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Original Article

Violence, Sex, and Profanity in Films: Correlation of Movie Ratings With Content

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Abstract and Introduction

Abstract

Context: Children's exposure to violence, sexual themes, profanity, and the depiction of substances in movies remains a source of parental and public health concern. However, limited research quantifies the correlations between movie content, ratings, and economics or addresses the issue of ratings "creep."

Objectives: To characterize available information about violence, sex, and profanity content of movies as a function of rating; quantitatively explore the relationships between content, ratings, and economic information; compare the amount of violence in animated and non-animated G-rated films; and test for a trend of decreased stringency of rating criteria (ie, "ratings creep") as a function of time.

Design: We developed a complete database of movie ratings available from the [Motion Picture Association of America](#) (MPAA) to characterize the content information (including any indicated reasons noted for ratings) for all movies released between January 1, 1992 and December 31, 2003. We then added to the database the three [Kids-in-Mind](#) content-based scores for: (1) violence and gore, (2) sex and nudity, and (3) profanity; and the 15 categories of information from [Screen It!](#), which began providing information in mid-1996. Finally, we obtained information on gross revenues and movie budgets from the [IMDbPro](#). We performed statistical analyses to correlate the content-based scores with the overall rating and rating reasons assigned by the MPAA; to test the hypothesis that age-based ratings became less stringent over time; to explore correlations between film content, ratings, and available economic information; to compare the amount of violence in animated and non-animated G-rated films; and to characterize the available information about the depiction of substances in films.

Main Outcome Measures: Description of movie ratings, correlation of content with rating, and statistical results.

Results: Comparing the content-based scores for different movie ratings, we find large variability exists in the types of content that receive different MPAA ratings, and good correlation between the content-based scores assigned by Kids-in-Mind and Screen It! The MPAA rating reasons correlate with higher scores assigned to content-based ratings, and the number of reasons indicated increases with the age-based rating category. We found significantly higher rated content in movies as a function of time, suggesting that the MPAA applied less stringency in its age-based ratings over time for the period of 1992-2003. Animated films rated G by the MPAA received a significantly higher content-based score for violence on average than non-animated films rated G ($P < .05$). With respect to information about the depiction of substances, the MPAA mentioned alcohol or drugs in its rating reason for 226 films (18%), while Screen It! identified depiction or use of tobacco, alcohol, and/or drugs in 1211 films (95%), including 26 of the 51 G-rated films (51%). We found significantly higher gross revenues for PG-13- and R-rated films when comparing films that received an MPAA rating reason for violence compared with those films that did not ($P < .001$ based on 2-sided t-tests with unequal variances for both of the separate tests of PG-13- and R-rated films).

Conclusions: Parents and physicians should be aware that movies with the same rating can differ significantly in the amount and types of potentially objectionable content. Age-based ratings alone do not provide good information about the depiction of violence, sex, profanity, and other content, and the criteria for rating movies became less stringent over the last decade. The MPAA rating reasons provide important information about content, but they do not identify all types of content found in films and they may particularly miss the depiction of substances.

Introduction

Concern about the content of movies dates back to the beginnings of the film industry and continues into the current time.^[1-6] Public health research demonstrates correlations between children's exposure to media and preventable mental health problems, and suggests that media may provide models for risky behaviors that children and adolescents may imitate.^[7,8] Researchers assessing the content of some popular PG-rated and non-animated G-rated movies noted the lack of appropriate public health messages (ie, a lack of injury prevention practices and poor portrayal of the consequences of injuries) and the presence of mixed and inappropriate health messages, including glorification of violent acts, smoking, alcohol and drug abuse, and frequent depiction of firearms.^[9,10] Our prior studies quantified the content in G-rated animated films and found that these films contained more depiction of violence, alcohol, and tobacco than might be expected given their G rating.^[11,12] With children consuming several hours of movies and videos weekly and representing a major part of the motion picture market,^[13,14] studying media content remains an important area for research.

We performed a review of the literature up through March 1, 2004 to identify any prior research that related motion picture ratings, content, and economic performance. We searched MEDLINE, EconLIT, ERIC, Academic Search Premier, and JSTOR for the terms "movie," "motion picture," or "box office" combined with "rating." In the JSTOR search, we searched for articles and reviews, selecting the following fields for journals: Art & Art History, Business, Economics, Finance, History, Mathematics, Political Science, Population Studies, Sociology, and Statistics. Our search of the literature did not reveal any academic studies that correlated all movie ratings with content or any recent studies that correlated ratings with film gross sales or budgets. Austin and colleagues^[15] reported that approximately 27%, 24%, and 14% of PG-, G-, and R-rated films, respectively, rated between 1968 and 1979 brought in revenues exceeding \$1 million (1969 dollars; note that this occurred before the separation of the PG-13 category), but did not relate the revenues to particular types of content. Reviews of the literature suggest inconsistent findings in individual studies related to whether media ratings significantly affect consumer interest, with a meta-analysis suggesting a potential age-related effect.^[16-19] Remarkably, no analysis to date comprehensively quantifies or characterizes the relationships between the ratings, content, and economics of movies; tests the hypothesis of decreased stringency in ratings over time (ie, "ratings creep"); or tests the hypothesis that animated and non-animated G-rated films contain similar depictions of violence on average. This study contributes quantitative information about these relationships and hypotheses.

Methods

This study compares the MPAA age-based ratings for films rated G, PG, PG-13, and R (excluding the very small number of NC-17 films) (<http://www.filmratings.com>),^[20,21] with information about content to determine the relative importance of potentially objectionable material in determining ratings and to examine the distribution of violence, sex, and profanity content across ratings. The MPAA provides voluntary age-based ratings and nonstandardized, descriptive rating reasons intended to inform consumers about the reason(s) a film received its age-based rating. The MPAA provides no specific criteria for its assignments of ratings or rating reasons; instead, it apparently leaves their assignment entirely to the judgment of its independent board of raters who view the films. While the rating reasons may not provide information about all of the types of content that parents might observe in films, they do provide information about some of the content and specifically about the content that the raters considered the most significant with respect to assigning the overall rating. By definition, the MPAA never assigns rating reasons to films rated G since the MPAA indicates that this rating implies suitability for all audiences.

We coded the MPAA's age-based ratings numerically as 1, 2, 3, and 4 for films rated G, PG, PG-13, and R, respectively (ie, we coded an R-rated film with the age-based rating of 4). Since the MPAA rating reasons do not follow any standard format, we coded each of the reasons with the classifications listed in [Table 1](#). The classifications include both the type of content (as a capital letter) and any modifying adjective for that content (as a lowercase letter). For example, we coded "violence" as "V," "action violence" as "aV," "strong violence" as "sV," and "sexual violence" as "zV." For some of our analyses, we further reduced the number of categories by combining content of similar natures; "violence" includes any rating reasons coded as Violence (V), Murder (M), Wrestling (W), Fighting (F), Rape (R), and Peril (K); "sex" includes any rating reasons coded as Sex (S), Sensuality (Q), Sexuality (J), Rape (R) (counted as violence and sex), Nudity (N); "substances" includes any rating reason coded as Drug (D), Alcohol (A), or Tobacco (T); and "thematic elements" includes any rating reason coded as Elements (E), Suicide (C), or Other (O). We also identified the animated films by searching their descriptions for indications of animation.^[21-24]

We relied on the content reviews produced by Kids-in-Mind^[22] and Screen It!^[23] for characterization of content-based scores. Kids-in-Mind represents an independent Internet consumer information service, not affiliated with any political or religious organization, which began providing information about films in 1992.^[22] Kids-in-Mind aims to provide impartial reviews of films theatrically released in the United States based on violence, sex, and profanity content, without making value judgments about appropriateness. The Kids-in-Mind trained reviewers use a scale from 0 to 10 for each category and assign a score based on quantity as well as intensity and the context of the potentially objectionable material (with 0 indicating no content of the type and 10 indicating the most extreme content). We summed the scores in the 3 categories to create a total Kids-in-Mind score, which ranges from 0 to 30, to capture the combined content because we recognized that movies might contain multiple types of content. We used all of the Kids-in-Mind data from 1992 to 2003 (n = 1906 movies) to explore the extent of ratings creep over time and to evaluate the amount of violence in G-rated animated films compared with non-animated films.

Screen It! similarly represents an independent Internet consumer information service also not affiliated with any political or religious organization that began providing information about film content in July 1, 1996.^[23] Screen It! provides information about movie content for 15 categories (ie, alcohol/drugs, blood/gore, disrespectful/bad attitude, frightening/tense scenes, guns/weapons, imitative behavior, jump scenes, music [scary/tense], music [inappropriate], profanity, sex/nudity, smoking, tense family scenes, topics to talk about, and violence) using 6 descriptions (ie, none, minor, mild, moderate, heavy, extreme). For computational ease, we assigned scores of 0, 1, 2, 3, 4, and 5 to the Screen It! descriptions "none," "minor," "mild," "moderate," "heavy," and "extreme," respectively. We also summed the scores of the Screen It! profanity, sex/nudity, and violence categories to create a total Screen It! score, which theoretically ranges from 0 to 15, comparable to the total Kids-in-Mind score.

We created a single database containing data from all 3 sources (ie, the MPAA, Kids-in-Mind, and Screen It!), which included films released between July 1, 1996 (ie, when Screen It! started providing information) and December 31, 2003. The MPAA rates hundreds of movies every year, and it rated over 5600 movies released during that time period. Neglecting the small number of films rated NC-17 not included in this study (ie, fewer than 20 during that time period), the distribution of films rated by the MPAA during this time includes 5%, 10%, 18%, and 67% of films rated G, PG, PG-13, and R, respectively. Over this time period, Kids-in-Mind and Screen It! assigned content-based ratings to 1346 (24%) and 1592 (28%) of these movies, respectively. We found a total of 1269 movies (23%) with information available from Kids-in-Mind, Screen It!, and the MPAA, with 4%, 13%, 36%, and 46% of these rated G, PG, PG-13, and R, respectively. Compared with the overall distribution of films, Kids-in-Mind and Screen It! rated a significantly lower proportion of R-rated films and higher proportion of PG-13-rated films, which may reflect their intentions to provide information about films more likely to be widely released in theaters, potentially viewed by children and young adults, and of interest to parents. We used this database to compare the content scores from the independent sources with each other and to quantify the correlation between content scores and ratings. We used the information from Screen It! about substances (tobacco and alcohol/drugs) to characterize the amount of information provided by the MPAA rating reasons about substances in films. Although the content-based ratings from Kids-in-Mind and Screen It! represent subjective judgments and no available data exist to inform judgments on interrater reliability of the reviewers, these resources provide the most comprehensive, independent databases of quantitative reviews of film content.

Finally, for these 1269 films with complete data from the MPAA, Kids-in-Mind, and Screen It!, we obtained the available data on each film's cumulative US gross box office sales and reported budgets from the IMDbPro database.^[24] We matched films by title and release year and included the gross sales and budgets in US dollars when available. We note that the IMDbPro database does not adjust its economic data for inflation or provide a source for reported budget data. While we believe that these data include inherent uncertainties, we believe that they represent the best publicly available data about the economics of films, and we use them to explore correlations between movie ratings, content, and economics to generate hypotheses for future studies.

We used Microsoft Access (Microsoft Corp, Redmond, Washington) to construct the database, and we performed the descriptive and statistical analyses using Microsoft Excel (Microsoft Corp, Redmond, Washington) and SAS (Version 8.2 for Windows, SAS Institute Inc., Cary, North Carolina).

Results

Testing the Hypothesis That Criteria for Ratings Became Less Stringent Over Time

We explored the hypothesis of ratings creep using the full set of Kids-in-Mind data (n = 1906). [Table 2](#) shows the total number, the distribution of the films assessed by Kids-in-Mind by rating, and the average total Kids-in-Mind score for that year. These data indicate that Kids-in-Mind assessed a relatively similar sample of movies each year with respect to the overall proportion of ratings; however, some variation exists. We corrected for the potential impact from this variation in the

average total Kids-in-Mind scores by using the rating-weighted average total Kids-in-Mind score for each year. (We computed these by applying the average percentages over all of the years, shown in the last row of the table, as the consistent percentage of films within each age-based category for each year and averaging the total Kids-in-Mind score for each year based on these).

Figure 1 shows the data and the best fit line for the rating-weighted average total Kids-in-Mind scores over time. This line clearly shows a significant upward slope, indicating that the Kids-in-Mind raters assigned higher scores in later years. While this could indicate increased sensitivity by the Kids-in-Mind raters over time, their rating method and content-based scores appear relatively stable (ie, a film that received a score of 3 in 1992 seems likely to receive the same score if issued in 2002). Consequently, we believe that ratings creep represents the more likely explanation for the increase and that the MPAA appears to tolerate increasingly more extreme content in any given age-based rating category over time, a suggestion that Kids-in-Mind makes as well based on experience with reviewing films.^[22] We further explored the contributions to these trends by content type, and we find significant ($P < .01$) increases over this time period in violence in PG- and PG-13-rated films (but not for G- and R-rated films), significant increases in sex in PG-, PG-13-, and R-rated films (but not for G-rated films), and significant increases in profanity in PG-13- and R-rated films (but not for G- or PG-rated films). We emphasize that this 10-year period does not represent the full time scale of films, and that our prior study did show a significant increase in violence over the entire history of G-rated animated films.^[11] However, the last 10 years represents the most recent past, which parents may find the most relevant. These data suggest that the MPAA applied increasingly more lenient criteria for its age-based ratings as a function of time over the last decade. We suggest that these results provide hypotheses that future content analyses might address through independent coding of content of random samples of films.

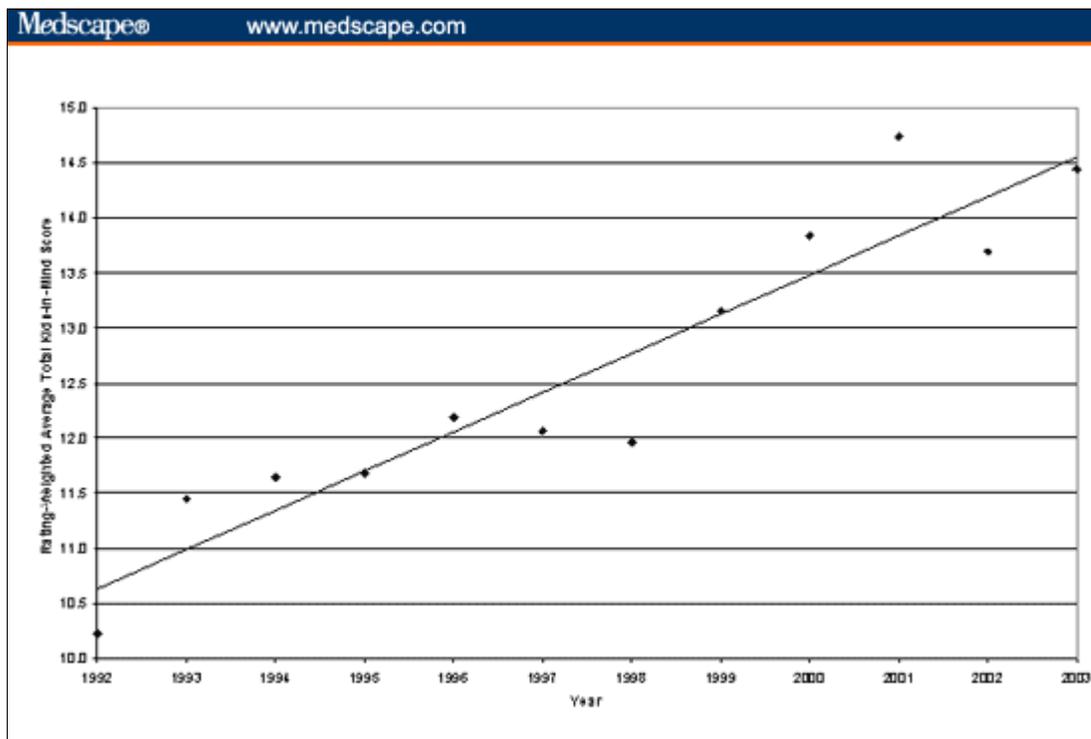


Figure 1. Rating-weighted average total Kids-in-Mind scores over time and best-fit line.

Testing the Hypothesis of More Violent Animated Than Non-animated G-rated Films

Using data from all 79 of the Kids-in-Mind scores for G-rated films reviewed since 1992, which include 50 animated films and 29 non-animated films, we found that animated films received a significantly higher content-based score for violence than non-animated films ($P < .005$ based on a Wilcoxon rank sum test). Limiting the data to the films released since mid-1996, we still find significant results testing the violence scores from both Kids-in-Mind and Screen It! for G-rated animated vs non-animated films using Wilcoxon rank sum tests ($n = 51, P < .05$). These results suggest that, on average, G-rated animated films depict significantly more violence than non-animated G-rated films.

Correlation of Content and Age-Based Ratings

We found good correlation between the Kids-in-Mind and Screen It! content-based total scores ($R^2=0.83, P < .01$). Figure 2

shows the proportion of films within each age-based category that received different content-based scores for sex/nudity as assigned by Kids-in-Mind, and Figures 3 and 4 show comparable information for violence and profanity content-based scores, respectively. The hashed portions indicate the films for which the MPAA indicated related content as a reason for the film's rating. These figures show variability in the content-based scores, and [Table 3](#) summarizes the ranges of scores assigned for each type of content and for the total by rating for both Kids-in-Mind and Screen It! We note that given our finding of significant ratings creep above, the reduced stringency in criteria used by the MPAA over time may account for some of the variation observed in Figures 2, 3, and 4 (ie, if the MPAA assigned a relatively lower age-based rating in recent years than it did previously, then some films with relatively higher content-based scores appear in lower age-based rating categories). These figures demonstrate that films assigned any particular rating may not contain significant amounts of all types of content (eg, some R-rated films received content scores of 0 for one type of content.) We found at least one film in each rating category that received a total Kids-in-Mind score of 7 (eg, *Babe: Pig in the City* (G), *Star Wars Episode 1: The Phantom Menace* (PG), *Patch Adams* (PG-13), and *Besieged* (R)).

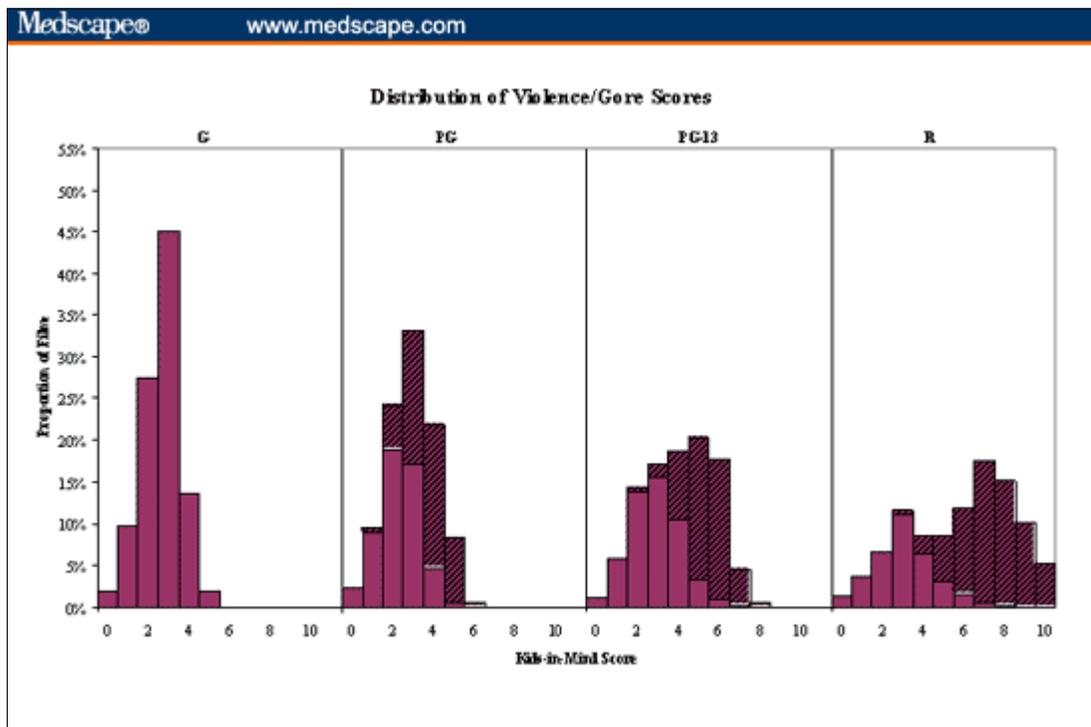


Figure 2. Distribution of Kids-in-Mind content-based scores by rating for violence.

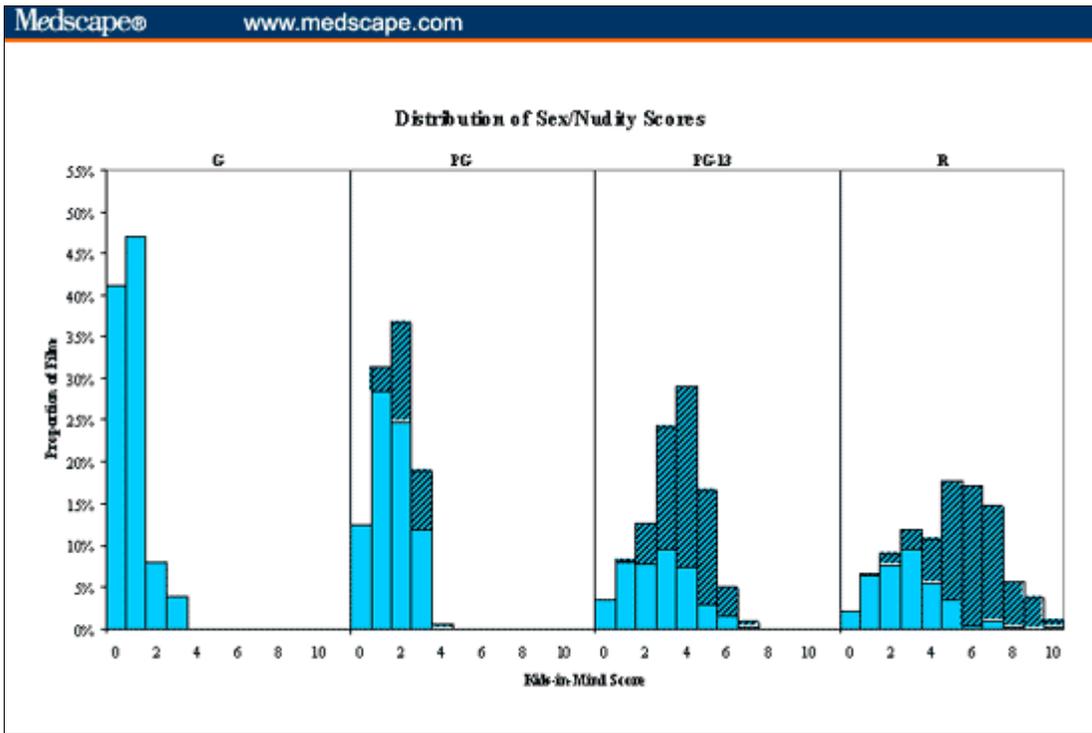


Figure 3. Distribution of Kids-in-Mind content-based scores by rating for sex/nudity.

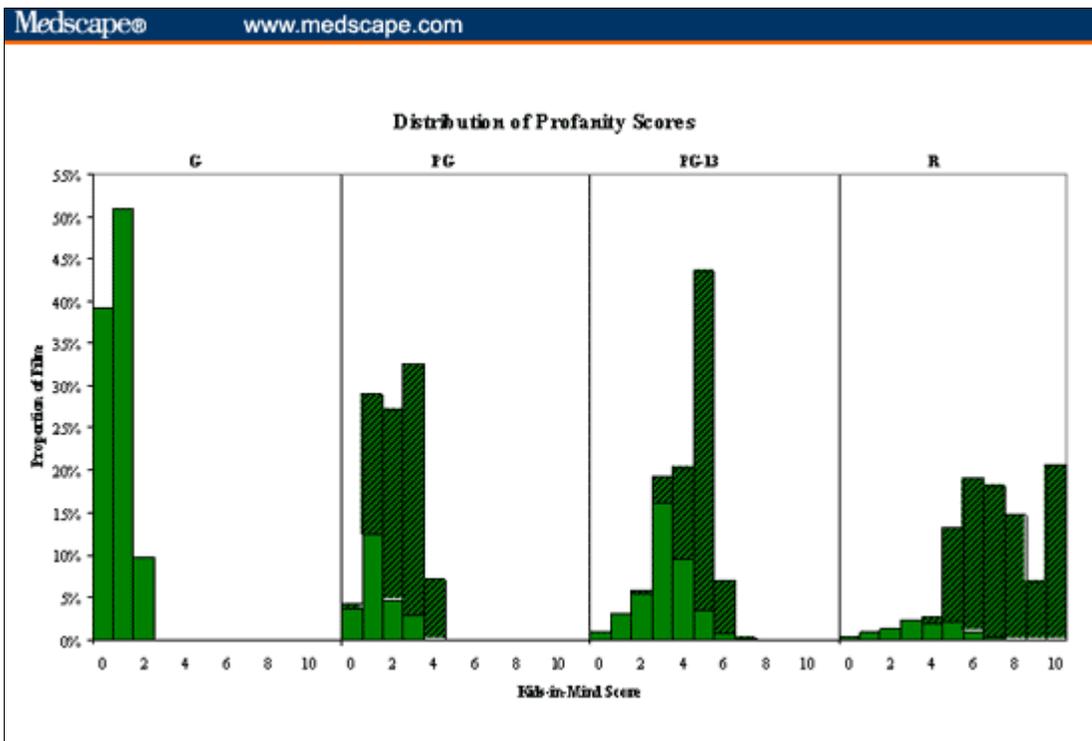


Figure 4. Distribution of Kids-in-Mind content-based scores by rating for profanity.

Table 4 reports the average content scores for violence, sex, and profanity for both Kids-in-Mind and Screen It! data as a function of the MPAA rating. This table shows that films consistently receive higher scores for violence than for sex, and that profanity dominates for R-rated films.

Table 5 shows the distribution of the maximum Kids-in-Mind scores (ie, the highest score received in any of the 3 categories)

by rating and overall. The results suggest wide variability, but show that films that receive higher maximum scores generally receive higher ratings. This table demonstrates that no films that received a maximum Kids-in-Mind score of lower than 4 received an R rating. For 282 of the 1269 films (22%), we found that the maximum Kids-in-Mind score for any single type of content occurred for more than one type of content (eg, a maximum score of "6" occurred in both the violence and profanity categories or in all 3 content categories) as shown in [Table 6](#). This suggests that while a single type of content may drive the ratings of some films, sufficient evidence exists of multiple types of content driving the ratings in a significant proportion of films such that studies of content need to explore combined measures of content (eg, the total scores used here).

Correlation of Content and Rating Reasons

Based on the data shown in Figures 2, 3, and 4, the MPAA appears to assign rating reasons to content that receives relatively higher content-based scores (note that comparable figures for Screen It! provide similar results, not shown). However, some films that scored lower than others received a rating reason from the MPAA while some higher-scoring films did not. For the 1269 films we analyzed, we found that the MPAA assigned between 0 (for G-rated films) and 6 rating reasons for any single film. The number of reasons indicated for the MPAA rating significantly increases with the age-based rating category, with an average of 2, 2.4, and 2.7 rating reasons for films rated PG, PG-13, and R, respectively.

Using our standardized codes described in [Table 1](#), we needed a total of 678 unique codes to describe the more than 3000 total rating reasons that the MPAA assigned to the 1218 films rated PG and higher. We found that of the 1218 films that received rating reasons, 689 received them for sex/nudity (57%), 692 for violence (57%), and 940 for language (77%). [Table 7](#) provides the breakdown of codes for violence along with the average of the associated Kids-in-Mind scores for violence included in parentheses. We found that the MPAA assigned the modifier for "graphic" only to R-rated films (films that Kids-in-Mind also scored as a "7" or higher for violence), and the MPAA generally assigns "aV" (for "action violence") only to PG- and PG-13-rated films (except for 2 R-rated films that also received the "s" modifier for "strong action violence" or "non-stop action violence"). [Table 8](#) provides the breakdown of the codes assigned by rating for codes related to sex/nudity with the average of the associated Kids-in-Mind scores for sex/nudity included in parentheses. Looking at these data, we find that rating reasons of "sexuality" and "nudity" (ie, codes J and N) generally lead to higher age-based ratings (R or PG-13) than "sensuality," "sex," and "innuendo" (ie, codes Q, S, and B). [Table 9](#) provides the breakdown of the codes assigned by rating for codes related to language with the average of the associated Kids-in-Mind scores for profanity included in parentheses. We found that the MPAA only gave the "mild language" rating reason for PG-rated films, and gave "strong language" rating reasons only to films rated PG-13 and R. The results clearly show increasingly higher average scores for language for films with higher age-based ratings.

Characterization of the Depiction of Substances in Films

The MPAA mentioned alcohol or drugs in its rating reason for 226 films (18%), while Screen It! assigned a score above "none" for tobacco and/or alcohol/drugs for 1211 films (95%) and above "none" for alcohol/drugs for 1180 films (93%). This includes Screen It! finding substances depicted in 26 of the 51 G-rated films (51%), a comparable finding to our earlier result of 47% of all G-rated animated films.^[12] Although we recognize differences between films that include a minor depiction of a substance in the background, films in which only bad characters use substances, and films in which good and bad characters heavily use substances, anyone seeking information about any substance depiction or use in films clearly currently cannot rely on the rating reasons alone for this information.

We noted that the MPAA provided rating reasons for teen alcohol and/or drug use for 15 of the 1269 films, including PG-rated: *October Sky* ("brief teen ... alcohol use"), *Race the Sun* ("brief incident of teen drinking"); PG-13-rated: *Crossroads* ("brief teen drinking"), *Blue Crush* ("teen partying"), *Can't Hardly Wait* ("teen drinking"), *Get Over It* ("teen drinking"), *She's All That* ("teen drinking"), *Teaching Mrs. Tingle* ("some teen drinking"), *To Gillian on Her 37th Birthday* ("teen drinking"), *10 Things I Hate About You* ("alcohol and drug-related scenes, all involving teens"), *Drive Me Crazy* ("teen alcohol and drug use"); and R-rated: *American Pie* ("drinking, all involving teens"), *Thirteen* ("drug use... involving young teens"), *Idle Hands* ("pervasive teen drug use"), *Outside Providence* ("pervasive teen drug use"). We also noted that Screen It! gave 2 R-rated films an "extreme" rating for the category of alcohol/drugs for which the MPAA did not indicate alcohol or drugs as a rating reason (*Heaven's Gate* and *The Life of David Gale*). Screen It! also gave a "heavy" rating for the category of alcohol/drugs for 3 PG-rated films for which the MPAA did not indicate alcohol or drugs as a rating reason (*My Big Fat Greek Wedding*, *First Wives Club*, and *Kangaroo Jack*). Most films that depict alcohol/drugs also depict tobacco, with only 31 films (2%) receiving a score above "none" for alcohol/drugs receiving a score of "none" for tobacco.

With respect to smoking, Screen It! assigned a score above "none" for 1007 films (79%). The MPAA did not indicate smoking as a rating reason for any of the 1269 films (0%). However, we noted that in 2003 the MPAA listed teen smoking as a rating reason for 3 films rated PG-13 (*The Incredible Mrs. Ritchie*, *The Outsiders*, and *Saved!*), although Kids-in-Mind and Screen It! did not review any of these films, so they do not appear in the 1269 included in our analysis.

Correlation of Ratings and Content With Financial Information

Based on analysis of the averages of gross revenues as a function of content indicated by the MPAA in a rating reason, we found that the highest average gross revenues for PG-, PG-13-, and R-rated movies occurred for those movies that only received an MPAA rating reason for violence. We found significantly higher gross revenues for PG-13- and R-rated films when comparing films that received an MPAA rating reason for violence compared with those films that did not based on a 2-sided t-test with unequal variances ($P < .001$ for both of the separate tests of PG-13- and R-rated films). Looking at a proxy for net profit (ie, gross revenues minus budget, while noting concerns about reporting of financial data^[16]), we similarly found that films rated PG and PG-13 that received MPAA rating reasons only for violence reported higher values on average than films with other combinations of rating reasons. However, for this metric we noted that R-rated films that received MPAA rating reasons for sex and language only generated higher values on average than films with other combinations of rating reasons. More exploration of these types of correlations could further illuminate any relationships that exist between film content and economics, and these findings suggest hypotheses for further analysis and testing. Most importantly, these data provide some evidence of a correlation between violence and ticket sales, at least in the United States.

Discussion

Our analyses suggest that age-based and content-based rating information provide important insights about films and show strong correlations between higher scores for different types of content and higher age-based ratings. This study provides the first comparison between content-based ratings and the MPAA's age-based ratings and rating reasons, and it provides important information for parents and physicians about the content and ratings of films. Studies on children's use of various media suggest that videocassette viewing is an important source of entertainment for children, and these results suggest that parents should pay attention to the content in the films. We believe that physicians must actively engage parents in discussions about messages in the media and encourage them to engage in discussions with their children about media content.

Our findings related to creep of the ratings over the last decade suggest the need for consideration of efforts to standardize rating criteria over time, and perhaps logically relating any standards to children's development as appropriate, although we note that this may also change with time. The existence of ratings creep represents an important concern for parents and physicians, since their expectations for content in films of a given rating may reflect the experience from earlier points in time.

For G-rated films, our finding that animated films received significantly higher scores for violence than non-animated films suggests the need for additional research on the effects of animation on perception, particularly for young children. Given the possibility of long-term fear and anxieties from children's exposure to media,^[25] physicians should discuss media consumption with parents of young children and the fact that animation does not guarantee appropriate content for children. Researchers should make it a priority to explore the cognitive effects of films on children of different levels of development and to expand on the limited research that now exists about children's ability to distinguish reality from fantasy,^[26,27] while recognizing that understanding that something is not real does not necessarily negate effects.^[28,29] In addition, researchers should also focus on identifying the other social factors that affect child development^[30] and on characterizing the degree to which viewing films changes children's behavior, attitudes, and beliefs. Other studies raise the same issues with respect to video games.^[31]

While comparing different types of content and the meanings of the content scores relative to each other represents a difficult task, our findings in [Table 4](#) provide some additional evidence to that suggested by prior studies^[32,33] that the MPAA may assign more restrictive ratings to films containing sex than those containing violence. We reiterate, however, that the average scores that Kids-in-Mind assigned for sexual content for films rated PG, PG-13, and R probably increased significantly over the last decade, which contributed to the significant observed increase in overall ratings creep, and this suggests that the relative restrictiveness may continue to change. Given the absence of objective criteria applied to rate movies and assign rating reasons combined with increasing technological sophistication, we should probably expect ratings creep to continue.

The MPAA rating reasons generally correlate with higher scores assigned to content-based ratings (Figures 2, 3, and 4), which suggests good agreement between the rating reasons and related content-based scores. We found that the number of rating reasons given increases with rating category, as does the total score. However, by design, the rating reasons do not provide information about all types of content that might appear in films that might be of interest to parents. Notably, with Screen It! identifying tobacco in 1007 (79%) of the films and the MPAA providing no information about cigarettes in films, our findings clearly suggest the need for increased parental awareness about the prevalence of tobacco depiction in films, a point raised by other studies as well.^[12,34] Combined with the significant amount of depiction of alcohol and drugs, we believe that the MPAA should consider whether raters should provide information about all substances in films as part of or in

addition to film rating reasons. Our observation that the MPAA noted teen smoking as a rating reason for 3 PG-13 films in 2003 provides some indication of the MPAA's sensitivity to the issue with respect to films depicting the behavior of teens smoking, a situation where the US law prohibits those under the age of 18 years from purchasing tobacco. We emphasize that efforts to address the glamorization and normalization of substances in media marketed to youth clearly deserve significant attention.^[35]

This paper provides the first attempt to correlate content, ratings, and the economics of films. We suggest that future studies should further explore the multitude of factors that influence film success and help characterize the role of particular types of content associated with better box office performances and/or lower costs of production. We note that the cost data should include adjustments for inflation, and that researchers should recognize that the data available from IMDbPro do not factor in time in their box office and budget data. Simple adjustment of the data by year in this study did not change the results (ie, with the appropriate adjustment of dollar values up to 2003 dollars for the years between 1996 and 2002, which required multiplying a factor between 1.17 and 1.02). The uncertain quality of the budget information leaves us to suggest that the MPAA remains in the best position to perform these types of analyses since movie studios pay a fee to obtain the MPAA rating that depends on the movie's budget, and the MPAA thus maintains the best access to these data.^[36] However, given that the industry and the media rely on the IMDbPro data when reporting movie financial information, we believe these data provide sufficiently high quality for generating hypotheses for further exploration. Notably, future researchers should test the hypothesis that films that only receive a rating reason for violence obtain higher box office gross revenues on average, and the potential relationship between R-rated films that only receive a rating reason for sex and language performing best on the metric of gross revenues minus budget. We believe that the lack of better data to examine these correlations significantly limits the ability of independent researchers to assess whether particular types of content significantly correlate with budgets or box office returns. However, based on these limited data, it does appear that media violence sells in the United States.

The history of the evolution of the rating system suggests important context with respect to the information it provides, its purpose, and its future. The first motion pictures appeared in theaters in 1895, beginning in vaudeville, and the new technology quickly grew in popularity^[37]; in a 1915 decision, the US Supreme Court upheld the right of states to restrict movie content in *Mutual Film Corporation v. Industrial Commission of Ohio*, 236 U.S. 230. In 1922, with 34 state laws restricting movie content, William Hays formed the Motion Picture Producers and Distributors of America to create a mechanism for industry self-regulation, the predecessor to today's MPAA. In the 1930's, sociologists critically studied movies and noted their influences on individuals. By 1934, the industry became bound by a Production Code that required (1) cutting sex, revenge killing, arson, and dynamiting from films and (2) films receive a seal of approval prior to release.^[38] In the 1960s, the MPAA led efforts to abolish the Production Code, which it perceived at the time as socially outdated in a time of sexual revolution. However, given 2 Supreme Court decisions in 1968 that maintained the power of cities and states to prevent children's exposure to books and films that could not be denied to adults (*Ginsberg v. New York*, 390 U.S. 629 and *Interstate Circuit v. Dallas*, 390 U.S. 676), the industry recognized that it would need some means for providing parents with advance cautionary warnings about film content.^[16,20] Thus, in November 1968, the MPAA initiated its voluntary movie rating system based on trademarked ratings that it continues to use with relatively few changes since then.

Despite the MPAA's efforts and general satisfaction reported on its parent surveys,^[20] some parents indicate a strong preference for information about the content of movies instead of an age-based rating^[39,40] like that provided by the MPAA, and Internet sites like Kids-in-Mind and Screen It! help to meet this need.^[22,23] Although numerous studies recommend criteria for improving media rating systems to include more descriptive information about content,^[17,19] suggest the need to consider development of a universal media rating system,^[17,30,33] raise questions about the extent to which existing ratings systems provide complete information about content for parents,^[33,41] and indicate the need for ratings that factor in child development,^[42] to date the industry has not engaged in any efforts to develop a rigorous science-based, child-development conscious, and parent-friendly universal media rating system. The lack of such an effort given public opinion polls reporting between 40% of parents indicating that a single rating system for all media would be "more useful"^[43] and 78% of parents indicating that a uniform rating system for all media would be "better"^[44] indicates an important disconnect between parent preferences and those of the ratings boards. We believe that given cross-media marketing and the proliferation and interaction of media, the research community should play a key role in exploring the potential development of a universal media rating system.

We recognize many limitations of this study, and we believe that future studies should use these results as a basis for developing and testing hypotheses. As indicated above, we relied on economic information of uncertain quality, and while they represent the best publicly available data relied on by the industry and the media, other studies should validate our observations. We also note that in constructing our database, we selected those films that both Kids-in-Mind and Screen It! reviewed, and this introduced a selection bias toward movies that they both identified as films important to them to review. Neither resource provides extensive information about the criteria used to select the movies that they review, but we believe that they effectively choose movies that studios market toward young audiences and release widely in theaters since their stated missions focus on providing high-quality, comprehensive information to help empower parents make better choices about films for their kids.^[22,23] In addition, some variability may exist in the content-based scores, with Kids-in-Mind noting that "like most numerical rating systems, the numbers are inherently approximations (think of them as plus-or-minus-

one)."^[22] However, since both Kids-in-Mind and Screen It! provide detailed information and context to support their assessments, we believe that their scores represent reasonably consistent assessments and that they've remained stable over time. Although our use of the total scores to assess combined content implicitly assumes equal importance of the 3 types of content, we note that the existence of the individual scores makes it possible for parents particularly concerned about specific types of content to place more weight on those (eg, parents concerned more about violence or sex than profanity might deem a movie rated R for language more appropriate for their children than a PG-13 movie that received rating reasons for violent and sexual content^[22]). With respect to substances, parents concerned about the messages that their children get from media should seek information about the depiction of substances in films from resources besides the MPAA, recognizing that the MPAA currently fails to provide reliable information about substances in films.

Conclusion

Physicians must recognize their critical role in emphasizing the reality that rating reasons do indicate some important film content, but they do not provide complete information about film content. Parents must recognize their responsibility in choosing appropriate films with and for their children, and in discussing the messages in films with children to mediate any potential adverse effects and reinforce any potential beneficial effects. Efforts to create an improved universal media rating system should build on these findings and develop standardized criteria so that parents understand what the ratings mean in terms of specific content in the films.

Tables

Table 1. Classifications and Codes Used for Describing Content of MPAA Rating Reasons

Rating Reason Categories
A = alcohol/drinking/partying
B = reference/image/symbolism/innuendo
C = suicide
D = drugs/drug use/drug references/drug-related/drug addiction/substance abuse
E = thematic elements/themes/subject matter/plot elements/mature themes/emotional intensity
F = fight/fighting/beating/wrestling/bullying/kickboxing
H = humor
I = illegal/criminal/mischief/pranks
J = sexuality/eroticism/erotic content
K = peril/threat/threatening situation/danger/suspenseful situations/stunts/frightening moments/scary moments
L = language/dialogue
M = murder/execution/massacre/hanging
N = nudity/exotic dance/erotic dance
O = other
Q = sensuality
R = rape/sexual assault
S = sex/sexual content/sex scenes/sex-related situations/depictions of sexual fantasy/sexual material
T = tobacco/smoking
U = unintended injury/accident/natural disaster/unavoidable event
V = violence/stylized action/action/menacing action/combat/battles/carnage/violent images/violent scenes/shootings/stabbings/animal action/destruction
W = gore
Modifiers
a = action (Example: aV = action violence)
b = bloody
c = death-related/morbid/macabre/dark (Example: gcV = gory death scene)
d = disturbing/chilling/frightening/shocking/scary/horror
f = aberrant/bizarre/perverse/unsuitable/psychopathic
g = graphic/explicit/grisly/grotesque
h = humorous/comic/parody/slapstick/farcical
k = kid/teen (Example: kA = teen or underage alcohol)
m = mild/partial/rear nudity
o = other (type of content noted) (Example: V,O(abuse) = domestic violence)
q = brief/quick
r = racial (Example: rL = racial dialogue)
s = strong/pervasive/gruesome/terror/mature/torture/cruelty/intense/diverse/brutal/terrorist/plentiful/masochistic/nonstop/abundance/realistic/gritty/gang/mob/street and ring/frequent/continuous/non-stop/traumatic/vicious/extensive/harsh/sinister/intense/extremely
u = sensual
v = vulgar/crude/rude/risque/off-color/bathroom/coarse/gross/double entendre/bawdy
x = suggestive/racy
z = sexual/sex-related

Table 2. Number of Films Assessed By Kids-in-Mind, Distribution by Rating, and Unadjusted Average of the Total Kids-in-Mind Scores By Year

Year	Number	G	PG	PG-13	R	Average Total Kids-in-Mind
1992	101	4%	18%	26%	52%	10.5
1993	157	4%	25%	31%	39%	10.6
1994	157	4%	29%	28%	39%	10.6
1995	147	5%	19%	29%	48%	11.7
1996	147	4%	20%	31%	46%	12.0
1997	145	2%	21%	31%	46%	12.0
1998	182	4%	13%	28%	55%	12.6
1999	192	6%	8%	30%	56%	14.0
2000	148	5%	11%	44%	41%	13.8
2001	161	3%	10%	40%	47%	15.2
2002	185	5%	13%	41%	41%	13.5
2003	184	3%	12%	44%	41%	14.4
Total	1906	4%	16%	34%	46%	12.6

Table 3. Summary of Ranges for Content-Based Scores by Rating

	Possible Range	Observed Range By Rating			
		G	PG	PG-13	R
Kids-in-Mind					
Violence	0-10	0-5	0-6	0-8	0-10
Sex	0-10	0-3	0-4	0-7	0-10
Profanity	0-10	0-2	0-4	0-7	0-10
Total	0-30	1-8	2-12	5-18	7-29
Screen It!					
Violence	0-5	0-4	0-5	0-5	0-5
Sex	0-5	0-3	0-3	0-5	0-5
Profanity	0-5	0-2	0-3	0-4	0-5
Total	0-15	0-7	2-9	3-13	4-15

Table 4. Average Kids-in-Mind Score and Screen It! Score for Violence, Sex, and Profanity by Rating and Overall (Possible Ranges Shown in Table 3)

Rating	G	PG	PG-13	R	All
Kids-in-Mind					
Violence	2.6	2.9	4.0	5.9	4.7
Sex	0.7	1.6	3.4	4.9	3.7
Profanity	0.7	2.1	4.1	7.1	5.1
Total	4.1	6.6	11.6	17.8	13.5
Screen It!					
Violence	2.3	2.4	3.2	3.9	3.3
Sex	0.5	1.4	2.9	3.5	2.9
Profanity	0.2	1.4	2.9	4.5	3.3
Total	3.0	5.2	9.0	11.9	9.6

Table 5. Summary of Maximum Kids-in-Mind Scores (Highest Score Received in any of the 3 Categories) for Films by Rating and Overall

Max Kids-in-Mind score	G	PG	PG-13	R	All
1	5	5			10
2	15	30	1		46
3	23	74	24		121
4	7	45	65	2	119
5	1	14	221	16	252
6		1	123	74	198
7			26	127	153
8			2	130	132
9				94	94
10				144	144
Total	51	169	462	587	1,269

Table 6. Counts of Films with Tied Maximum Kids-in-Mind Scores for Films by Rating and Overall

Max Kids-in-Mind score	G	PG	PG-13	R	All
1	1	5			6
2	2	18	1		21
3	1	23	16		40
4		3	25	2	30
5			68	7	75
6			11	26	37
7				31	31
8				22	22
9				7	7
10				13	13
Total	4	49	121	108	282

Table 7. Summary of Classifications and Codes for Violent Content Assigned by the MPAA by Rating and Overall (With Average of Associated Kids-in-Mind Scores for Violence)

Rating Reason		Rating (Mean Kids-in-Mind Score)				
Code	Example	G	PG	PG-13	R	All
None		51 (2.6)	88 (2.3)	237 (2.8)	201 (3.1)	557 (2.8)
V	Violence		23 (3.8)	111 (5.1)	184 (6.5)	318 (5.8)
sV	Strong violence		2 (2.0)	25 (6.0)	94 (7.8)	121 (7.4)
aV	Action violence		15 (4.3)	32 (5.4)		47 (5.1)
sV,sW	Strong violence and gore			2 (6.0)	26 (9.2)	28 (9.0)
saV	Strong action violence		2 (4.0)	16 (5.9)	2 (7.5)	20 (5.9)
qV	Brief violence		2 (3.5)	9 (3.8)	9 (5.2)	20 (4.4)
V,W	Violence and gore			1 (6.0)	12 (8.4)	13 (8.2)
ssV	Strong pervasive violence				13 (8.1)	13 (8.1)
K	Peril		7 (3.6)	4 (5.0)		11 (4.1)
sgV	Strong graphic violence				11 (8.6)	11 (8.6)
mV	Mild violence		10 (2.8)			10 (2.8)
V,K	Violence/peril		4 (3.8)	4 (5.8)		8 (4.8)
gV	Graphic violence				7 (8.0)	7 (8.0)
hV	Comic violence		4 (3.8)	1 (6.0)		5 (4.2)
F	Fighting		3 (2.7)	2 (4.5)		5 (3.4)
dV	Disturbing violent content		1 (5)	2 (4.5)	2 (9.5)	5 (6.6)
sbV	Strong bloody violence				4 (8.8)	4 (8.8)
mK	Mild peril		3 (3.0)			3 (3.0)
V,dB	Violence, disturbing images			3 (6.0)		3 (6.0)
kV	Violence involving teens			1 (6)	2 (4.0)	3 (4.7)
sgV,sgW	Strong graphic violence and gore				3 (8.3)	3 (8.3)
aV,K	Action violence/peril		1 (3)	1 (5)		2 (4.0)
V,F	Wrestling violence			2 (6.0)		2 (6.0)
sV,dB	Strong violence, disturbing images			2 (5.5)		2 (5.5)
sK	Intense life/death situations			1 (7)	1 (7)	2 (7.0)
bV	Bloody violence			1 (4)	1 (9)	2 (6.5)
ssV,ssW	Strong pervasive violence/gore				2 (8.5)	2 (8.5)
Others			Note A	Note B	Note C	
	Grand Total	51 (2.6)	169 (2.9)	462 (4.0)	587 (5.9)	1269 (4.7)

Note A: Four PG-rated films received unique codes (with the associated Kids-in-Mind score for sex/nudity in parentheses): qmV(2); mF(2); qmK(3); and mhaV(4).

Note B: Five PG-13-rated films received unique codes: haV(5); sV,F(5); aV,dB(6); K,W(6); and sB(6).

Note C: Fourteen R-rated films received unique codes: dV,R(6); R,M(6); qsV(6); qgV(7); sgV,W(8); gzV,sR(8); gbV(8); V,sR(8); sgV,R(9); ssV,ssW,sB(10); gV,W(10); sdV(10); gsV,R(10); and fv(10).

Table 8. Summary of Classifications and Codes for Sex/Nudity Content Assigned by the MPAA by Rating and Overall (With Average of Associated Kids-in-Mind Scores for Sex/Nudity)

Rating Reason		Rating (Mean Kids-in-Mind Score)				
Code	Example	G	PG	PG-13	R	All
None		51 (0.7)	131 (1.5)	186 (2.6)	212 (2.8)	580 (2.3)
J	Sexuality		1 (3)	27 (4.1)	149 (6.0)	177 (5.7)
S	Sexual content		1 (3)	108 (4.3)	53 (5.6)	162 (4.7)
Q	Sensuality		16 (2.3)	55 (3.5)		71 (3.2)
N	Nudity		1 (4)	9 (4.3)	30 (5.3)	40 (5.1)
zB	Sexual innuendo		1 (1)	23 (3.5)	7 (4.4)	31 (3.6)
sJ	Strong sexuality			2 (4.5)	24 (7.2)	26 (7.0)
J,N	Sexuality and nudity			4 (4.8)	21 (6.7)	25 (6.4)
qN	Brief nudity		2 (2.5)	3 (3.3)	18 (4.9)	23 (4.5)
qJ	Brief sexuality			8 (3.1)	14 (4.4)	22 (3.9)
sS	Strong sexual content				23 (7.6)	23 (7.6)
mQ	Mild sensuality		6 (2.2)	2 (3.5)		8 (2.5)
B	Innuendo		4 (1.5)	4 (2.5)		8 (2.0)
S,N	Sex and nudity			3 (5.0)	3 (7.0)	6 (6.0)
sS,N	Strong sex and nudity				6 (8.2)	6 (8.2)
Q,N	Sensuality and nudity			5 (4.6)		5 (4.6)
sJ,N	Strong sexuality and nudity				5 (8.4)	4 (8.4)
mN	Partial nudity			3 (4.0)		3 (4.0)
qzB	Brief sexual references			1 (4)	2 (6.0)	3 (5.3)
kJ	Teen sexuality			1 (3)	2 (6.0)	3 (5.0)
R	Rape				3 (2.7)	2 (2.7)
qmN	Brief partial nudity		1 (2)	1 (2)		2 (2)
S,mN	Sexual content, partial nudity			2 (4.5)		2 (4.5)
vS	Crude sexual content			2 (4.5)		2 (4.5)
qQ	Brief sensuality			2 (3.5)		2 (3.5)
qJ,N	Brief sexuality/nudity				2 (5.0)	2 (5.0)
Others			Note A	Note B	Note C	
	Grand Total	51 (0.7)	169 (1.6)	462 (3.4)	587 (4.9)	1269 (3.7)

Note A: Five PG-rated films that received unique codes (with the associated Kids-in-Mind score for sex/nudity in parentheses): qkQ(1); mzB(2); Q,mN(3); hQ(3); and hN(3).
 Note B: Eleven PG-13-rated films that received unique codes: J,zB(3); hJ(3); J,qN(4); zB,mN(4); N,B (4); N,Q (5); Q,B(5); Q,B,N(5); qQ,N(5); S,qN(5); and J,B(5).
 Note C: Thirteen R-rated films that received unique codes: qN,J(2); shS(5); qsJ(5); qS(5); fzB,N(6); sN(6); skS (7); sR,sJ,N(7); vS,N(8); svS(8); sR,fJ,N(8); skJ (9); and sR,J(9).

Table 9. Summary of Classifications and Codes for Language Content Assigned by the MPA by Rating and Overall (With Average of Associated Kids-in-Mind Scores for Profanity)

Rating Reason		Rating (Mean Kids-in-Mind Score)				
Code	Example	G	PG	PG-13	R	All
L	Language		62 (2.6)	200 (4.8)	411 (7.2)	673 (6.1)
None		51 (0.7)	40 (1.3)	179 (3.1)	59 (3.6)	329 (2.6)
sL	Strong language			12 (5.0)	73 (9.0)	85 (8.4)
mL	Mild language		47 (2.3)			47 (2.3)
qL	Brief language		10 (1.4)	25 (4.9)	6 (5.2)	41 (4.1)
qsL	Brief strong language			29 (5.0)	1 (5)	30 (5.0)
zL	Sex-related dialogue			6 (4.5)	7 (7)	13 (5.8)
ssL	Strong pervasive language				12 (9.3)	12 (9.3)
qmL	Brief mild language		10 (1.7)			10 (1.7)
szL	Strong sexual dialogue				9 (8.4)	9 (8.4)
vL	Crude language			8 (4.3)	1 (6)	9 (4.4)
kvzL	Crude sexual dialogue, involving teens			1 (4)	1 (8)	2 (6.0)
gzL	Graphic sex-related dialogue				2 (10.0)	2 (10.0)
kL	Language, involving teens				2 (8.0)	2 (8.0)
gL	Graphic language				2 (6.0)	2 (6.0)
svzL	Continuous crude sex-related language			1 (5)		1 (5)
qzL	Brief sex-related dialogue			1 (4)		1 (4)
svL	Pervasive vulgar language				1 (10)	1 (10)
	Grand Total	51 (0.7)	169 (2.1)	462 (4.1)	587 (7.1)	1269 (5.1)

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