television viewing.

H3. Watching action movies is negatively related to the assessment of the dangers of speeding and drunk driving.

Second, following the TpB, the assessment of risk is associated with the intention to perform a particular behavior. This assumption results in three hypotheses.

H4. The assessment of the dangers of speeding is negatively correlated with the intention to perform the corresponding behavior.

H5. The assessment of the dangers of drunk driving is negatively correlated with the intention to exhibit that particular behavior.

Third, Ajzen (1991, p. 188) suggested that the relative importance of the different concepts included in the TpB may vary across different populations (e.g. boys and girls). Research has also shown that although all risk groups underestimate their actual crash risks, high risk groups such as young men under assess their personal road-traffic risk even more than other risk groups do (e.g. young women) (Andersson and Lundborg, 2007). Therefore, we expect gender to be a significant predictor of the assessment of the dangers of speeding and drunk driving.

H6. Women assess speeding and drunk driving as more dangerous than men do.

2. Method

2.1. Sample

Questionnaires were administered to a stratified random sample of secondary school students in Flanders, Belgium. From the official list of secondary schools in Flanders 20 schools were randomly selected. These schools were contacted with the request to cooperate in a large-scale study on the relationship between media use and risk behavior among adolescents. When a school agreed to cooperate, all students from the fifth and sixth year were included in the sample. This selection procedure was repeated until 15 schools agreed to cooperate in the study. The study and sampling method were approved by the Institutional Ethics Committee of the Katholieke Universiteit Leuven and permission to interview the children was obtained from the legal guardians of the children.

In the weeks following sample selection research assistants visited the selected schools to administer the questionnaires. The study was presented to the pupils as a study on leisure activities (part 1) and traffic (part 2). In total 2194 pupils filled out a standardized, self-administered questionnaire including measures of television viewing and risky driving. 65.2% of the students were boys, 34.8% were girls. 41.7% of the respondents were born in 1988, 36.5% in 1989 ($M = 1988$, $S.D. = .93$), thus the large majority of our respondents were 16 or 17 years old. In Flanders a distinction is made between general education (ASO), technical education (TSO) and vocational training (BSO). A particular schooling level is one of the determinants for job prospects and access to further education. General education (ASO) is therefore often regarded as the highest form of education and vocational training as the lowest (BSO) (Gutschoven, 2004). 39.4% of respondents were in general education, 39.3% technical education and 21.3% vocational training.

2.2. Measures

Music video exposure, news and action movie viewing were measured as part of a long list of television content types. Respondents had to answer ‘how often do you watch (music videos, television news or action movies) such as (list of programs aired at the time)’ on a scale (1) once a month or less, (2) once a week or less, but more than once a month, (3) more than once a week.

Risk perception was measured by several questions. Respondents were asked to indicate how dangerous they perceived a number of behaviors to be. Response categories ranged from 1 (not at all dangerous) to 7 (very dangerous). The risk perception of speeding was measured using 4 items: (1) speeding in a built-up area during daytime, (2) speeding in a built-up area at night, (3) speeding on the highway during daytime, (4) speeding on the highway at night. After calculating the internal consistency of these four items (Cronbachs Alpha = .69) they were summed to one variable. Risk perception of drunk driving was measured using a 4-item scale: (1) driving a car when you may have had too much alcohol to drive, (2) driving a car when you definitively had too much alcohol, (3) driving a moped when you may have had too much alcohol to drive and (4) driving a moped when you definitively had too much alcohol. These items were summed into one variable (Cronbachs Alpha = .88).

In order to measure the intention to engage in risky driving, respondents had to answer whether they thought they would (1) drive faster than allowed and (2) drive while they may have had too much alcohol in the future. Response categories were (0) never, (1) seldom, (2) sometimes, (3) often, (4) very often and (5) always.

Respondents were also asked their gender and school level.

2.3. Analyses

To assess the relationships between viewing news, music videos and action movies and risk perception on the intention to speed (model 1) and drunk driving in the future (model 2), a structural equation model was estimated using Amos 6™. The hypothetical models are shown in Figs. 1 and 2. Respondents’ schooling level and gender were included in the models since both variables have been shown to be related to risk taking in traffic (Begg et al., 1999, p.1; Borrell et al., 2005; Palamara

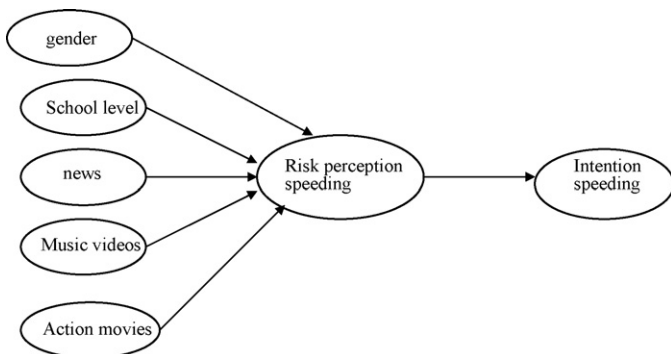


Fig. 1. Proposed model 1: intention to speed.

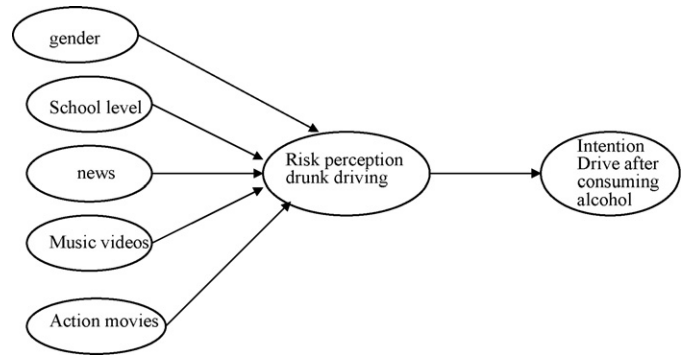


Fig. 2. Proposed model 2: intention to drive while you may have had too much alcohol.

and Stevenson, 2003, p.7). In the current study, we are mainly interested in the relationship between these variables. However, several other variables have been shown to be related to the intention to perform a specific behavior (cfr. TpB, Ajzen, 1991). These constructs have not been added to our models since the inclusion of constructs that have been shown to correlate with our dependent variable would have increased the fit of our models artificially.

3. Results

Independent samples *t*-tests (see Table 1) showed that boys watched significantly more news and action movies than girls did. No gender differences occurred for music video viewing. Girls perceived speeding and drinking and driving as more dangerous than boys did and had a lower intention to perform these risky behaviors.

Table 2 gives an overview of the correlations between the constructs in our models in the total sample, Table 3 shows Pearson correlation coefficients for boys (above the diagonal) and girls (below the diagonal) separately. Boys’ schooling level correlated significantly with the viewing of all television genres, both risk perception measures and the intention to drink and drive. For girls, on the other hand, school level is only significantly related with music video and action movie viewing, and with the intention to engage in both risk behaviors. The perceived risk of speeding is associated with viewing all television genres for boys, but not for girls. Among girls only music video viewing is significantly related to the assessment of the dangers of speeding. The risk perception of drinking and driving is also related to television genres for boys but less so for girls. Among girls only a relationship with news viewing was found while the association with music video watching was also significant for boys.

3.1. Model 1: intention to speed

It was hypothesized that gender, school level, news, music videos and action movies would predict respondents’ risk perception of speeding, and that the assessment of the dangers of speeding is a good predictor of the intention to engage in speeding. Maximum likelihood estimates provided no sup-

Table 1
Mean values and independent samples *t*-tests for boys and girls, and mean values for the total sample

Gender	Mean	S.D.	t	df	Sig.
News viewing					
Boy	2.40	.79	3.7	2134	.000
Girl	2.27	.77			
Total sample	2.35	.78			
Music video viewing					
Boy	2.46	.77	-.82	2121	.413
Girl	2.49	.75			
Total sample	2.47	.76			
Action movie viewing					
Boy	1.91	.70	21.39	1882.21	.000
Girl	1.33	.54			
Total sample	1.71	.70			
Risk perception speeding					
Boy	14.04	5.16	-9.95	1620.70	.000
Girl	16.27	4.79			
Total sample	14.84	5.15			
Risk perception drinking and driving					
Boy	20.72	5.23	-7.06	1795.92	.000
Girl	22.21	4.30			
Total sample	21.24	4.97			
Intention to speed					
Boy	2.63	1.02	10.99	1768.55	.000
Girl	2.17	.87			
Total sample	2.47	.99			
Intention to drink and drive					
Boy	1.15	1.03	4.10	1810.29	.000
Girl	.98	.85			
Total sample	1.10	.97			

Table 2
Correlations matrix for the total sample

Construct	1	2	3	4	5	6	7	8
(1) School level								
(2) News viewing	.088(**)							
(3) Music video viewing	-.105(**)	.072(**)						
(4) Action movie viewing	-.347(**)	.058(**)	.180(**)					
(5) Risk perception speeding	.128(**)	.053(*)	-.082(**)	-.135(**)				
(6) Risk perception drinking and driving	.086(**)	.102(**)	-.058(**)	-.046(*)	.451(**)			
(7) Intention to speed	-.115(**)	.010	.112(**)	.178(**)	-.419(**)	-.276(**)		
(8) Intention to drink and drive	.074(**)	-.031	.046(*)	.019	-.199(**)	-.438(**)	.304(**)	

**Pearson correlation is significant at the 0.01 level (2-tailed). *Pearson Correlation is significant at the 0.05 level (2-tailed).

Table 3
Correlations matrix for boys (above the diagonal) girls (below the diagonal)

Construct	1	2	3	4	5	6	7	8
(1) School level	1	.157(***)	-.107(***)	-.245(***)	.113(***)	.060(*)	-.036	.109(***)
(2) News viewing	.037	1	.059(*)	.044	.073(**)	.116(***)	-.007	-.025
(3) Music video viewing	-.133(***)	.100(**)	1	.226(***)	-.084(**)	-.075(**)	.128(***)	.051
(4) Action movie viewing	-.299(***)	.003	.151(***)	1	-.090(***)	-.006	.144(***)	.017
(5) Risk perception speeding	-.009	.067	-.096(**)	.006	1	.428(***)	-.399(***)	-.170(***)
(6) Risk perception drinking and driving	.018	.117(**)	-.032	.069	.453(***)	1	-.257(***)	-.436(***)
(7) Intention to speed	-.093(*)	-.008	.099(**)	-.008	-.377(***)	-.238(***)	1	.272(***)
(8) Intention to drink and drive	.090(*)	-.060	.043	-.101(**)	-.225(***)	-.416(***)	.352(***)	1

***Pearson correlation is significant at the 0.001 level (2-tailed). **Pearson correlation is significant at the 0.01 level (2-tailed). *Pearson correlation is significant at the 0.05 level (2-tailed).

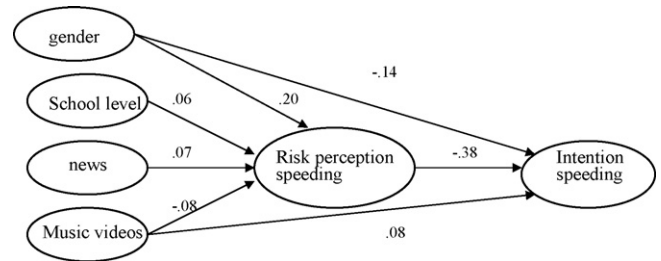


Fig. 3. Respecified model 1 correlations: school level × gender: $r = .30$; gender × news: $r = -.08$; school level × news: $r = .09$; school level × music videos: $r = -.11$; news × music videos: $r = .07$. RMSEA = .000; $p = .637$; $\chi^2 = 1.701$; CFI = 1.000.

port for the proposed model ($\chi^2 = 445.802$; $p = .000$; CFI = .723; RMSEA = .149). Following Aish and Jöreskog (1990, p. 441) a new model was tested without action movie viewing since the relationship between this variable and risk perception for speeding was not significant. The respecified model (Fig. 3) fitted the data very well ($\chi^2 = 1.701$; $p = .637$; CFI = 1.000; RMSEA = .000). When this model was tested for boys and girls separately, both models fitted the data (for boys: $\chi^2 = 3.029$; $p = .220$; CFI = .996; RMSEA = .019; for girls: $\chi^2 = 5.791$; $p = .055$; CFI = .973; RMSEA = .050).

Gender ($\gamma = .20$) and educational level ($\gamma = .06$) were found to be directly related to the assessment of the dangers of speeding. Gender was also related directly to the intention to speed ($\gamma = -.14$) which meant that girls were less likely to have the intention to speed. As hypothesized, television news was positively associated with the assessment of speeding ($\gamma = .07$); the more adolescents watched television news, the more risky they perceived driving faster than legally allowed to be. The oppo-

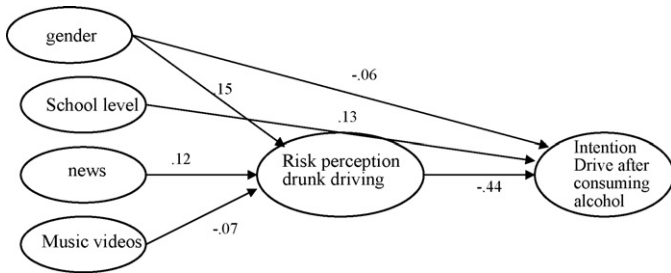


Fig. 4. Respecified model 2 correlations: school level \times gender: $r = .30$; gender \times news: $r = -.08$; school level \times news: $r = .09$; school level \times music videos: $r = -.11$; news \times music videos: $r = .07$. RMSEA = .013; $p = .240$; $\chi^2 = 5.494$; CFI = .998.

site was true for music video viewing. As hypothesized, music television viewing was negatively associated with the perceived risk of speeding ($\gamma = -.08$). Respondents who perceived speeding to be very dangerous were less likely to have the intention to drive faster than allowed in the future ($\gamma = -.38$). Music television viewing was also directly related to the intention to speed ($\gamma = .08$).

3.2. Model 2: intention to drink and drive

For our second model it was hypothesized that gender, school level, news, music videos and action movies would predict respondents' risk perception of drunk driving, and that the assessment of the dangers of drunk driving would be a good predictor of the intention to engage in driving after the consumption of alcohol. This theoretical model did not fit ($\chi^2 = 409.141$; $p = .000$; CFI = .739; RMSEA = .142). As in the previous model action movie viewing was removed. The new model (Fig. 4) was proved to have a good fit ($\chi^2 = 5.494$; $p = .240$; CFI = .998; RMSEA = .013). The model was also tested separately for boys and girls and yielded two models with a good fit (for boys: $\chi^2 = 3.887$; $p = .274$; CFI = .998; RMSEA = .014; for girls: $\chi^2 = 2.016$; $p = .569$; CFI = 1.000; RMSEA = .000).

Girls ($\gamma = -.06$) were less likely than boys to have the intention to drink and drive. Boys also saw drunk driving as less dangerous than girls did ($\gamma = .15$). Students with a higher educational level were more likely to have the intention to drink and drive than students in lower levels ($\gamma = .13$). Television news watching ($\gamma = .12$) and music video viewing ($\gamma = -.07$) were indirectly associated with the intention to drive while under the influence: these variables were directly related to the perceived risk of this behavior. More news viewing resulted in a higher perceived risk, more music video viewing was negatively related to risk perception.

4. Discussion

Risky driving is an important threat to young people's health. They are involved in traffic accidents more often than any other age group and they are overrepresented in mortality rates as a result of motor vehicle accidents (BIVV, n.d., p. 16). Although some other forms of risk taking have been associated with media use, the relationship between risky driving behaviors and televi-

sion viewing remained largely unexamined. The results from the current study indicated that more television news viewing was associated with a higher perceived risk of drunk driving and speeding. Music television viewing, on the other hand, was negatively associated with the assessment of the dangers of driving faster than allowed and driving under the influence of alcohol. The viewing of these television genres was related to the intention to speed or drive after consuming alcohol indirectly, via risk perception. Gender explained part of the risk perception variables. Girls regarded speeding and drunk driving as more dangerous than boys did. The more dangerous a particular driving behavior was perceived to be, the less likely respondents intended to exhibit this behavior in the future. These results confirmed our hypotheses.

Contrary to our hypotheses, action movies were not associated with the variables in our models. The significant contribution of this variable disappeared when gender was entered into the model, suggesting a spurious relationship between action movies and perceived risk. The direct relationship between music television viewing and the intention to speed was not hypothesized but proved to be significant in the respecified model. Contrary to what would be expected a higher school level appeared to be associated with a higher intention to drive while you may have had too much alcohol. This finding is surprising and should be addressed in further research.

The results of this study are a matter of concern for several reasons. First, they showed that adolescents already intend to speed or to drive while under the influence even before they obtain their driver's license.

Second, the results provide further evidence of a relationship between music video viewing and risk behavior. This television genre, its program content as well as the advertisements surrounding the program has been described as a source of positive images of alcohol use (DuRant et al., 1997a; Grube and Wallack, 1994; Robinson et al., 1998). Past research (Atkin, 1990; Robinson et al., 1998) has identified a relationship between the viewing of this genre and alcohol use among adolescents. The current findings seemed to suggest a relationship between music video viewing and other forms of risk behavior as well. However, the study did not contain intermediary variables that could explain this relationship. The relationship might be spurious or might be a marker for other causal pathways. The fact that music video viewing has been associated with adolescent risk taking so often suggests that more research is needed.

Several hypothetical explanations can be put forward in order to explain this relationship. First, Cultivation Theory and TpB may provide an explanation of the results in this study. The frequent exposure to traffic accidents in television news may cultivate viewers' perception of reality. Heavy viewers of this genre perceived driving under the influence of alcohol and speeding as being more dangerous than other respondents did. As predicted by the TpB, these attitudes were associated with intentions to perform certain behaviors. This explanation that differences between the content of television news and music videos explains the difference in the direction of the relationship between television viewing and risk perception. However,

no content analyses about the depiction of risky driving in music videos were found in the literature.

Second, even if no reckless driving occurs in music videos, other risk behavior in music videos may be associated with traffic related risk taking. Several authors have argued that different kinds of risk taking co-occur and comprise a pattern of risk-taking (Donovan and Jessor, 1985; Bina et al., 2006). Studies have shown that the viewing of one kind of risk behavior on television may result in the engaging in other kinds of risky behavior if these behaviors share a similar meaning for the adolescent (Krcmar and Greene, 2000). This offers a potential explanation of the process by which the viewing of risk behavior in music videos may result in traffic related risk taking.

Third, it is possible that the viewing of television news or music television is a marker for a particular lifestyle. Research has shown that risk-taking adolescents watched more music television and less news and public affair programs than adolescents engaging in fewer risky behaviors (Klein et al., 1993). Risk takers also differed in their music choices. They preferred heavy metal and punk; but showed no interest in soft rock, gospel or soul (Arnett, 1992b; Klein et al., 1993; Weisskirch and Murphy, 2004). In line with Klein et al. (1993) and Roe (1989) it may be that adolescents prone to risk taking deliberately choose specific media content in order to “satisfy their otherwise unmet needs for positive self-esteem and identity” (Klein et al., 1993, p. 29). Perse (1996) claimed that high sensation seekers prefer different media content compared to adolescents displaying lower levels of sensation seeking. These studies suggested that the causal relationship between media and risk taking may be reversed.

Thus, a first limitation of this study is the fact that the survey data do not allow us to make causal claims. Further investigation should try to provide a clearer understanding of the direction of the relationship between television and risk taking in traffic by exploring it longitudinally. Second, the portrayal of traffic related risk taking in music programs merits further attention. If we know whether or not risky driving is present in music videos, this will clarify the relationship between both concepts. The current research has shown that elements of Cultivation Theory and TpB may explain the association between news and music television viewing and reckless driving. However, not all concepts of TpB were included in the models and ideally all concepts should be tested by using more than one measure. Further research should try to integrate Cultivation Theory and TpB in order to elucidate the mechanisms through which media exposure is related to risk behavior. For the same reason the meanings adolescents attribute to specific risk behaviors should be examined. Third, the present study aimed to examine adolescents' *intentions* to speed and drink and drive. Even though research has shown there is a relationship between intentions and actual behavior in the case of risky driving (De Pelsmacker and Janssens, 2007), the relationship between media exposure and reckless driving remains to be examined.

Regardless of the limitations, this study has several practical implications. First, the results indicated that a risk-taking propensity may be present before adolescents start driving. This finding is of particular interest for prevention campaign planners since it suggests that traffic safety campaigns should promote

safe driving before adolescents develop perceptions, attitudes or intentions regarding driving and that these intentions predate actual driving. Second, the inclusion of music videos into the models has shown the relevance of music video channels for reaching adolescents prone to risk taking.

Acknowledgment

This study was funded by a subsidy from the Flemish Fund for Scientific Research (FWO).

References

- Aish, A.M., Jöreskog, K.G., 1990. A Panel Model for Political Efficacy and Responsiveness: an application of LISREL 7 with weighted least squares. *Qual. Quant.* 24, 405–426.
- Ajzen, I., 1991. The theory of planned behavior. *Org. Behav. Hum. Decision Process.* 50, 179–211.
- Andersson, H., Lundborg, P., 2007. Perception of own death risk. *J. Risk Uncertainty* 34 (1), 67–84.
- Armitage, C.J., Conner, M., 2001. Efficacy of the theory of planned behaviour: a meta-analytic review. *Br. J. Soc. Psychol.* 40, 471–499.
- Arnett, J.J., 1992a. Reckless behavior in adolescence: a developmental review. *Dev. Rev.* 12, 339–373.
- Arnett, J.J., 1992b. Musical preferences and reckless behavior among adolescents. *J. Adolesc. Res.* 7 (3), 313–331.
- Arnett, J.J., 1995. Adolescents uses of media for self-socialization. *J. Youth Adolesc.* 24 (5), 519–533.
- Arnett, J.J., 1996. Sensation seeking, aggressiveness, and adolescent reckless behavior. *Pers. Individual Diff.* 20 (6), 693–702.
- Arnett, J.J., Irwin, C.E., Halpern-Felsher, B.L., 2002. Developmental sources of crash risk in young drivers. *Inj. Prev.* 8 (Suppl. 2), 17–21.
- Arnett, J.J., Offer, D., Fine, M.A., 1997. Reckless driving in adolescence: ‘State’ and ‘trait’ factors. *Accid. Anal. Prev.* 29 (1), 57–63.
- Atkin, C.K., 1990. Effects of televised alcohol messages on teenage drinking patterns. *J. Adolesc. Health* 11 (1), 10–24.
- Baxter, R.L., De Riemer, C., Landini, A., Leslie, L., Singletary, M.W., 1985. A content analysis of music videos. *J. Broadcasting Electron. Media* 29 (3), 330–340.
- Begg, D., Langley, J., Williams, S., 1999. A longitudinal study of lifestyle factors as predictors of injuries and crashes among young adults. *Accid. Anal. Prev.* 31, 1–11.
- Bina, M., Graziano, F., Bonino, S., 2006. Risky driving and lifestyles in adolescence. *Accid. Anal. Prev.* 38, 472–481.
- BIVV Belgisch Instituut voor de Verkeersveiligheid, (n.d.). BIVV verkeersveiligheid Statistieken 2001. Retrieved September 10, 2006, from <http://www.bivv.be/>.
- Borrell, C., Plasencia, A., Huisman, M., Costa, G., Kunst, A., Andersen, O., et al., 2005. Education level inequalities and transportation injury mortality in the middle aged and elderly in European settings. *Inj. Prev.* 11 (3), 138–142.
- Brown, J.D., L’Engle, K.L., Pardun, C.J., Guo, G., Kenneavy, K., Jackson, C., 2006. Sexy media matter: exposure to sexual content in music, movies, television, and magazines predicts black and white adolescents’ sexual behavior. *Pediatrics* 117 (4), 1018–1027.
- Combs, B., Slovic, P., 1979. Newspaper coverage of causes of death. *Journalism Q.* 56 (4), 837–849.
- Connor, S.M., Wesolowski, K., 2004. Newspaper framing of fatal motor vehicle crashes in four midwestern cities in the United States 1999–2000. *Inj. Prev.* 10 (3), 149–153.
- De Pelsmacker, P., Janssens, W., 2007. The effect of norms, attitudes and habits on speeding behavior: scale development and model building and estimation. *Accid. Anal. Prev.* 39 (1), 6–15.
- Diamond, S., Bermudez, R., Schensul, J., 2006. What’s the rap about ecstasy? Popular music lyrics and drug trends among American youth. *J. Adolesc. Res.* 21 (3), 269–298.

- Donovan, J., Jessor, R., 1985. Structure of problem behavior in adolescence and young adulthood. *J. Consult. Clin. Psychol.* 53 (6), 890–904.
- DuRant, R.H., Rich, M., Emans, S.J., Rome, E.S., Allred, E., Woods, E.R., 1995. A content-analysis of tobacco and alcohol-use behaviours on televised music videos. *J. Adolesc. Health* 16 (2), 138–1138.
- DuRant, R.H., Rome, E.S., Rich, M., Alfred, E., Emans, S.J., Woods, E.R., 1997a. Tobacco and Alcohol use behaviors portrayed in music videos: a content analysis. *Am. J. Publ. Health* 87 (7), 1131–1135.
- DuRant, R.H., Rich, M., Emans, S.J., Rome, E.S., Allred, E., Woods, E.R., 1997b. Violence and weapon carrying in music videos—a content analysis. *Arch. Pediatr. Adolesc. Med.* 151 (5), 443–448.
- Dworkin, J., 2005. Risk taking as developmentally appropriate experimentation for college students. *J. Adolesc. Res.* 20 (2), 219–241.
- Engelberg, E., Sjoberg, L., 2005. Perceived reality of visually mediated hazards and beliefs about risk. *Appl. Cognit. Psychol.* 19 (7), 899–912.
- Escobar-Chaves, S.L., Tortolero, S.R., Markham, C.M., Low, B.J., Eitel, P., Thickstun, P., 2005. Impact of the media on adolescent sexual attitudes and behaviors. *Pediatrics* 116, 303–326.
- Frost, K., Frank, E., Maibach, E., 1997. Relative risk in the news media: a quantification of misrepresentation. *Am. J. Publ. Health* 87 (5), 842–845.
- Gidwani, P., Sobol, A., DeJong, W., Perrin, J., Gortmaker, S., 2002. Television viewing and initiation of smoking among youth. *Pediatrics* 110 (3), 505–508.
- Glik, D., Kinsler, J., Todd, W., Clarke, L., Fazio, K., Miyashiro, R., et al., 2005. Unintentional injury depictions in popular children's television programs. *Inj. Prev.* 11 (4), 237–241.
- Greenberg, B.S., Atkin, C.K., 1983. The portrayal of driving on television. *J. Commun.* 33 (2), 44–55.
- Greenberg, B.S., Gregg, J.L., 1998. The portrayal of Safety Belts on Broadcast and Cable Television. Retrieved September 10, 2006, from <http://www.actsinc.org/cableportrayal.cfm/>.
- Greenberg, B.S., Thanki, D., 1997. The Portrayal of Safety Belts In Hollywood Motion Pictures. Retrieved September 10, 2006, from <http://www.actsinc.org/hollywoodportrayal.cfm>.
- Greene, K., Krcmar, M., Walters, L.H., Rubin, D.L., Hale, J., Hale, L., 2000. Targeting adolescent risk-taking behaviors: the contribution of egocentrism and sensation-seeking. *J. Adolesc.* 23, 439–461.
- Greening, L., Stoppelbein, L., 2000. Young drivers' health attitudes and intentions to drink and drive. *J. Adolesc. Health* 27, 94–101.
- Grube, J.W., Wallack, L., 1994. Television beer advertising and drinking knowledge, beliefs, and intentions among school children. *Am. J. Publ. Health* 84, 254–259.
- Gruber, E.L., Thau, H.M., Dill, D.L., Fisher, D.A., Grube, J.W., 2005. Alcohol, tobacco, and illicit substances in music videos: a content analysis of prevalence and genre. *J. Adolesc. Health* 37 (1), 81–83.
- Gutschoven, K., 2004. Adolescents' educational level and computer use: an exploratory study of the relationship between adolescents' current educational level and the use of computer applications and computer attitudes. *Communications* 29, 135–158.
- Harré, N., 2000. Risk evaluation, driving, and adolescents: a typology. *Dev. Rev.* 20 (2), 206–226.
- Jonah, B.A., 1997. Sensation seeking and risky driving: a review and synthesis of the literature. *Accid. Anal. Prev.* 29 (5), 651–665.
- Klein, J.D., Brown, J.D., Childers, K.W., Oliveri, J., Porter, C., Dykers, C., 1993. Adolescents risky behavior and mass-media use. *Pediatrics* 92 (1), 24–31.
- Kone, D., Mullet, E., 1994. Societal risk perception and media coverage. *Risk Anal.* 14 (1), 21–24.
- Krcmar, M., Greene, K., 2000. Connections between violent television exposure and adolescent risk taking. *Mediapsychology* 2, 195–217.
- L'Engle, K.L., Brown, J.D., Kenneavy, K., 2006. The mass media are an important context for adolescents' sexual behavior. *J. Adolesc. Health* 38 (3), 186–192.
- McArthur, D.L., Magana, D., Peek-Asa, C., Kraus, J.F., 2001. Local television news coverage of traumatic deaths and injuries. *Western J. Med.* 175 (6), 380–384.
- Moller, M., 2004. An explorative study of the relationship between lifestyle and driving behaviour among young drivers. *Accid. Anal. Prev.* 36 (6), 1081–1088.
- Nabi, R.L., Sullivan, J.L., 2001. Does television viewing relate to engagement in protective action against crime? A cultivation analysis from a theory of reasoned action perspective. *Commun. Res.* 28 (6), 802–825.
- Palamara, P.G., Stevenson, M.R., 2003. A longitudinal investigation of psychosocial risk factors for speeding offences among young motor car drivers. Retrieved September 10, 2006, from <http://www.irc.uwa.edu.au/docs/RR128.pdf/>.
- Pechmann, C., Shih, C., 1999. Smoking scenes in movies and antismoking advertisements before movies: effects on youth. *J. Marketing* 63, 1–13.
- Pelletier, A.R., Quinlan, K.P., Sacks, J.J., Van Gilder, T.J., Gilchrist, J., Ahluwalia, H.K., 2000. Injury prevention practices as depicted in G-rated and PG-rated movies. *Arch. Pediatr. Adolesc. Med.* 154 (3), 283–286.
- Perloff, R.M., 2003. The dynamics of persuasion. In: *Communication and Attitudes in the 21st Century*. Lawrence Erlbaum Associates, London.
- Perse, E.M., 1996. Sensation Seeking and the use of television for arousal. *Commun. Rep.* 9 (1), 37–48.
- Rai, A.A., Stanton, B., Wu, Y., Li, X., Galbraith, J., Cottrell, L., et al., 2003. Relative influences of perceived parental monitoring and perceived peer involvement on adolescent risk behaviors: an analysis of six cross-sectional data sets. *J. Adolesc. Health* 33 (2), 108–118.
- Rich, M., Woods, E.R., Goodman, E., Emans, E., DuRant, R.H., 1998. Aggressors or victims: gender and race in music video violence. *Pediatrics* 101 (4), 669–674.
- Robinson, T.N., Chen, H.L., Killen, J.D., 1998. Television and music video exposure and risk of adolescent alcohol use. *Pediatrics* 102 (5), e54.
- Roe, K., 1989. School achievement, self esteem and adolescent's video use. In: Levy, M.R. (Ed.), *The VCR Age: Home Video and Mass Communication*. Sage Publications, Beverly Hills, CA.
- Sargent, J.D., Beach, M.L., Dalton, M.A., Mott, L.A., Tickle, J., Ahrens, M.B., et al., 2001. Effect of seeing tobacco use in films on trying smoking among adolescents: cross sectional study. *Br. Med. J.* 323 (7326), 1394–1397.
- Tapper, J., Thorson, E., 1994. Variations in music videos as a function of their musical genre. *J. Broadcasting Electron. Media* 38 (1), 103–114.
- Ulleberg, P., Rundmo, T., 2002. Risk-taking attitudes among young drivers: the psychometric qualities and dimensionality of an instrument to measure young drivers' risk-taking attitudes. *Scand. J. Psychol.* 43 (3), 227–237.
- Van Beurden, E., Zask, A., Dip, S.E.G., Brooks, L., Dight, R., 2005. Heavy episodic drinking predictors of harmful and sensation seeking in adolescents as driving and celebrating behaviors: implications for prevention. *J. Adolesc. Health* 37 (1), 37–43.
- Van den Bulck, J., Beullens, K., Mulder, J., 2006. Television and music video exposure and adolescent 'alcopop' use. *Int. J. Adolesc. Med. Health* 18 (1), 107–114.
- Weisskirch, R.S., Murphy, L.C., 2004. Friends, porn, and punk: sensation seeking in personal relationships, internet activities, and music preference among college students. *Adolescence* 39 (154), 189–201.
- Will, K.E., Porter, B.E., Geller, E.S., DePasquale, J.P., 2005. Is television a health and safety hazard? A cross-sectional analysis of at-risk behavior on primetime television. *J. Appl. Soc. Psychol.* 35 (1), 198–222.
- Wingood, G.M., DiClemente, R.L., Bernhardt, J.M., Harrington, K., Davies, S.L., Robillard, A., Hook, E.W., 2003. A prospective study of exposure to rap music videos and African American female adolescents' health. *Am. J. Publ. Health* 93 (3), 437–439.
- Winston, F.K., Woolf, K.D., Jordan, A., Bhatia, E., 2000. Actions without consequences—injury-related messages in children's programs. *Arch. Pediatr. Adolesc. Med.* 154 (4), 366–369.
- Yanovitzky, I., Stryker, J., 2001. Mass media, social norms, and health promotion efforts—a longitudinal study of media effects on youth binge drinking. *Commun. Res.* 28 (2), 208–239.
- Zuckermann, M., 1994. *Behavioral Expression and Biosocial Bases of Sensation Seeking*. Cambridge University Press, New York.