

RESEARCH LETTER

Tobacco Brand Appearances in Movies Before and After the Master Settlement Agreement

To the Editor: Product placement in movies has long been used to promote cigarette sales and brand awareness.¹ The November 1998 Master Settlement Agreement (MSA) between state attorneys general and major tobacco companies prohibits payment for tobacco brand placement in movies.² To evaluate whether the MSA has affected the number of tobacco brand appearances (TBAs) in movies, we analyzed the top 100 US box-office films per year for 1996-2003.

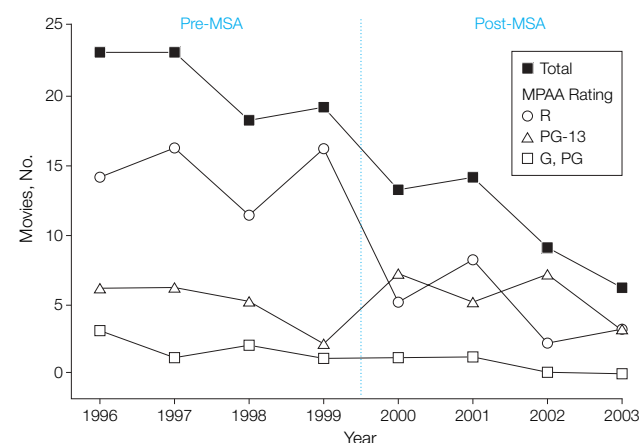
Methods. Because most movies released in 1999 were in production prior to the MSA, we used year of release to classify movies as pre-MSA (1996-1999; n=400) or post-MSA (2000-2003; n=400). Using previously validated methods,^{3,4} 2 coders viewed theater versions of movies on videotape or DVD (except 1 IMAX movie viewed and coded in the theater) and recorded the number of times a tobacco brand appeared and which brands were shown in each movie. All TBAs identified by the coders were confirmed by an independent rater. The coders had the ability to stop-view any scene multiple times for clarification, and consensus was reached on any discrepancy. We defined a TBA as the depiction of a brand name, logo, or identifiable trademark and used a 3-point index for the degree of recognition: 1=suggested but uncertain (n=139); 2=reasonably certain but name not visible (n=96); 3=brand/logo clearly visible (n=138). After excluding appearances coded as uncertain, 234 TBAs in 125 movies were analyzed.

Pre-MSA and post-MSA movies were compared in the following ways: Odds ratios (ORs) and exact confidence intervals (CIs) and significance levels were calculated to compare the number of movies with TBAs. Logistic regression was used to compare the change in the proportion of movies with TBAs across the Motion Picture Association of America rating categories⁵ and to examine trends over time based on the year of release. The Wilcoxon rank-sum test

was used to compare the number of TBAs per movie. Statistical significance was defined as $P < .05$. Analyses were conducted using SAS, version 9.1.3 (SAS Institute Inc, Cary, NC) and STATA, version 8.0 (Stata Corp, College Station, Tex).

Results. The overall number of movies with brand appearances appeared to decrease annually post-MSA, but the test for trend was of marginal statistical significance ($P = .06$); no decrease was seen pre-MSA ($P = .35$) (FIGURE). While the overall percentage of movies with TBAs dropped from 20.8% pre-MSA to 10.5% post-MSA (OR, 0.45; 95% CI, 0.29-0.68), this decrease was not consistent across ratings (TABLE). The percentage of R-rated movies with TBAs dropped from 29.8% pre-MSA to 13.3% post-MSA (OR, 0.36; 95% CI, 0.19-0.67). The decline in the percentages of PG-13-rated and G/PG-rated movies with TBAs was not statistically significant. The OR for the number of R-rated movies containing brand appearances was about half that for PG-13-rated movies (OR, 0.76; 95% CI, 0.37-1.57); this difference was not statistically significant ($P = .09$).

Figure. Number of Top 100 US Box-Office Movies in Each Year With Tobacco Brand Appearances by MPAA Rating



MPAA indicates Motion Picture Association of America; MSA, Master Settlement Agreement. Tests for trend of an annual decrease were $P = .35$ pre-MSA and $P = .06$ post-MSA.

Table. Tobacco Brand Appearances in Top US Box-Office Movies Pre-MSA (1996-1999) and Post-MSA (2000-2003) by MPAA Rating

MPAA Rating	No. of Movies Coded		Movies With Tobacco Brand Appearances				No. of Tobacco Brand Appearances per Movie*		
	Pre-MSA	Post-MSA	Pre-MSA, No. (%)	Post-MSA, No. (%)	OR (95% CI)†	P Value‡	Pre-MSA, Median (Range) (n = 83)	Post-MSA, Median (Range) (n = 42)	P Value§
G, PG	82	79	7 (8.5)	2 (2.5)	0.28 (0.03-1.5)	.17	1.0 (1-1)	2.0 (2-2)	.03
PG-13	127	186	19 (15.0)	22 (11.8)	0.76 (0.37-1.6)	.50	2.0 (1-7)	1.0 (1-10)	.33
R	191	135	57 (29.8)	18 (13.3)	0.36 (0.19-0.67)	<.001	1.0 (1-10)	1.0 (1-2)	.01
Total	400	400	83 (20.8)	42 (10.5)	0.45 (0.29-0.68)	<.001	1.0 (1-10)	1.0 (1-10)	.04

Abbreviations: CI, confidence interval; MPAA, Motion Picture Association of America; MSA, Master Settlement Agreement; OR, odds ratio.

*Based on movies containing at least 1 tobacco brand appearance.

†Calculated as post-MSA odds of tobacco brand appearances divided by pre-MSA odds of tobacco brand appearances.

‡By Fisher exact test.

§By Wilcoxon rank-sum test.

The number of TBAs per movie decreased significantly, primarily because of the significant decrease in TBAs in R-rated movies (Table). Of the movies with TBAs, 79.5% had MSA signatory brands (Philip Morris, R. J. Reynolds, and Brown and Williamson) pre-MSA vs 69.0% post-MSA ($P=.27$). Among PG-13-rated and R-rated movies with TBAs, there was a decrease in the proportion of movies with MSA signatory brands that was not statistically significant (PG-13-rated movies: 84.2% to 77.3%; $P=.70$; R-rated movies: 78.9% to 61.1%; $P=.21$). Of all the brands that appeared in the 125 movies with TBAs, Marlboro (Philip Morris) appeared the most frequently (48.8%).

Post hoc analyses including movies coded with uncertain TBAs did not change the findings regarding the percentage of movies with TBAs, but the decrease in the number of TBAs per movie was no longer significant ($P=.12$).

Comment. There has been a marked decline in the number of movies with TBAs released after the MSA. However, the greatest absolute decrease occurred in R-rated movies, and the decrease seen in movies rated for adolescent audiences was not statistically significant. Although this may reflect limited power of this study, almost 1 in 8 top US box-office movies directly marketed to adolescents continue to feature TBAs. A limitation of this study is that we did not identify who was responsible for the TBAs. If tobacco companies do not pay movie studios to portray tobacco brands, they are not in violation of the MSA. Whether or not payment was received, the continued presence of tobacco brands in movies undermines the intent of the MSA.

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