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Are movies with tobacco, alcohol, drugs, sex, and violence rated for youth?: A comparison of rating systems in Argentina, Brazil, Mexico, and the United States

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Abstract

Background—This study aimed to determine between-country differences and changes over time in the portrayal of youth risk behaviors in films rated for youth in Argentina, Brazil, Mexico and the United States.

Methods—Content and ratings were analyzed for 362 films that were popular across all four countries from 2002–2009. Country-specific ratings were classified as either youth or adult, and Generalized Estimating Equations were used to determine between-country differences in the presence of tobacco, alcohol, drugs, sexual content, and violence in youth-rated films. Within-country differences in this content over time were also assessed, comparing films released from 2002–2005 with those released from 2006–2009.

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Results—In the US, films rated for youth were less likely to contain all five risk behaviors than in youth-rated films in Argentina, Brazil, and, when the "15 and older" rating was considered a youth rating, in Mexico. All three Latin American countries "downrated" films that received an adult rating in the US. Nevertheless, tobacco and drug use in youth-rated films declined over time in all countries, whereas moderate to extreme alcohol use and violence involving children or youth increased in all countries.

Conclusions—Tobacco and drug use have declined in popular US films, but these behaviors are still prevalent in films rated for youth across the Americas. The apparent success of advocacy efforts to reduce tobacco and other drugs in films suggests that similar efforts be directed to reduce alcohol portrayals.

Keywords

youth; risk behaviors; cinema; movie rating systems; policy

INTRODUCTION

Exposure to portrayals of tobacco and alcohol in entertainment media promotes these behaviors among youth (R Hanewinkel et al., 2012; USDHHS, 2012). In the United States (US), advocacy efforts have targeted the US film industry to reduce portrayals of tobacco (USDHHS, 2012; Zolty, 2012) and drug use (Boyd, 2008; Vittala, 2000). Evidence suggests that these initiatives have been relatively successful (Callister et al., 2012; Glantz, Mitchell, Titus, Polansky, & Kaufmann, 2011; J. D. Sargent & Heatherton, 2009; K. A. Worth, dal Cin, & Sargent, 2006); however, little is known about the implications of these declines for other countries where US films are popular. US films that are popular outside of the US may be those that contain more risk behaviors. Indeed, films that get rated for adults in the US (i.e, R-rated) contain more risk behaviors and are likely to receive youth ratings in other countries (Anderson, Millett, Polansky, & Glantz, 2010; Reiner Hanewinkel et al., 2013). In order to inform policy development to limit movie portrayals that promote risk behaviors, the current study analyzed risk behavior content for films that were popular in the Argentina, Brazil, Mexico and the US, their relationship with country-specific ratings, and changes in this content over time.

Background

In 2008, the United States 'National Cancer Institute concluded that smoking in movies is a significant cause of adolescent smoking. This conclusion was based on observational and experimental studies in the US (Dalton et al., 2003; Distefan, Gilpin, Sargent, & Pierce, 1999; Distefan, Pierce, & Gilpin, 2004; Pechmann & Shih, 1999; J. D. Sargent et al., 2005; J. D. Sargent et al., 2001; J. D. Sargent et al., 2002; Jennifer J. Tickle, Hull, Sargent, Dalton, & Heatherton, 2006; J. J. Tickle, Sargent, Dalton, Beach, & Heatherton, 2001) but has since received support from research in European countries (R. Hanewinkel, Morgenstern, Tanski, & Sargent, 2008; Reiner Hanewinkel & Sargent, 2007; Hunt, Henderson, Wight, & Sargent, 2011; Morgenstern et al., 2011; Wilkinson et al., 2009), Mexico (Thrasher, Jackson, Arillo-Santillan, & Sargent, 2008; Thrasher et al., 2009) and India (Arora et al., 2012). To address this issue, the World Health Organization's Framework Convention on Tobacco Control

(WHO-FCTC) recommends comprehensive bans on tobacco advertising, promotion and sponsorship, including “all forms of commercial communication…with the aim, effect or likely effect of promoting a tobacco product or tobacco use”(WHO, 2009). The 187 countries that are Party to the WHO-FCTC have increasingly prohibited tobacco marketing through traditional channels, like television and print advertising (WHO, 2011b). The impact of film smoking exposure on youth smoking appears to strengthen after direct tobacco marketing is banned and films and other entertainment media become the primary vehicle for youth exposure to smoking imagery in mass media (Reiner Hanewinkel & Sargent, 2008; Heatherton & Sargent, 2009; Thrasher et al., 2009). The WHO-FCTC recommends giving an adult rating to films with tobacco portrayals (WHO, 2011a), and policy development in this area will benefit from more research on how current rating systems are associated with tobacco use portrayals and other youth risk behaviors.

Most films that are rated as appropriate for youth contain smoking, whether the film is rated in the US (Jennifer J. Tickle, Beach, & Dalton, 2009), Brazil (RC Vargas, Thrasher, & Sargent, 2011), or European countries (Anderson et al., 2010; Reiner Hanewinkel et al., 2013). Films that contain smoking are more likely to be rated for youth in European systems compared to the US system (Anderson et al., 2010; Reiner Hanewinkel et al., 2013) because films rated for adults in the US system are often “downrated” to have youth ratings in Europe (Anderson et al., 2010; Reiner Hanewinkel et al., 2013). This downrating is not because the US system emphasizes smoking; rather, it appears to be due to greater tolerance of sexual content in the European systems, along with a possible correlation between the portrayal of smoking and of sex and other youth risk behaviors (Jennifer J. Tickle et al., 2009). However, no study has systematically compared how rating systems treat the youth risk behaviors that may co-occur with smoking, such as drug use, alcohol use, sex, and violence.

In the US, legislation prohibiting tobacco industry payoffs for product placements in films (USDHHS, 2012), monitoring of tobacco portrayals in films, and pressure from smoke-free movie advocacy groups appears to account for declines in smoking content in US-produced films (J. D. Sargent & Heatherton, 2009; K. A. Worth et al., 2006), with some evidence suggesting accelerated declines after 2005 (Glantz et al., 2011). These decreases should result in lower smoking content in countries where US-produced films are popular, such as Latin American countries. However, these decreases may be offset by the “downrating” of R-rated films that contain the highest levels of smoking. The degree of concordance between the US and Latin American rating systems with respect to tobacco and associated youth risk behaviors is unknown. It is also unknown whether the portrayal of other risky behaviors has changed over time, although teenage drug use portrayals appear to have declined in US-produced films (Callister et al., 2012).

Early onset of alcohol use and youth binge drinking in the US and Europe has been associated with exposure to alcohol use in movies (Dal Cin et al., 2009; R Hanewinkel & Sargent, 2009; R Hanewinkel et al., 2012; R Hanewinkel, Tanski, & Sargent, 2007; J. Sargent, Wills, Stoolmiller, Gibson, & Gibbons, 2006; Stoolmiller et al., 2012). The WHO has not identified alcohol use in films as a specific target for policy development (WHO, 2010); however, support for prohibiting industry promotions through entertainment media is

implied by the WHO's focus on regulating alcohol marketing activities that reach youth, including indirect marketing (i.e., marketing through a third party). Nevertheless, we are unaware of any policy initiatives to limit youth exposure to alcohol imagery in films. Furthermore, film rating systems in the Argentina, Brazil, Mexico and the US do not take tobacco or alcohol use images into account when determining the age-appropriateness of films (see Table 1).

The current study examined how a large sample of contemporary movies were rated in Argentina, Brazil, Mexico, and the US, in order to better understand how between-country differences in rating systems affects potential youth exposure to these risk behaviors in each country. Our study posed the following questions: 1. Are films that portray tobacco, alcohol, drugs, violence, and nudity more likely to be rated for youth in Latin American countries than in the US?; 2. Are films rated for adults in the US (i.e., R-rated) rated for youth in Latin American countries?; and 3. In films rated for youth, have tobacco and other youth risk behavior content decreased over the last decade within study countries? The results aim to inform policy development to reduce media effects on youth risk behaviors.

METHODS

Box office data from Argentina, Brazil, Mexico, and the US were used to determine the top grossing films in each year, from 2002 through 2009 (although we only obtained data on the top 50 grossing films for Brazil for 2002). US-produced films accounted for between 75% and 86% of all films on each country's list. From these films, we selected the 362 films on the lists for all four countries as the analytic sample, which included a median of 48.5 films for each year (range=30 to 50; the lowest number was from 2002, when the sampling frame was limited to only the top 50 films that were popular in Brazil).

Movie ratings

Each country's rating system is different, using four to six categories (see Table 1) (DOJ, 2008; MPAA, 2011; SG, 2002). A film was classified for youth if the rating indicated appropriateness for youth up to 14 years old. The "16 and older" category for Argentina and Brazil was treated as an adult rating, as was the "17 and older" US category. The "15 and older" rating in Mexico was analyzed as both a "youth" rating and an "adult" rating to determine the sensitivity of study results to our coding.

Content coding of movies

The Dartmouth Media Research Laboratory (DMRL) uses a reliable methodology for coding the content of the top 100 grossing films in the US each year (J. Sargent, Worth, & Beach, 2008; KA Worth, Tanski, & Sargent, 2006). Films contained tobacco content if any tobacco product was visible. Alcohol content (i.e., beer, wine, liquor) was similarly assessed, with coders also providing a global assessment of the salience of alcohol use (i.e., no alcohol; not salient; minimally salient; moderately salient; extremely salient). Alcohol salience was dichotomized to reflect moderate or extreme salience compared to lower salience. Alcohol intoxication, male nudity (i.e., bare buttocks or full frontal nudity), and female nudity (i.e., bare buttocks, bare breasts, or full frontal nudity) were each coded as present or not.

Portrayal of different drugs (e.g., marijuana, cocaine/crack, LSD/hallucinogens, heroin/opiates, inhalants, club drugs) and drug intoxication were assessed, from which any drug use portrayal was determined. Different violent content was assessed (e.g., action-related, horror-related, sadistic, and interpersonal violence), along with a global assessment of its salience (none; minimal; moderate; frequent). We analyzed whether violence was salient (i.e., moderate or frequent vs. less salient) and whether any minors were involved in interpersonal violence (i.e., any depiction of the actual use of force which physically harms another person or group of people as well as any credible threat of physical force intended to harm another), whether as a perpetrator or victim. For the 10% of all films in the DMRL database that have been double-coded, inter-rater reliability was generally good (Krippendorf's alpha range = 0.70 to 0.87), with lower levels found for male nudity and a minor's involvement in interpersonal violence (alpha=0.63 and 0.50, respectively). When coding discrepancies were found for double-coded films, a third party familiar with the coding scheme worked with the coders to reach a consensus.

ANALYSES

Data were analyzed using Stata, version 11. Within each country, we examined the distribution of country-specific ratings for films in both the analytic sample and country-specific sampling frame. To compare our analytic sample with the larger sampling frame, we used the large sample version of the two-sample test of proportions to determine whether the likelihood of receipt of a youth rating differed across the two samples. We linked films in the analytic sample to the DMRL database. Generalized estimating equation (GEE) models were estimated to determine the likelihood of a film receiving youth rating and to determine between-country differences in the presence of risk-behavior content in youth-rated films (the GEE model specifically addresses the correlation of the repeated ratings for each individual movie). We were specifically interested in whether there was a differential impact of a film's behavioral content on a country's likelihood of rating a film as appropriate for youth. A separate logistic GEE model was estimated to assess this association for each behavior. In each case, we modeled the likelihood of receiving a youth rating according to the country's rating system. Dummy variables were developed for each combination of the behavior being present or not for each country (e.g., smoking and Argentina; nonsmoking and Argentina), with the presence of the behavior and the US serving as the referent combination. Hence, the resulting coefficients assessed whether the likelihood of receiving a youth rating was significantly different from when a film contained the behavior in the US.

Finally, we tested within-country changes in the prevalence of youth risk behaviors from the earlier period (2002–2005) to the later period of observation (2006–2009), because other studies indicate declining portrayals of tobacco in US-produced films (Glantz et al., 2011). Within country analyses of change over time involved stratifying films into "youth" and "adult" rating strata and conducting chi-square tests to assess the difference in the prevalence of each behavioral indicator in the two time periods.

RESULTS

Figure 1 shows the distribution of the ratings for films in the analytic sample (n=362) and country-specific sampling frames for top grossing films from 2002–2009. The percentage of films in any particular rating category is generally consistent across the analytic sample and sampling frame in Argentina, Brazil and the US (i.e., within 2–4%). For Mexico, the analytic sample had a lower percentage of films rated “15 and older” than in Mexican sampling frame (18% vs. 27%, respectively), whereas the reverse was true for films rated for audiences “13 and older” (45% vs. 36%, respectively). Assessment of differences in the likelihood of receiving a youth rating across the analytic sample and sampling frame indicated that the only statistically significant difference was for Mexico, and only when the “15 and older” category was excluded from the youth rating category (p=0.002), not when it was included as a youth rating (p=0.99).

When examining films rated for adults in the US (i.e., R-rating; n=101), evidence for “downrating” was found in all three countries (see Figure 2). In Argentina, about 2/3 (i.e., 63%) of R-rated films were rated “13 or older,” and most of the remaining films (i.e., 33%) were given a “16 or older” rating. One R-rated film (i.e., 1%) was rated as appropriate for all audiences and three films (3%) were given an “18 or older” rating. Similar results were found for the Brazilian system, with 8% of R-rated films given an “all ages” (n=3) or “12 or older” rating (n=5); 40% rated as for “14 or older”; 41% rated for “16 or older”; and 10% given an “18 or older” rating. In Mexico, almost half (i.e., 46%) of the R-rated films received a “15 or older” rating. The remaining R-rated films were evenly divided between those given a “13 or older” rating (i.e., 27%) and an “18 or older” rating (27%).

When examining ratings for the 205 films that contain tobacco (i.e., 57% of 362 films), 62% were rated for youth in the US, which was lower than in Argentina (82%) and Brazil (76%). In Mexico, the percentage varied depending on whether Mexico’s “15 and older” category was considered a youth (87%) or adult rating (65%). Examination of interaction terms in GEE models indicated that a film portraying tobacco was more likely to get a youth rating in Argentina ($p<0.001$) and Brazil ($p<0.001$) than in the US, with significant differences between the US and Mexico found only when films originally rated as “15 and older” were considered rated for youth. The same pattern of results was found when examining the likelihood of receiving a youth rating when any of the other youth risk behaviors was present, when comparing the US with Argentina, Brazil, and Mexico when films given Mexico’s “15 and older” rating are classified as having a youth rating (see Table 2). When the “15 and older” films were classified as having an adult rating, the only statistically significant difference between Mexico and the US concerned the greater likelihood in Mexico of getting a youth rating when a film portrayed drug use (52% vs. 38%, respectively; p=0.03) or showed female nudity (40% vs. 28%, respectively; $p<0.001$).

Finally, we tested within country differences in the prevalence of each behavior of interest from the earlier period (2002–2005, n=177 films) to the later period (2006–2009, n=185 films). For youth-rated films, the prevalence of tobacco use decreased within all four countries (Argentina = 59% to 48%, $p<0.001$; Brazil = 59% to 41%, $p<0.001$; Mexico = 58% to 44%, $p<0.001$; US = 56% to 42%, $p<0.001$). The prevalence of portraying any drug

use and drug intoxication also decreased significantly in youth-rated films within each country (Argentina = 17% to 8% and 10% to 2%, respectively; Brazil = 16% to 4% and 9% to 1%, respectively; Mexico with “15 and older” as youth rating = 19% to 6% and 11% to 2%, respectively; Mexico with “15 and older” as adult rating = 18% to 3% and 10% to 1%, respectively; US = 12% to 4% and 8% to 1%, respectively). Consistent increases within all countries were also found in the percentage of youth-rated films with moderate or extremely salient portrayals of alcohol (i.e., range for 2002–2005 period = 19% – 22%; range for 2006–2009 period = 28% to 30%) and violence involving adolescents or children (i.e., range for 2002–2005 period = 16% – 18%; range for 2006–2009 period = 24% to 27%). In youth-rated films, female nudity also declined over these two periods for all countries except Argentina.

DISCUSSION

Tobacco was portrayed in 57% of the 362 films we analyzed, and the majority of these films were rated as appropriate for youth in all countries studied (range = 62% to 87%). As in European countries (Anderson et al., 2010; Reiner Hanewinkel et al., 2013), the likelihood that a film with tobacco received a youth rating was higher in Argentina (82%) and Brazil (76%) than in the US (62%). Similar results were found when Mexican films that received a “15 and older” rating were considered to have a youth rating (87%); however, the US and Mexico were no different from each other when films in this rating category were considered to have an adult rating (65%). As expected, these differences between Latin American countries and the US appear partly due to the “downrating” of films that are rated for adults in the US and that contain more smoking than youth-rated films. The majority of popular films that receive an adult rating in the US are given ratings for youth who are 15 or younger in Argentina, Brazil and Mexico (i.e., 64%, 48%, and 72%, respectively). Indeed, films with tobacco content were more likely to get a youth rating in Argentina and Brazil than in the US, in spite of the fact that we used a lower age threshold for adult ratings in Argentina and Brazil than in the US (i.e., “16 or older” vs. “17 or older”).

The same pattern of results was found for portrayals of alcohol use, drug use, violence and nudity, suggesting that rating systems in Argentina, Brazil and Mexico treat *all* of these behaviors more leniently than the US system does. Rating systems in all four countries explicitly consider all these behaviors, except alcohol and tobacco use (see Table 1), the two behaviors for which research provides the strongest evidence for a causal effect of movie exposure. Previous research has suggested that European rating systems treat sexual content more liberally than the US system (Anderson et al., 2010; Reiner Hanewinkel et al., 2013), and that the correlation between sex and tobacco accounts for the greater likelihood that youth-rated films contain tobacco in Europe. Our study suggests that Latin American rating systems are not only more liberal in their treatment of sexual content, but also in their treatment of drug use and violence. Future research should determine whether our results apply to non-US made films that are popular in these countries, including domestically produced films, which account for approximately 10% of popular films each year in Argentina, Brazil and Mexico. This may also require more reliable coding of male nudity, which was lower than desired (alpha=0.63).

The linkage between smoking and other youth risk behaviors may explain why popular European-, Argentine-, and Brazilian-made films rated for youth appear to contain more smoking than US-produced films that receive youth ratings (Reiner Hanewinkel et al., epub online; Mejia et al., under review; Rosa Vargas, 2011). Nevertheless, tobacco industry involvement in national film industries should be assessed. Monitoring of industry behavior in Hollywood likely potentially makes non-US domestic movie markets more attractive for tobacco placements and promotions, in spite of their smaller reach than US-produced films. Whatever the potential influence of domestically produced films on youth tobacco use and other risk behaviors, their importance in terms of exposure is likely to be limited compared to the US-produced films that dominate the film market in our study countries.

Tobacco use in youth-rated films decreased significantly from 2002–2005 to 2006–2009, whether in Argentina (59% to 48%), Brazil (59% to 41%), Mexico (62% to 44% or 58% to 44%, with the “15 and older” rating as youth or adult, respectively) or the US (56% to 42%). Hence, it appears that the downrating of films rated for adults in the US has not overwhelmed the benefits of general decreases in tobacco portrayals in US films (Glantz et al., 2011; J. D. Sargent & Heatherton, 2009; K. A. Worth et al., 2006). Smoking in US-produced adult-rated films in the US (i.e., rated R) decreased between 1994 and 2004 (K. Worth, Tanski, & JD, 2006), which suggests that broader social trends regarding the social acceptability of smoking may help explain declines in exposure. Our study suggests that in spite of significant reductions in youth-rated films across all countries, this trend has stalled for films rated for adults in the US (2002–2005 = 79% vs. 2006–2009 = 77%). Nevertheless, it appears that the decreased portrayal of tobacco use in youth-rated films in the US has produced similar declines in films rated for youth in Argentina, Brazil and Mexico. These results are likely to generalize to other countries where consumption of US-produced films is strong. Furthermore, portrayals of any alcohol use, alcohol intoxication, moderate or extreme violence, and male nudity in films rated for youth did not significantly change in countries over the two time periods considered. The specificity of reductions in tobacco portrayals provides further evidence that these are likely due to the efforts of advocacy groups and of general declines in the social acceptability of smoking (J. D. Sargent & Heatherton, 2009).

Although any alcohol use and alcohol intoxication did not significantly change over time, moderate to extreme alcohol use increased in youth-rated films in all countries (i.e., Argentina, 22% to 29%; Brazil, 21% to 30%; Mexico, 21% to 28% or 22% to 29%, with the “15 and older” rating as youth or adult, respectively; US, 19% to 28%). This is troubling given intensive alcohol industry marketing towards youth (Mart, 2011) and the public health burden of alcohol use and abuse, which the WHO has identified as the third most important risk factor globally for life years lost (WHO, 2010). Future research should assess alcohol brand appearances in entertainment media to better understand which companies may be promoting such changes, while providing evidence that may be useful for efforts to prohibit alcohol industry payoffs for product placement. Advocacy efforts should also consider integrating portrayals of extreme alcohol use into the rating systems for movies and other entertainment media.

Consistent with recent research (Callister et al., 2012), this study found that depictions of drug-related content decreased in youth-rated films, extending these findings to rating systems in major Latin American countries. As with tobacco, this decline could reflect broader societal trends, since illicit drug use among 12-to-17-year olds in the US declined significantly between 2002 and 2010 (lifetime use from 31% to 26%, respectively) (SAMHSA, 2011). Declines in film portrayals of drug use may have resulted from partnerships between the US film industry and the US government to deglamorize depictions of substance use in film. The Entertainment Industries Council (EIC) and National Institute on Drug Abuse (NIDA) have collaborated since the 1980s, publishing industry guidelines for depicting substance use and addiction in films, presenting annual awards for the most accurate film portrayals of substance use, and providing "script-to-screen" services for both established and budding film writers (Boyd, 2008; Vittala, 2000). Portraying the negative consequences of substance use is an important aspect of this program, as such portrayals may help prevent youth drug use behavior by promoting negative outcome expectancies. Along similar lines, the WHO-FCTC recommends the inclusion of anti-smoking ads in movies where tobacco use is portrayed (WHO, 2011a), and India has implemented this policy (Kounteya Sinha, 2012). Nevertheless, the effectiveness of these and similar policies should be further studied.

Our results also suggest that in all countries, salient portrayals of violence involving children or adolescents and of alcohol use have increased in youth-rated films over the last decade. Increasing appearances of alcohol brands in US-produced films suggests that the alcohol industry may account for this change and that it deserves consideration for policy development (Bergamini, Demidenko, & Sargent, under review). Violence sells movies, and films with moderate or extremely salient portrayals of violence are commonly rated for youth in all countries studied (range 73% to 81%). The increase in youth violence may be a "rebound" after violence decreased dramatically in 1999, after adolescent-perpetrated violence received increased media attention in the US (i.e., Columbine) and the US legal system actively called upon US movie industry representatives to testify regarding the role of movies in accounting for this violence. The current increase may simply be due to trending back to the mean before this event. Future studies should examine violence in greater depth using more reliable measures, as our measure had relatively low inter-rater reliability. This may require separating out physical harm from the threat of physical harm, as both were included in our definition.

The current study is limited by a number of issues, including potential biases associated with the selection of films for analysis. Approximately half of the top grossing films from 2002 to 2009 were selected for the analytic sample, and these films were all US-produced. European-produced films that are rated for youth in Europe include more smoking than US-produced films (Reiner Hanewinkel et al., 2013), as appears to happen in Brazilian-produced films (Rosa Vargas, 2011) and Argentine-produced films (Mejia et al., under review). Hence, if our assessment is biased, it may have underestimated the amount of tobacco portrayals in films rated for youth in the Latin American countries studied. Nevertheless, US-produced films dominate film markets in Argentina, Brazil and Mexico, and domestically-produced films comprise about 1 in 10 (i.e., 8%, 11%, and 8%, respectively) of the top-grossing films in our sampling frame. Hence, our analytic sample is likely to account

for a significant proportion of movie exposure. Furthermore, the analytic sample was just as likely to include films rated for youth as the sampling frame from which these films came. The only exception was in Mexico, for which the analytic sample was less likely to contain films rated for youth when films with a “15 or older” rating were considered for adults. Future research should focus specifically on this rating category, as study results often varied depending on whether it was considered as an adult or youth rating. Other research should also aim to overcome any biases in the selection of films by content analyzing all top grossing films, as well as by further study of the relationship between movie content exposure and youth risk behaviors.

The rating systems we analyzed were not entirely comparable across countries, particularly when considering the threshold for adult-rating status. Nevertheless, we found that films with tobacco were more likely to get youth ratings in Argentina and Brazil, even when using the more liberal designation of films as having adult ratings when they were deemed as appropriate for audiences “16 or older” in Argentina and Brazil, compared to “17 or older” in the US. Similar results were found for Mexico only when films rated for audiences “15 or older” were considered youth rated, but not when this category was considered for adults. Policy development should consider where age-related thresholds are placed and whether ratings influence youth exposure to media content. Future research should address these issues, as exposure to content in adult-rated films may differ significantly across countries due to issues like the ready availability of pirated DVDs and internet downloads.

This study provides the first evidence of which we are aware that films that portray tobacco and other youth risk behaviors are more likely to be rated as appropriate for youth in middle-income countries compared to the US. Recent decreases in the portrayal of tobacco use in US-produced films appears likely to account for similar declines in countries where such films are popular, even though films that receive an adult rating in the US and which contain more smoking than youth-rated films often receive youth ratings in other countries. Nevertheless, tobacco portrayals are common in youth-rated films, suggesting that further policy development will be necessary to meet WHO-FCTC guidelines for eliminating these portrayals. When combined with recent evidence on the effects of exposure to alcohol imagery among youth, recent increases in moderate or extreme alcohol use in youth-rated films suggests that policy development is needed to restrict these portrayals or youth exposure to them. High levels of public concern about youth media consumption and support for stronger ratings (MOJ, 2008) may facilitate social acceptance of policy development in this area.

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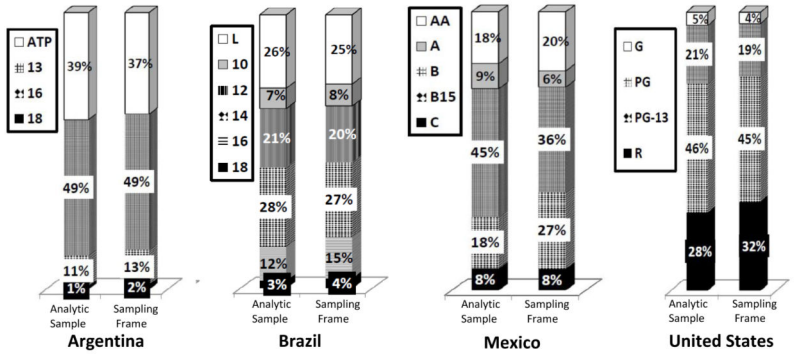

Figure 1. Ratings for popular films in the analytic sample* and in the larger sampling frame by country, 2002–2009

*analytic sample comprised the same 362 films that were popular across all four countries from 2002 to 2009; sampling frame comprised the top 100 films in each year (except n=50 for Brazil in 2002), based on country-specific box office earnings. Comparative analyses categorized films as rated for youth aged under 16 in Argentina (i.e., ATP or 13) and Brazil (i.e., L, 10, 12 or 14), under 17 in the United States (i.e., R), with youth-rated films in Mexico analyzed as both including and not including the rating as suitable for youth 15 and older (i.e., B15).

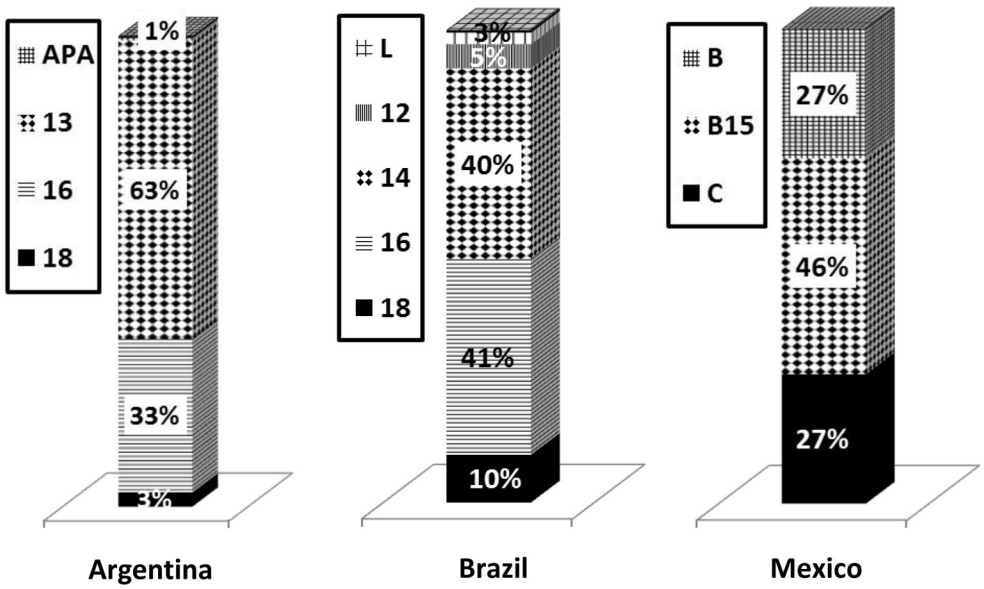

Figure 2. Argentinian, Brazilian and Mexican ratings for films that are rated for adults (i.e., R-rated) in the US

*analytic sample comprised the same 101 films that were popular across all four countries and rated for adults (i.e. R rated) by the US rating system, from 2002 to 2009. See Table 1 for rating descriptions

Table 1

Rating systems, age appropriateness, and rating definitions in four countries

Age	Argentina	Brazil	Mexico	United States
1 to 7	**ATP**: General audiences. May contain mild violence, language and mature situations.	**L:** General Audiences. No objectionable content and can be viewed by anyone, regardless of age	**AA:** General Audiences. Little to no violence, offensive language, or drug abuse. Sexual content limited to mild affection.	**G:** General Audiences. Little to no violence or offensive language. No nudity, sex scenes or drug use.
7 to 10			**A:** Ages 7 and older. Minimal or no violence, sexual or drug use content.	**PG:** Parental Guidance Suggested. May have some profanity, depictions of violence, or brief nudity. No drug use.
10 to 11		**10:** Ages 10 and older. Violent content or inappropriate language for children, even in small amounts (verbal descriptions of licit drugs use and "drug traffic").		
12		**12:** Ages 12 and older. May contain physical aggression, drug use, sexual insinuation (verbal aggression, violence description, licit drug use induction, veiled nudity, sexual language, sex simulation, murder or mistreatment of animals).	**B:** Ages 12 or over. Parental guidance suggested. Minimal, non-extreme violence. Sex only implied. Nudity might be present, but not erotic or degrading. Drug use allusions, but not actual consumption or condoning or glorifying drug abuse. Language may be coarse, but no verbal violence.	
13	**13:** Ages 13 and older. May contain moderate violence, mild sexual content and mature situations.			**PG-13:** Ages 13 and older. May go beyond the PG rating in violence, nudity, sexuality, language, and activities related to a mature theme. May contain drug use and nudity that is not sexually oriented.
14		**14:** Ages 14 and older. May contain more violent content and/or heavy sexual language (murder, agony, verbal descriptions or insinuation of illegal drug use, obscenity, sexual harassment, nudity)		
15				
16	**16:** Ages 16 and older. May contain stronger violence, sex and coarse language.	**16:** Ages 16 and older. May contain more violent content or more intense sexual content, with scenes of torture, suicide, rape or nudity (children or adolescents involved in drug licit use or sale, illicit drug use, no explicit sexual intercourse, abortion, mutilation)	**B-15:** Ages 15 or older. More explicit content than B rating, but extreme violence, explicit sexual content, drug abuse (or scenes of drugs being glorified), and verbal violence is still prohibited.	
17				**R:** Ages 17 and older. May include adult themes, adult activity, hard language, intense or persistent violence, sexually-oriented nudity, drug abuse or elements.
18+	**18**: 18 and older. Strong violence, sex and coarse language	**18:** Ages 18 and older. May contain extreme sexual content and violence, explicit sex, incest, or frequent torture, mutilation or sexual abuse (pedophilia, children involved in illicit drug use or sale)	**C:** High degree of violence (including cruelty), sexual content, and/or drug abuse/references. Verbal violence and offensive language is permitted, but only for narrative purposes.	**NC-17:** 18 and older. Extreme violence, sex, aberrational behavior, drug abuse or other content that most parents would consider off-limits for their children

For this study, films were considered adult-rated if they were rated 16 or 18 in Argentina and Brazil; C & C or B-15 in Mexico (analyzed both ways); and R in the US. Films were considered youth rated if they were rated as ATP or 13 in Argentina; L, 10, 12 or 14 in Brazil; AA, A or B & AA, A, B or B-15 in Mexico (analyzed both ways), and G, PG, or PG-13 in the US.

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Table 2

Percentage of films rated for youth when specific behavioral content is present or absent, by country

Behavioral content	Presence (n=films)	Argentina %	Brazil %	Mexico[1] %	Mexico[2] %	United States %
Tobacco (any)	No (n=157)	94%	95%	84%	99%	86%
	Yes (n=205)	82%[c]	76%[c]	65%	87%[c]	62%
Alcohol (any)	No (n=62)	92%	92%	79%	97%	82%
	Yes (n=300)	87%[c]	83%[c]	72%	91%[c]	70%
Alcohol (moderate or extreme)	No (n=267)	88%	85%	76%	93%	74%
	Yes (n=95)	86%[c]	82%[c]	66%	88%[c]	65%
Alcohol Intoxication	No (n=249)	89%	87%	77%	97%	76%
	Yes (n=113)	84%[c]	78%[c]	65%	91%[c]	63%
Drugs (any)	No (n=309)	90%	89%	77%	95%	78%
	Yes (n=53)	74%[c]	58%[c]	52%[a]	74%[c]	38%
Drug Intoxication	No (n=334)	89%	87%	75%	93%	75%
	Yes (n=28)	68%[c]	56%[a]	50%	73%[c]	39%
Violence (moderate or extreme)	No (n=73)	95%	99%	93%	97%	90%
	Yes (n=289)	86%[c]	81%[c]	69%	91%[c]	67%
Violence with youth involvement	No (n=280)	88%	86%	75%	93%	74%
	Yes (n=82)	88%[c]	78%[c]	67%	89%[c]	66%
Male nudity	No (n=295)	89%	88%	78%	95%	77%
	Yes (n=67)	81%[c]	70%[c]	54%	80%[c]	51%
Female nudity	No (n=287)	92%	91%	82%	96%	83%
	Yes(n=75)	72%[c]	59%[c]	40%[c]	75%[c]	28%

[1] 15 and older rating treated as adult

[2] 15 and older rating treated as youth

[a] $p<0.05$;

[b] $p<0.01$;

[c] $p<0.001$; statistical significance reflects results from GEE models to estimate differences in the prevalence of youth ratings for films that contain the behavior(s) in the country when compared to the same prevalence in the US.

Table 3

Prevalence over time of different behaviors in youth- and adult-rated films by country, 2002–2005 & 2006–2009

Behavior	Rating	Argentina		Brazil		Mexico[1]		Mexico[2]		United States	
		2002–2005	2006–2009	2002–2005	2006–2009	2002–2005	2006–2009	2002–2005	2007–2009	2002–2005	2007–2009
Tobacco (any)	*Youth*	59%	48%[c]	59%	41%[c]	58%	44%[c]	62%	48%[c]	56%	42%[c]
	Adult	82%	77%	95%	80%[b]	89%	66%[c]	93%	92%	79%	77%
Alcohol (any)	*Youth*	84%	80%	83%	80%	84%	80%	85%	80%	81%	80%
	Adult	86%	94%	95%	89%	89%	86%	86%	100%[b]	93%	85%[a]
Alcohol (moderate or extreme)	*Youth*	22%	29%[b]	21%	30%[c]	21%	28%[a]	22%	29%[b]	19%	28%[c]
	Adult	21%	41%[b]	26%	31%	29%	37%	29%	50%[a]	28%	38%[a]
Alcohol Intoxication	*Youth*	29%	31%	29%	29%	28%	28%	30%	29%	26%	29%
	Adult	36%	47%	42%	46%	43%	40%	43%	64%[a]	42%	42%
Drugs (any)	*Youth*	17%	8%[c]	16%	4%[c]	18%	3%[c]	19%	6%[c]	12%	4%[c]
	Adult	36%	24%	53%	34%[b]	29%	25%	36%	57%[a]	38%	27%[a]
Drug Intoxication	*Youth*	10%	2%[c]	9%	1%[c]	10%	1%[c]	11%	2%[c]	8%	1%[c]
	Adult	21%	18%	37%	14%[c]	20%	11%[a]	21%	29%	21%	13%[a]
Violence (moderate or extreme)	*Youth*	75%	81%[b]	76%	77%	75%	76%	78%	81%	73%	76%
	Adult	93%	88%	95%	100%[b]	91%	97%[a]	86%	100%[b]	89%	98%[c]
Violence with youth involvement	*Youth*	18%	27%[c]	18%	24%[a]	16%	26%[c]	18%	26%[c]	16%	25%[c]
	Adult	29%	12%[b]	32%	31%	34%	25%[a]	43%	21%[a]	28%	25%
Male nudity	*Youth*	15%	19%	15%	15%	14%	13%	16%	17%	10%	16%[a]
	Adult	29%	29%	37%	34%	31%	33%	43%	50%	34%	31%
Female nudity	*Youth*	18%	16%	20%	10%[c]	16%	7%[c]	21%	14%[c]	10%	6%[b]
	Adult	54%	35%[a]	58%	54%	57%	42%	64%	64%	55%	50%

[1]15 and older rating treated as adult

[2]15 and older rating treated as youth

[a]p<0.05;

[b]p<0.01;

[c]p<0.001; statistical significance reflects within country differences in the prevalence over time.

Sample sizes for films in the youth and adult rating categories were constant for Argentina (2002–2005: 149 youth- & 28 adult-rated films; 2006–2009: 168 youth- & 17 adult-rated films), Brazil (2002–2005: 159 youth- & 19 adult-rated films; 2006–2009: 136 youth- & 35 adult-rated films), Mexico[1] (2002–2005: 125 youth- & 35 adult-rated films; 2006–2009: 126 youth- & 56 adult-rated films), Mexico[2] (2002–2005: 146 youth- & 14 adult-rated films; 2006–2009: 169 youth- & 13 adult-rated films), and the US (2002–2005: 129 youth- & 57 adult-rated films; 2006–2009: 130 youth- & 44 adult-rated films)