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Young adults' support for adult-ratings for movies depicting smoking and for restrictions on tobacco magazine advertising

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Abstract

Introduction—Smoking images in movies and tobacco advertisements in magazines are influential on adolescent smoking behaviors, and restrictions of these advertising strategies can reduce the prevalence of adolescent smoking. We assessed young adults' level of support for adult ratings for movies depicting smoking and for restrictions on tobacco magazine advertising.

Methods—Young adults from the U.S. Midwest were surveyed between 2010–2011 (n=2622). We assessed their level of support for (a) adult-rating all movies depicting smoking, and (b) restrictions on tobacco magazine advertising. Multivariate regression models were used to investigate the characteristics associated with higher level of support for these policies.

Results—Overall, 34% of the participants favored adult ratings for movies with smoking images, and 68% favored restrictions on tobacco magazine advertising. Characteristics associated with higher level of support differed somewhat by policy.

Conclusion—Further educating young adults about the influence of smoking images in movies on adolescent smoking may be necessary to gain more support for the policy. With the majority supporting restrictions on tobacco magazine advertising, it may be possible to tighten these restrictions to further protect adolescents. Future research is needed to identify how tobacco control advocates can frame these issues to gain further public support.

INTRODUCTION

Tobacco use remains an ongoing public health problem in the United States. According to the National Adult Tobacco Survey 2009–2010, 1 in 4 adults (ages 18 or above) currently use tobacco. (King et al. 2012) Tobacco advertising has been shown to be influential on individual's smoking behaviors. (National Cancer Institute 2008; U.S. Department of Health and Human Services 2012) For example, tobacco companies have been engaged in product placement activities to ensure smoking is prominently portrayed in movies. (Mekemson and Glantz 2002) These activities are supposed to be prohibited by the 1998 Master Settlement Agreement (MSA), a result of litigation brought by the states and territories in the United States against the major tobacco companies (Philip Morris USA, R.J. Reynolds, Brown &

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Williamson, and Lorillard). (State of California Department of Justice Office of the Attorney General 2013) However, a recent study showed that 49% of top-grossing movies in the U.S. in 2009 still contained images of tobacco use. (Glantz et al. 2010) Tobacco companies also advertise in magazines to promote their products. The Federal Trade Commission's recent reports show that tobacco companies spent US\$57.5 million to advertise their products in magazines. (2012a, 2012b)

Policy interventions have been used to reduce the influence of tobacco advertising on the population. Specifically, as a corresponding intervention to reduce the influence of smoking images in movies, the World Health Organization has proposed assigning adult ratings to movies that depict smoking. (World Health Organization 2009) The MSA prohibits tobacco companies from targeting their magazine advertising to youth. However, little is known about public support for these policy interventions. One study surveyed parents from northern New England in 2002–2003 on their attitudes about considering smoking depictions in movies as part of the Motion Picture Association of American (MPAA) Rating System, and found that 28.9% supported assigning an adult rating to movies that depict smoking. (Longacre et al. 2009) A study by Pacheco and colleagues reported, (2011) based on the 2002 Current Population Survey – Tobacco Use Supplement, that 46% of U.S. adults support banning tobacco advertising in general; however, the study did not examine the support for restricting specific types of tobacco advertising.

In light of the limitation of the current literature in documenting the support for adult rating movies that depict smoking and restriction on tobacco advertising in magazines, we believe that understanding young adults' support for these policy interventions is particularly important for several reasons. First, young adulthood (ages 18–29) (Arnett 2000) represents the final stage of behavioral development in smoking, with 19% of those who tried a cigarette experimenting with smoking during this period, and 35% of daily smokers started smoking daily during this period. (U.S. Department of Health and Human Services 2012) Young adults also have the highest prevalence of tobacco use in the United States among all age groups, with 1 in 3 young adults currently using tobacco. (King et al. 2012) Second, young adults are disproportionately exposed to smoking images in movies and tobacco magazine advertising. This is because they are more likely than other age groups to go to movies, (Motion Picture Association of America 2012) and tobacco companies often advertise in magazines with high young adult readership. (Kantar Media 2013; Experian Marketing Services 2013) Studies have shown that young adults' exposure to smoking images in movies is positively associated with their smoking behaviors. (Song et al. 2007; Shmueli et al. 2010) Third, young adults (ages 18–29) are an important voter population, making up 18% of all voters. (Jonathan M. Tisch College of Citizenship and Public Service 2008) Since policymakers (particularly elected officials) pay attention to public support for various policy issues, understanding young adults' support for these policy interventions on tobacco advertising may help motivate policymakers to support these interventions. To date, there are no data among young adults on their support for these policy interventions. Furthermore, smoking images in movies and tobacco advertisements in magazines are two quite different policy issues. The public may not be aware of tobacco companies' involvement in portrayal of smoking in movies, but is aware that tobacco advertisements in

magazines are paid for by the tobacco companies. Whether public support for these two policy issues differ from each other is currently unknown.

Using the data collected through the Minnesota Adolescent Community Cohort Study, the objective of this study was to investigate and contrast young adults' support for adult-ratings for movies with smoking depictions and for restrictions on tobacco advertisements in magazines. We also assessed the characteristics associated with supporting these tobacco control policy interventions among young adults. Findings from this study may inform adoption and implementation of these policy interventions.

METHODS

Study Population

Participants were from the Minnesota Adolescent Community Cohort (MACC) study, a population based prospective cohort study examining tobacco use patterns among adolescents and the effects of state and local level tobacco prevention and control programs on Minnesota adolescents and young adults. A detailed description of the cohort is available. (Forster et al. 2011) In short, recruitment occurred through cluster random sampling of 60 (out of 126) geo-political units (GPUs) in Minnesota, and five GPUs from North Dakota, South Dakota, Michigan and Kansas. Modified random digit dialing along with probability and quota sampling methods resulted in a consistent distribution from ages 12 to 16 from 2000 to 2001 (n=4241, recruitment rate=58%). An additional cohort of 585 12-year-olds from the 60 Minnesota GPUs was sampled through random digit dialing from 2001 to 2002 (n=585, recruitment rate=64%). The resulting overall sample included 4,826 adolescents. Participants were surveyed every six months through computer-assisted telephone interviewing through 2008 (except in 2004 due to a funding gap), and every 12 months from 2008 to 2012. Data for this analysis were collected between October 2010 and March 2011. Participants who were deceased, had refused to continue their participation in prior surveys, and those who could not be contacted for three consecutive surveys were ineligible for data collection. Of those eligible (n=3796), 2,622 completed the interview (response rate=69%). The University of Minnesota Institutional Review Board approved this study.

Measures

Pertaining to independent variables, we measured four demographic variables (age, gender, race/ethnicity and education level). Race/ethnicity was categorized into non-Hispanic White versus other due to few participants in categories other than non-Hispanic White categories. Participants were asked to report the highest level of education they had achieved, or type of school they currently enrolled in, if they were in school. Other independent variables included living with a smoker (yes/no), the number of close friends who smoke (dichotomized to whether they had close friends who smoke), any tobacco use in the past 30 days (including cigarettes and smokeless tobacco; yes/no), and whether they had received direct mail from tobacco companies in the past six months (yes/no). We chose any tobacco use in the past 30 days over cigarette smoking in the past 30 days because various types of tobacco products (both cigarettes and smokeless tobacco) are advertised in magazines. Our two outcome measures are based on two survey items: (a) "Are you in favor of or against

rating all movies with smoking as ‘R’ rated (i.e., an adult rating in the U.S.)?” and (b) “Are you in favor of or against restricting tobacco advertising in magazines?” Participants were provided with four options for both items: strongly against [1], against [2], favor [3], and strongly in favor [4].

Statistical Analysis

We first calculated descriptive statistics for all measures. We then used chi-square tests and t-tests to examine bivariate associations between each outcome variable and all independent variables. Variables associated with the outcome in the bivariate analysis ($p < 0.2$ were included in multivariate analyses). For the outcome measuring support for adult rating for movies with smoking depictions, we treated the outcome variable as an ordinal categorical variable using a proportional odds model. We tested the model to ensure that it did not violate the proportional odds assumption. For the outcome measuring support for restricting tobacco advertising in magazines, we used a general linear model, because the proportional odds model violated the proportional odds assumption. Because of model complexity, we were unable to control for clustering by GPU in the proportional odds model. To investigate the impact of this modeling limitation, we assessed the similarity in support for each policy intervention among participants from a particular GPU through estimating the intra-class correlations (ICC) of the support for each policy intervention by GPU. We found that the ICCs by GPU for supporting these policy interventions were small and non-significant ($ICC < 0.006$, $p > 0.15$). This indicated that our results would not be severely biased if we did not adjust for clustering by GPU. Therefore, we decided to present more parsimonious models without adjusting for clustering. All analyses were conducted in SAS® version 9.2. (SAS Institute, Cary, North Carolina) Statistical significance for multivariate analyses was set at $p < 0.05$.

RESULTS

Descriptive statistics of all measures are presented in Table 1. Participants were 24 years old on average, 53% were female 89% were non-Hispanic White, and 59% enrolled in or graduated from a four-year college. About 23% lived with a smoker, and about 53% had one or more close friends who smoke. The prevalence of past 30-day tobacco use was slightly over 30%. Participants who were lost to follow-up at this round were more likely to be male and from racial minority groups ($p < 0.05$). Of all participants, 2562 (97.7%) responded to the question on adult rating movies depicting smoking images, and 2522 (96.2%) responded to the question on restricting tobacco advertising in magazines. Among those who responded, 34% of the participants favored adult-ratings for movies with smoking images (4% strongly favor, 30% favor), while the majority were against this policy intervention (43% against, 23% strongly against). Pertaining to tobacco advertising in magazines, over two-thirds of the participants were in favor of restricting tobacco advertising in magazines (37% strongly favor, 31% favor), while few were against the policy intervention (21%), and even fewer were strongly against the policy intervention (11%).

Table 2 presents the distribution of support for adult ratings for movies with smoking images by each independent variable and the adjusted odds ratios from multivariate

proportional odds model. We found that young women (versus young men), young adults of race/ethnicity other than non-Hispanic White (versus non-Hispanic White), and young adults with 2-year college education or less (versus those with 4-year college education) had higher odds of reporting higher levels of support for the policy intervention to assign movies with smoking an adult rating ($p<0.05$). In contrast, young adults who had friends who smoke (versus those who did not have) and young adult past 30-day tobacco users (versus those who did not use tobacco in the past 30 days) had lower odds of reporting higher levels of support for this policy intervention ($p<0.05$).

Table 3 shows the distribution of support for restriction of tobacco advertising in magazines by each independent variable and the adjusted regression coefficients from the multivariate linear regression model. We observed that young women reported higher levels of support than young men for restricting tobacco advertising in magazines ($p<0.01$). Young adults with 2-year college education or less (versus those with 4-year college education), those of race/ethnicity other than non-Hispanic White (versus non-Hispanic White), and those who used tobacco in the past 30 days (versus those who did not use tobacco in the past 30 days) reported lower level of support for restricting tobacco advertising in magazines ($p<0.05$). Young adults who received tobacco direct mail in the past six months also reported a lower level of support for this policy intervention when compared to those who did not receive tobacco direct mail ($p=0.04$).

DISCUSSIONS, CONCLUSIONS AND POLICY IMPLICATIONS

Understanding young adults' opinions on tobacco control policies is an important element when advocating for particular policies. When examining the level of support among young adults for adult-rating movies with smoking images, we found that only a minority of our regional young adult sample was in favor of this policy intervention. Our data suggest that advocates for this policy would likely face opposition among young adults. Further education on the impact of smoking in movies on adolescent smoking through health communication interventions may be needed to gain young adults' support. We observed that about two-thirds of those who were against the policy reported "against" instead of "strongly against". This may imply that the majority of the young adults who oppose the policy intervention did not hold strong opinion against the intervention, and therefore may be persuadable.

Our findings showed a lack of support for adult-ratings for movies with smoking occurred particularly among young men, those with higher education, those who have friends who smoke, and those who used tobacco in the past 30 days. Regarding the finding related to education, a previous study on parental attitudes toward assigning an adult rating for movies depicting smoking also found that parents of lower education were more likely to support the policy intervention, but the investigators did not offer potential explanations for this finding. (Longacre et al. 2009) We speculate that exposure to smoking images in movies may explain the association. A study conducted by the Kaiser Family Foundation found that adolescents (aged 8–18 years) of lower socioeconomic status spent more time than those of higher socioeconomic status watching movies. (Rideout et al. 2010) Perhaps, this trend continues into young adulthood and young adults of lower socioeconomic status may have

seen more smoking in movies and be more likely to realize the pervasiveness of smoking images in movies. This may in turn provoke higher level of support for this policy among young adults of lower socioeconomic status.

We found that 68% of young adults in our sample were in favor of restricting tobacco advertisements in magazines (37% strongly favor; 31% favor). As mentioned previously, under the MSA, the four major U.S. tobacco companies agreed not to advertise cigarettes in magazines with substantial youth readership (defined as over 15% or 2 million readers under the age of 18). Given the high support of restricting tobacco advertisement in magazines, and the majority who opposed the restrictions were “against” instead of “strongly against”, it may be appropriate to further tighten this restriction (e.g., apply this restriction to all tobacco products, including electronic cigarettes, and all manufacturers, including those who did not participated in the MSA, such as Swedish Match), and/or lower the definition of “substantial youth readership”.

To further improve the support for restricting tobacco advertising in magazines, advocates for this policy may need to gain support from young men, young adults from racial/ethnic minorities, young adults of lower education, young adults who have friends who smoke, and young adult tobacco users. We noted that while the association between education and support for adult rating movies with smoking images was positive, the association between education and support for restrictions for tobacco advertising in magazine is negative. We speculate that exposure to tobacco magazine advertisements may explain this finding. When examining the data from a national consumer survey, we found that adults with lower education level were less likely to read magazines in general. (Experian Marketing Services 2013) Consequently, they may be less likely to be aware of the pervasiveness of tobacco magazine advertisements and therefore less likely to support restrictions on these advertisements. We observed that young adults who received direct mail materials from the tobacco industry reported lower levels of support for restricting tobacco advertising in magazines than those who did not receive tobacco direct mail, even after adjusting for their tobacco use status. A previous study reported that adult smokers who received cigarette coupons thought more positively about the cigarette companies. (Choi et al. 2012) Since some of these coupons were distributed through direct mail, it is plausible that young adults who received these direct mailing are benefiting from them, and therefore less likely to support restriction on tobacco advertising.

Levels of support differ greatly between the two policy interventions. Our previous work showed that public support for the statewide clean indoor air policy increased after the implementation of the policy. (Fabian et al. 2011) Since restrictions on tobacco advertising in magazines have been in place since 1998 through MSA, this policy intervention had more time to gain young adult support. In contrast, no regulations to date automatically assign more restrictive ratings to movies with any specific content. Given the concept is new, and its potential conflict with the freedom of speech, (Chapman 2008) it may take some time and active effort on advocating for the policy before it gains support from the majority of the public.

Since our sample of young adults was only recruited from the U.S. Midwest region, and the majority of the sample was non-Hispanic White, our findings may not be generalizable to states with higher racial/ethnic diversity, and to the general adult population. Due to the disproportional attrition of racial ethnic minorities, it is possible we underestimated the associations between race/ethnicity and support for the two policy issues. We were unable to control for political culture/climate of the U.S. Midwest states, or individuals' exposure to smoking images in movies and tobacco advertising in magazines because we did not collect this information. The policy interventions which we assessed support for were rather general (especially restrictions for tobacco advertising in magazines). Future studies need to assess support for more specific policy interventions (e.g., prohibiting tobacco advertising in all magazines), and explore arguments that would increase the public's support on these policy interventions. Attrition over the study period may also undermine the representativeness of the sample. However, since we found that the prevalence of tobacco use in our sample was comparable to that of a state-representative sample, ("Tobacco Use in Minnesota: 2010 Update" 2011) we believe that our estimates are unlikely to be highly biased. Another limitation of the study was that we were unable to use a proportional odds regression model to assess the characteristics associated with the level of support for restricting tobacco advertising in magazines because the data distribution violated the proportional odds assumption. However, our results remained robust when we dichotomized the support level into "in favor" or "against", suggesting that the choice of model has little influence on the results.

In conclusion, we found that a *minority* of young adults supported adult-rating movies with smoking images while a *majority* of them supported restricting tobacco advertising in magazines. Future studies need to understand how tobacco control advocates can frame these issues to gain further support for these policy interventions across various subgroups.

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Table 1

Characteristics of the young adult participants who did and did not complete the survey.

	Completed (n=2622) N (%)	Missing (n=1174) N (%)	p-value
Age	24.0 (1.7)	24.1 (1.6)	0.42
Gender			
Female	1382 (53%)	573 (49%)	0.03
Male	1240 (47%)	601 (51%)	
Race/ethnicity			
Other	277 (11%)	191 (16%)	<0.01
Non-Hispanic White	2345 (89%)	983 (84%)	
Education			
High school or less	409 (16%)	--	--
Enrolled/graduated from 2-yr colleges	654 (25%)		
Enrolled/graduated from 4-yr colleges	1555 (59%)		
Living with a smoker			
Yes	599 (23%)	--	--
No	2023 (77%)		
One or more close friends smoke			
Yes	1387 (53%)	--	--
No	1235 (47%)		
Used tobacco in past 30 days			
Yes	822 (31%)	--	--
No	1800 (69%)		
Received tobacco direct mail in the past 6 months			
Yes	336 (13%)	--	--
No	2286 (87%)		
Support for R-rating movies with smoking images			
Strongly Favor	100 (4%)	--	--
Favor	780 (30%)		
Against	1090 (43%)		
Strongly Against	592 (23%)		
Support for restriction of tobacco advertisement in magazines			
Strongly Favor	932 (37%)		
Favor	782 (31%)	--	--
Against	533 (21%)		
Strongly Against	275 (11%)		

Mean and standard deviations are presented for age. Ages of participants who did not complete the survey were calculated from baseline. P-values were obtained through chi-square tests (for categorical variables) and two-sample t-test (for continuous variables).

Table 2

Multivariate proportional odds model: Support for adult ratings for movies with smoking images (n=2562).

Correlates	Strongly Against N (%)	Against N (%)	Favor N (%)	Strongly Favor N (%)	Bivariate p-value	Multivariate p-value	Adjusted odds ratio (95% CI)
Age	24.1 (1.7)	24.0 (1.7)	24.1 (1.7)	24.0 (1.7)	0.27	--	--
Gender							
Female	205 (15%)	570 (43%)	500 (37%)	71 (5%)	<0.01		2.19 (1.88, 2.54)
Male	387 (32%)	520 (43%)	280 (23%)	29 (2%)			Ref.
Race/ethnicity							
Other	42 (15%)	125 (46%)	94 (35%)	11 (4%)	0.02	0.04	1.28 (1.01, 1.62)
Non-Hispanic White	550 (24%)	965 (42%)	686 (30%)	89 (4%)			Ref.
Education							
High school or less	93 (24%)	163 (41%)	116 (30%)	21 (5%)	0.17	<0.01	1.44 (1.16, 1.79)
Enrolled/graduated from 2-yr colleges	147 (23%)	252 (39%)	212 (33%)	29 (5%)			1.29 (1.08, 1.54)
Enrolled/graduated from 4-yr colleges	352 (23%)	675 (44%)	449 (30%)	50 (3%)			Ref.
Living with a smoker							
Yes	164 (28%)	240 (41%)	164 (28%)	20 (3%)	0.02	0.17	0.88 (0.74, 1.06)
No	428 (22%)	850 (43%)	616 (31%)	80 (4%)			Ref.
One or more close friends smoke							
Yes	360 (26%)	580 (43%)	370 (27%)	48 (4%)	<0.01	<0.01	0.79 (0.67, 0.93)
No	232 (19%)	510 (43%)	410 (34%)	52 (4%)			Ref.
Used tobacco in past 30 days							
Yes	258 (32%)	334 (41%)	189 (24%)	27 (3%)	<0.01	<0.01	0.69 (0.58, 0.82)
No	334 (19%)	756 (43%)	591 (34%)	73 (4%)			Ref.
Received tobacco direct mail in the past 6 months							
Yes	88 (27%)	140 (42%)	91 (27%)	14 (4%)	0.37	--	--
No	504 (22%)	950 (43%)	689 (31%)	86 (4%)			

Mean and standard deviations are presented for age. P-values for bivariate analysis were obtained through chi-square tests (for categorical variables) and twosample t-test (for continuous variables). Variables with p<0.2 in bivariate analysis were included in the multivariate proportional odds model to prevent over adjusting. Bolded estimates are statistically significant (p<0.05). CI=confidence interval.

Table 3

Multivariate linear regression model: Support for restriction of tobacco advertising in magazines (n=2522).

Correlates	Strongly Against N (%)	Against N (%)	Favor N (%)	Strongly Favor N (%)	Bivariate p-value	Multivariate p-value	Adjusted regression coefficient (95% CI)
Age*	24.2 (1.7)	24.0 (1.6)	24.0 (1.7)	24.1 (1.6)	0.30	--	--
Gender							
Female	146 (11%)	231 (17%)	361 (27%)	614 (45%)	<0.01		0.22 (0.14, 0.30)
Male	129 (11%)	302 (26%)	421 (36%)	318 (27%)			Ref
Race/ethnicity							
Other	39 (15%)	66 (25%)	70 (26%)	92 (34%)	0.04	0.04	-0.13 (-0.26, -0.01)
Non-Hispanic White	236 (10%)	467 (21%)	712 (32%)	840 (37%)			Ref
Education							
High school or less	62 (16%)	117 (31%)	102 (27%)	99 (26%)	<0.01	<0.01	-0.28 (-0.40, -0.17)
Enrolled/graduated from 2-yr colleges	72 (12%)	145 (23%)	200 (32%)	208 (33%)			-0.11 (-0.20, -0.01)
Enrolled/graduated from 4-yr colleges	141 (9%)	271 (18%)	479 (32%)	622 (41%)			Ref
Living with a smoker							
Yes	59 (10%)	158 (28%)	192 (33%)	165 (29%)	<0.01	0.49	-0.03 (-0.13, 0.06)
No	216 (11%)	375 (19%)	590 (31%)	767 (39%)			Ref
One or more close friends smoke							
Yes	143 (11%)	344 (26%)	425 (32%)	405 (31%)	<0.01	0.05	-0.09 (-0.17, 0.00)
No	132 (11%)	189 (15%)	357 (30%)	527 (44%)			Ref
Used tobacco in past 30 days							
Yes	90 (12%)	221 (28%)	270 (35%)	196 (25%)	<0.01	<0.01	-0.13 (-0.23, -0.04)
No	185 (11%)	312 (18%)	512 (29%)	736 (42%)			Ref
Received mailings from tobacco company in the past 6 months							
Yes	45 (14%)	93 (29%)	99 (31%)	85 (26%)	<0.01	0.04	-0.13 (-0.25, -0.01)
No	230 (10%)	440 (20%)	683 (31%)	847 (39%)			Ref

Mean and standard deviations are presented for age. P-values for bivariate analysis were obtained through chi-square tests (for categorical variables) and two-sample t-test (for continuous variables). Variables with p<0.2 in bivariate analysis were included in the multivariate linear regression model to prevent over adjusting. Bolded estimates are statistically significant (p<0.05). CI=confidence interval.