ELSEVIER

Journal of Adolescent Health 36 (2005) 475–485

JOURNAL OF
ADOLESCENT
HEALTH

Original article

The influence of smoking imagery on the smoking intentions of young people: Testing a media interpretation model

Judith P. McCool, Ph.D.[a,*], Linda D. Cameron, Ph.D.[b], and Keith J. Petrie, Ph.D.[a]

[a]*Health Psychology Department, Faculty of Medical and Health Sciences, University of Auckland, Auckland, New Zealand*
[b]*Department of Psychological Medicine, Faculty of Science, University of Auckland, Auckland, New Zealand.*

Manuscript received August 1, 2003; manuscript accepted March 4, 2004.

Abstract

Purpose: To assess a theoretical model of adolescents' exposure to films, perceptions of smoking imagery in film, and smoking intentions.

Methods: A structured questionnaire was completed by 3041 Year 8 (aged 12 years) and Year 12 (aged 16 years) students from 25 schools in Auckland, New Zealand. The survey assessed the relationships among exposure to films, attitudes about smoking imagery, perceptions of smoking prevalence and its acceptability, and expectations of smoking in the future. Measures included exposure to films, perceived pervasiveness of, and nonchalant attitudes about smoking imagery, identification of positive smoker stereotypes in films, perceived smoking prevalence, judgment of smoking acceptability, and smoking expectations. Path analytic techniques, using multiple regression analyses, were used to test the pattern of associations identified by the media interpretation model.

Results: Hierarchical regression analyses revealed that film exposure predicted higher levels of perceived smoking prevalence, perceived imagery pervasiveness, and nonchalant attitudes about smoking imagery. Nonchalant attitudes, identification of positive smoker stereotypes, and perceived smoking prevalence predicted judgments of smoking acceptability. Acceptability judgments, identification of positive stereotypes, and perceived smoking prevalence were all positively associated with smoking expectations. The media interpretation model accounted for 24% of the variance in smoking expectations within the total sample.

Conclusions: Smoking imagery in film may play a role in the development of smoking intentions through inflating the perception of smoking prevalence and presenting socially attractive images.

Keywords: Adolescents; Film imagery; Tobacco use

Until the mid 1990s, minimal research was devoted to investigating the role of media in the dissemination of popular images of smoking and tobacco use. Since then, research has provided a better understanding of the proliferation of smoking imagery in popular media [1–3]. Yet information pertaining to adolescents' perceptions and interpretations of smoking imagery in everyday media remains limited. Recent findings from qualitative studies have contributed an analysis of the meanings young people attach to representations of tobacco use in film [4–6]. These findings suggest that not only are young people aware of the prevalence of smoking imagery, but that images are especially salient if they are located within a familiar or desired social or cultural context. Images that resonate with real life experiences and lay beliefs about tobacco use are widely considered realistic and appropriate in many cinematic contexts. In essence, images of tobacco use in films, even highly stereotypical images, hold some meaning for young people through referencing expectations of their own social world. Sargent et al. suggest that smoking images in film are likely to be even more salient than smoking evidenced

*Address correspondence to: Judith P. McCool, University of Auckland, faculty of Medical and Health Sciences, Private Bag 92019, Auckland, New Zealand.

E-mail address: j.mccool@auckland.ac.nz

1054-139X/05/$ – see front matter
doi:10.1016/j.jadohealth.2004.03.006

within the community as actors embody desired social personas and situations [7].

Although various studies have explored the relationships between tobacco use in film with smoking beliefs and behaviors, it remains unclear to what extent smoking in film influences smoking behavior alongside other cultural and inter- and intrapersonal factors. Sargent et al. found that viewing films containing smoking images was associated with higher receptivity to smoking among nonsmokers [7]. This association held even after controlling for other smoking predictors including school achievement, parental and friends smoking, and personality factors. Interestingly, after controlling for these factors, the extent of exposure to movie smoking was not associated with normative views of adolescent smoking but Sargent and colleagues found an association between viewing smoking images in film and trying cigarettes, after controlling for other smoking predictors [3]. In explanation, it was suggested that young smokers may be attracted to films in which their favorite actors smoke, as these films help them to "consolidate their beliefs" about smoking. Moreover, nonsmokers also reported higher susceptibility to smoking in the future if their favorite actors were smokers. Owing to the cross-sectional design of the study, the direction of this latter effect was not evident. Although the association may result from the actors' influence on smoking susceptibility, it is also possible that nonsmokers who are contemplating smoking are likely to attend to smoking behaviors of stars.

Despite the uncertainty over the direction of effect between viewing films and the development of positive attitudes toward smoking, it is widely argued that film stars are important role models for young people who are interested in developing a desired social identity [8–10]. Tickle et al. acknowledged that their study [10], which assessed the association between having a favorite movie star who smoked and smoking behavior, was limited by the lack of assessment of mediational factors. In particular, their study did not include a measure of perceived smoking norms, which may influence preference of film stars. Indeed, previous studies have also alerted concern regarding the possible impact of smoking imagery in media inflating understandings about the normalcy of smoking in real life [11,12]. Chassin et al. acknowledged the "false consensus" effect, whereby adolescents' perceptions of social phenomena, such as smoking rates, are influenced by their own behavior and the behavior of those within their immediate social environment [13].

Individuals have the capacity to actively negotiate media images, particularly when the imagery contradicts implicit understandings (lay beliefs) about representations of reality [14]. It is likely that the relationships between media imagery and smoking perceptions are complex and mediated by a range of related factors, including pre-existing lay beliefs about smoking behaviors in general [15].

Although theoretical models, such as the Theory of Reasoned Action [16], offer frameworks for understanding patterns of behavioral intention, the media interpretation model specifically address interpretations of media imagery as an important cognitive factor in the formation or support of normative beliefs and behavioral intention. Interpretations of media imagery therefore are hypothesized to support or construct normative understandings of social behavior, which may play a role in the development of an ambivalent attitude toward smoking uptake. Theory of Planned Behavior [17] also offers some support to the medial interpretation model in that again, normative beliefs about smoking are important; however, perceived control over behavioral intention has less significance in this context. Social Learning Theory has been used in the assessment of adolescent responses to smoking in film and other media [10,18]. Film stars are assumed to be desirable and therefore influential role models for young people as they attempt to construct socially acceptable identities for themselves. However, assumptions surrounding the selection of desirable role models, given the variation in youth sub-cultural identities, make this framework problematic.

General cognitive theories do not explicitly address media exposure and interpretations and therefore are unable to account for these effects in determining behavior intention, or outcome. Social representation theory also advances a useful perspective on the relevance of media texts in the construction and influence of normative beliefs [19]. From this perspective, commonly held beliefs or misconceptions about tobacco may also be derived, in part, from media representations of smoking [1,11]. However, commonly held beliefs about social phenomena (e.g., tobacco use), also assist to construct what are perceived within some social groups as "authentic" film representations [14].

The media interpretation model proposes that in addition to normative smoking beliefs, images of tobacco use in film and interpretations of images are important in the development of smoking intentions among young people. Accordingly, using the model as a diagrammatic map for hierarchical multivariate analysis, relationships among film exposure, media interpretations, ambivalence, and intention to smoke may be assessed. Accordingly, if tobacco use is perceived to be a normative social behavior within an adolescent social group, filmic representations of smoking are less likely to be challenged unless those representations are perceived to be patently phony or else contradict prior expectations of smoking behavior. Interestingly, Chassin et al. assessed the relevance of direct experiences with smoking on the establishment of smoking attitudes as well as their relationship with behavioral intentions [20]. Their findings support the concept that direct experience enhances the consistency between adolescents' attitudes toward smoking and their smoking behaviors. The media interpretation model pro-

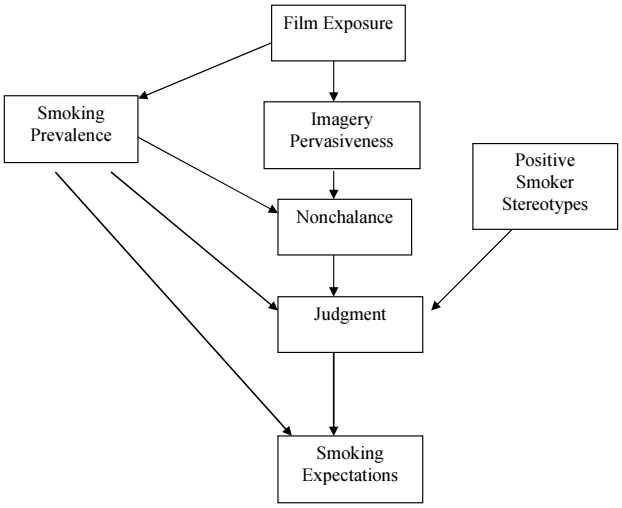

Fig. 1. Media Interpretation Model.

poses that young people are active in their interactions with media and that their interpretations are derived from lay theories represented in both the media world and the real world [21]. It is possible that perceived prevalence of smoking might be analogous to a direct experience with smoking in terms of developing a tolerant or accepting attitude toward tobacco use. Adolescents' smoking beliefs are developed over time and reflect media-inspired self and social identities, as well as their own immediate familial, cultural, and social environments [15,21,22].

Theoretical model of responses to smoking imagery in film

The media interpretation model presented in Figure 1 represents the proposed relationships among perceptions of film depictions of tobacco use, perceptions about the acceptability of smoking, and beliefs about future smoking behavior. The media interpretation model was developed on the basis of the findings from qualitative studies [5,6] and it proposes that interpretations of smoking imagery in film are associated with various factors, including extent of film exposure, pre-existing beliefs about the prevalence of smoking, nonchalance toward smoking in real life, and judgments about the acceptability of tobacco use [5,6]. The key constructs included within the media interpretation model are described below in detail.

Film exposure

The film exposure construct refers to frequency of viewing films. Young people watch films more frequently than do adults, and they are more likely to observe the on-screen and off-screen behaviors of their favorite film stars [9,12]. Distefan et al. also found that only 13.8% of students in their study could not name a favorite film actor or actress, indicating that film stars potentially hold an important place in young people's lives. There is some concern that adolescents seek to emulate the image and behavior of their preferred film stars [12]. In addition, some theorists believe that it is not merely exposure to preferred films or film stars that influences viewer's perceptions and behaviors; rather, the extent of film viewing is also highly relevant [7,22,23]. Watching films frequently may lead to the development of an accepting and conformist view of dominant media depictions of socially sanctioned behaviors such as tobacco use [14,19]. According to social representation theory, the viewer's perception or representation of the image assists to construct common understandings about everyday phenomena by drawing upon representations of the real world that resonate with experience or expectation [14]. These representations foster and consolidate ideas about fundamental social behaviors and ideology. From this perspective, it is possible that individuals who report that they frequently view films will tend to hold beliefs that smoking imagery is pervasive in films and that the prevalence of smoking in real life is high.

Imagery pervasiveness

Imagery pervasiveness refers to the extent to which smoking images are understood to be pervasive in film. Perceived imagery pervasiveness is anticipated to be promoted by film exposure. Previous studies have identified that images of tobacco use are common in film and magazines [4,11], and qualitative findings indicate that smoking images are understood by adolescents to be common and perfunctory elements of the cinematic experience and, in many situations, accurate depictions of reality [5,6]. Perceived imagery pervasiveness is expected to promote nonchalant attitudes of indifference regarding the use of smoking images in films

Smoking prevalence

Smoking prevalence refers to the extent to which tobacco use is thought to be common and normal in young people's immediate social environments. Previous studies have indicated concern about the pervasiveness of smoking images in film and the prospect that filmic representations of smoking create erroneous beliefs about actual smoking prevalence [1,9,12]. Qualitative analyses identified that filmic representations of tobacco use are perceived by adolescents to be an accurate reflection of real-life smoking behaviors and prevalence [5,6]. Evidence also suggests that adolescents grossly exaggerate estimates of the prevalence of smoking among their peers and in wider society [25], and that distorted estimates of smoking prevalence among peers are a predictor of both smoking initiation and increases in consumption of tobacco [26]. Therefore, exposure to pervasive representations of tobacco use in film is expected to influence smoking prevalence beliefs.

Nonchalance (toward smoking imagery in film)

Research indicates that young people may hold predominantly ambivalent or nonchalant views about tobacco imagery in films [6]. Their nonchalant attitudes are characterized by a general indifference about the use of smoking imagery in films and the view that such imagery has no impact on their smoking choices. Signorielli and Morgan suggest that frequent exposure to media images (e.g., smoking in film) may desensitize viewers to the presence of certain social phenomena and therefore encourage an indifferent attitude toward the presence of that phenomena (e.g., the inclusion of smoking in films) [23]. It is proposed that film exposure promotes perceptions of the pervasiveness of smoking imagery in film, and that this perceived pervasiveness assists to cultivate or support the belief that smoking is normal and acceptable in film, which mitigates any negative or positive affect toward the imagery [9]. The belief that smoking is a common social behavior also may be associated with a nonchalant attitude toward smoking [27]. Depending on genre, images of tobacco use in film may resonate with either first-hand experience and/or prior expectations of tobacco use and either support (or challenge) an overriding indifference toward the imagery [6]. Thus, nonchalance should be higher if smoking imagery is perceived to be a credible, salient version of reality; that is, the images and performance resonate with prior expectations about smoker types and the prevalence of smoking.

Positive smoker stereotypes

Positive smoker stereotypes refer to commonly identified characteristics of film smokers such as "stylish," "sexy," and "healthy." Qualitative research has revealed that adolescents readily identify these positive, stereotypical images of smokers in films [5]. The term "positive" smoker stereotypes is used to distinguish them from "negative" stereotypes identified by adolescents, which include "stressed," "depressed," "angry," "tough," and other undesirable characteristics. Previous research has found that stereotypes are pervasive in film, and they are typically associated with smokers who display a distinctive style, sub-cultural credibility, and social competence [11]. Amos et al. found that young people actively appraise smoking images, and their appraisals tend to reflect a range of factors, including their own smoking status [11]. For example, smokers tended to positively evaluate and identify with the images reflecting attributes associated with their understanding of a smoker (e.g., "tough" or "wild"). In addition, tobacco use in film may reflect cultural norms that resonate with viewers' expectations of appropriate behaviors or idealized images [11,28]. Previous content analyses have revealed that characters who smoke in films tend to be young, in good health, good looking, intelligent, and high in personal and professional acceptance [1,8,28].

Judgment

The judgment construct refers to perceptions of tobacco acceptability in real life. Qualitative findings suggest that, although adolescents generally do not harbor views that smoking is a positive behavior and that people should smoke, they may express neutral or nonjudgmental views that smoking is an acceptable lifestyle choice [6]. It is reasoned that individuals who are nonchalant about smoking in film are likely to express nonjudgmental views about smoking in general. Neutral and nonjudgmental views are expected to be influenced by perceptions of high smoking prevalence, based on the expectation such perceptions could be construed as indicating that smoking is condoned within the viewer's social group. It is anticipated that identification of positive smoking stereotypes in films will also promote neutral judgments about smoking. Accordingly, individuals who report high scores on positive stereotypes and nonchalance are anticipated to also be higher on judgment.

Smoking expectations

As shown in Figure 1, expectations of future tobacco use represent the final outcome in the media interpretation model. It is anticipated that perceived smoking prevalence and judgment will be directly associated with smoking expectations—that is, with beliefs regarding the likelihood of smoking in the future. The perception that smoking is common and normal within a specific social context has been found to be associated with elevated susceptibility to smoking in the future [26,30,31]. Indeed, research has found that expectations of smoking in the future are predictive of subsequent tobacco use. For example, Distefan et al. found that "never" smokers who reported that they expected to smoke in the future were more likely to do so than were "never" smokers who did not report these expectations [12]. Other studies have also found that smoking susceptibility, as indicated to a great extent by intentions to smoke in the future, is a highly significant predictor of future smoking [30–32]. Smoking intentions were assessed rather than smoking behaviors, as current research on smoking imagery in film suggests that although current smokers may be attracted to smoking images in film, predictors of smoking intentions (among nonsmokers) is more useful for the design of preventive initiatives. An influential series of studies of smoking in film conducted by Sargent and colleagues [3,7] and Tickle and colleagues [10] have consistently used smoking susceptibility as their main outcome measure. To usefully contribute to this debate we used a consistent outcome measure in the analysis of the present study.

The present study was designed to assess the relationship among media exposure, perceptions of smoking prevalence, imagery pervasiveness, nonchalance, judgment, and smoking expectations.

Method

Sampling strategy

A stratified sampling strategy was used to generate two representative samples of Auckland students in Year 8 (approximately 12 years of age) and Year 12 (approximately 16 years of age). The sample was stratified according to the economic decile rank of the school, gender, and ethnicity, all of which are widely accepted to be important predictors of current and future smoking [34–36]. Two secondary and three primary or intermediate schools from each of the 10 decile ranks (1–10, where 10 is the highest rank of economic status) were randomly selected and invited to participate in the survey. The study was assessed and approved by the Auckland University Ethics Committee (ref 2001/088).

Participating schools

In total, 10 secondary schools (76%) and 15 primary or intermediate schools (68%) participated in the study. Two male single-gender schools and one female single-gender school were also included in the sample. All 10 of the secondary schools were defined, according to the New Zealand Ministry of Education, as state integrated (i.e., a private school established to provide education in accordance with the provisions of the Private Schools Conditional Act and is part of the state education system). Contributing schools (schools who take students only up to year 6), state special schools (e.g., schools for the deaf and intellectually handicapped) and independent schools (Te Reo Maori language schools and exclusive religion schools) were excluded from the sample.

Participants

In total, the Media Interpretation Questionnaire was completed by 3041 students, yielding a 91% response rate. Nine percent (n = 301) of the 3342 questionnaires distributed were not entered because they were either incomplete (fewer than half of the items completed), implausible answers were given (i.e., responses were outside the range of scale rating options or unrelated to question), or students declined to participate by not completing any item in the questionnaire.

The mean decile rank for the total sample was 5.4 (median = 5.0, SD = 2.8). The stratified sampling strategy successfully yielded a sample (Table 1) that was representative of the demographic profile of Auckland regional schools. The ethnic distribution of the sample was approximately representative of the greater Auckland region [36]. In the majority of cases, students opted to identify with one ethnic group (92%, n = 2793), with the remainder reporting identification with two (7%, n = 215) or more (0.4%, n = 11) ethnic groups.

Procedure

A passive consent procedure was adopted to allow parents to provide input on the study while preserving the representativeness of the sample and integrity of the study.

Table 1
Sample demographic characteristics

	Year 8 % (n)	Year 12 % (n)
School year	48.1 (n = 1464)	51.8 (n = 1576)
Age (years)	Median = 12	Median = 16
Gender[a]	Male 52.7 (n = 772)	Male 57.6 (n = 908)
	Female 47 (n = 688)	Female 42.1 (n = 663)
Ethnicity		
European	55.5 (n = 813)	53.9 (n = 849)
Maori	12.9 (n = 189)	10.2 (n = 161)
Pacific Island	13.5 (n = 198)	19.5 (n = 308)
Asian	17 (n = 249)	19.3 (n = 304)
Other	5.7 (n = 84)	6.0 (n = 94)
Smoking behavior		
Ever smoker	28.8	66.4
Daily smoker	4	16.3

[a] 11 missing values.

All students were granted consent to participate in the survey. The majority of Year 12 students were over the age of consent (16 years) at the time of surveying and able to participate without seeking parental consent (passive consent). All students were assured that the anonymity and confidentiality of all information collected would be respected. Questionnaires were distributed to students to complete during a compulsory class or after-school assembly. The principal investigator (J.M.) distributed the questionnaires and was present during the completion of the questionnaires. Overall, students took no longer than 15 minutes to complete the questionnaire.

Measures

Film experiences.

The questionnaire included items assessing the following constructs regarding film experiences: film exposure, imagery pervasiveness, nonchalance, and positive stereotypes. For each measure, scores were generated by summing the ratings of the items, after ratings for negatively scaled items were reversed items.

Film exposure was assessed with the following items (Cronbach alpha = .65): (a) "How often do you see a film at the cinema?" (b) "How often do you watch films on video?" and (c) "How often do you watch films on video at friends' places?" The response options ranged from 1 (*very often*) to 5 (*not at all*).

Imagery pervasiveness was assessed with three items (Cronbach alpha = .61): (a) "Smoking in films is common these days"; (b) "In films, it is normal to see actors smoking"; and (c) "In films, people hardly ever smoke." For these items, response options ranged from 1 (*Strongly agree*) to 6 (*Strongly disagree*).

Nonchalance items (Cronbach alpha = .67) consisted of: (a) "Smoking in films is not important to me"; (b) "I don't care whether or not there is smoking in films"; and (c) "Smoking in films makes no difference to me." For these

Table 2
Correlation coefficients for all variables for the total sample (n = 3042)

Variables	1	2	3	4	5	6	7
1. Film exposure	—	—	—	—	—	—	—
2. Imagery Pervasiveness	.19*	—	—	—	—	—	—
3. Smoking Prevalence	.13*	.26*	—	—	—	—	—
4. Judgment	.10*	.11*	.50*	—	—	—	—
5. Nonchalance	.10*	.14*	.20*	.27*	—	—	—
6. Positive Stereotypes	.08*	.04*	.11*	.14*	.00	—	—
7. Smoking Expectations	.11*	.12*	.43*	.43*	.12*	—	—
Mean	28.1	13.4	16.2	14.6	14.0	2.6	.27
SD	4.5	2.9	5.0	5.2	3.7	2.5	.44

* $p < 0.001$.

items, response options ranged from 1 (*Strongly agree*) to 6 (*Strongly disagree*).

Positive stereotypes was assessed with a 5-item measure in which respondents indicate (*yes* or *no*) as to whether they believe that smokers in films are (a) stylish; (b) smart; (c) sexy; (d) healthy; and (e) intelligent (Cronbach alpha = .79).

Measures of smoking beliefs and expectations

Smoking prevalence included the items (Cronbach alpha = .76): (a) "Smoking is common among my friends"; (b) "Smoking is normal among people in my age group"; and (c) "It is normal to see people smoking when they are in social situations." Response options ranged from 1 (*Strongly agree*) to 6 (*Strongly disagree*).

Judgment was assessed with the items (Cronbach alpha = .70): (a) "I don't mind if my friends are smokers"; (b) "I would not judge anyone just because he or she smokes"; (c) "It would bother me if one of my friends smoked"; and (d) "I think it's stupid when people my age smoke." Response options ranged from 1 (*Strongly agree*) to 6 (*Strongly disagree*).

Smoking expectations were assessed using the following items, "How likely is it that you will smoke a cigarette in the next year?" (1 = *Yes, definitely* to 5 = *Definitely not*) and "How likely is it that you will be a smoker in the future?" (1 = *Yes, definitely* to 5 = *Definitely not*).

Data analyses

Pearson's correlation analyses assessed the bivariate associations among the film experience and smoking belief measures, and path analytic techniques using multiple regression analyses were used to test the pattern of associations identified by the media interpretation model (Figure 1). For each analysis, gender, age level, ethnicity, and school decile rank were included as covariates. In each regression analysis, the dependent variable (e.g., imagery pervasiveness) was regressed onto all variables that were hypothesized to have direct associations (e.g., film exposure) or to occur earlier in the hypothesized causal sequence of variables (e.g., smoking prevalence). In all analyses, the significance level was set at $p < 0.01$. An assessment of the direct and indirect association between constructs in the model was also conducted [38].

Results

Correlation analyses

Table 2 presents the Pearson correlation coefficients as well as the means, standard deviations, and ranges for the measures of film experiences and smoking beliefs and expectations. Several theoretically important associations were identified in the analyses. Consistent with the hypothesized path linking film exposure to smoking prevalence beliefs in the media interpretation model, these two variables were positively correlated. Smoking prevalence was associated with imagery pervasiveness ($r = .26$, $p < 0.001$), judgment ($r = .50$, $p < 0.001$), nonchalance ($r = .20$, $p < 0.001$), and smoking expectations ($r = .43$, $p < 0.001$). Smoking expectations were also moderately associated with judgment ($r = .43$, $p < 0.001$).

Imagery pervasiveness

Imagery pervasiveness was regressed onto film exposure and smoking prevalence in addition to the demographic variables (Table 3). Consistent with the media interpretation model, film exposure was significantly associated with higher perceived imagery pervasiveness. Unexpectedly, smoking prevalence was also positively associated with imagery pervasiveness.

Nonchalance

Nonchalance was regressed onto film exposure, smoking prevalence, and imagery pervasiveness, in addition to the demographic variables (Table 3). As hypothesized, smoking prevalence and imagery pervasiveness were both positively associated with nonchalance. Smoking prevalence was also directly associated with higher levels of nonchalance.

Table 3
Multiple regression analyses for total model, (controlling for age level, gender, ethnicity and school SES)

Predictor variables	B	SE B	Beta	t	Total R^2
Imagery pervasiveness					.11
Age level	−.79	.13	−.13	−5.7***	
Gender	.25	.10	.04	2.3*	
Maori ethnicity	.35	.16	.03	2.1*	
Pacific ethnicity	.56	.14	.07	3.1***	
Asian ethnicity	.46	.14	.06	3.9**	
Other ethnicity	.12	.22	.01	.56	
School SES	.07	.11	.01	.64	
Film exposure	.08	.01	.13	7.1***	
Smoking prevalence	.18	.01	.32	13.8***	
Nonchalance					.06
Age level	.82	.17	.11	4.7***	
Gender	−.42	.13	−.05	−3.0**	
Maori ethnicity	.06	.21	.00	.29	
Pacific ethnicity	.36	.18	.03	1.5*	
Asian ethnicity	.51	.18	.05	2.9	
Other	−.30	.28	−.01	−1.0	
School SES	.09	.14	−.01	−.69	
Film exposure	.05	.01	.01	3.6***	
Smoking prevalence	.07	.01	.10	4.1***	
Imagery pervasiveness	.11	.02	.08	4.6***	
Judgment					.31
Age level	1.8	.22	.17	8.4***	
Gender	.13	.17	.01	.75	
Maori ethnicity	−.88	.27	−.05	−3.1**	
Pacific ethnicity	−.06	.24	−.00	−.27	
Asian ethnicity	−.57	.23	.04	2.4	
Other ethnicity	.54	.35	.02	1.4	
School SES	.34	.17	.03	1.9	
Film exposure	.06	.02	.05	3.0**	
Smoking prevalence	.34	.02	.32	14.7***	
Imagery pervasiveness	−.04	.03	−.02	−1.5	
Nonchalance	.26	.02	.18	11.2***	
Positive stereotypes	.23	.03	.11	6.7***	
Smoking expectations (step 1)					
Age level	.94	.07	.22	12.4	.07
Gender	−.10	.07	−.02	−1.3	
Maori ethnicity	−.23	.12	−.03	−1.9	
Pacific ethnicity	.29	.10	.05	2.7	
Asian ethnicity	.68	.10	.12	6.7	
Other ethnicity	.36	.16	.04	2.2	
School SES	.19	.08	.04	2.3	
Smoking expectations (step 2)					
Age level	−.16	.09	−.03	−1.6	.24
Gender	−.10	.07	−.02	−1.3	
Maori ethnicity	.08	.11	−.01	.74	
Pacific ethnicity	.49	.10	.08	4.7***	
Asian ethnicity	.26	.10	.04	2.5	
Other ethnicity	.25	.15	.02	1.6	
School SES	.09	.07	.02	1.2	
Film exposure	.01	.00	.03	1.7	
Smoking prevalence	.12	.01	.28	11.5***	
Imagery pervasiveness	.00	.01	−.00	−.03	
Nonchalance	−.01	.01	−.02	−1.4	
Positive stereotypes	.10	.01	.12	7.2***	
Judgment	.10	.00	.25	12.2***	

Note: Higher score for female, age level and higher SES.
* $p < .05$, ** $p < .01$, *** $p < .001$.

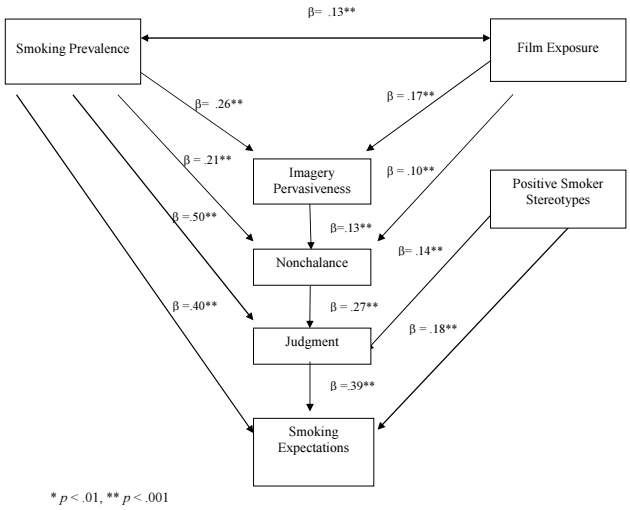

Fig. 2. Obtained Model.

Positive smoker stereotypes

Although the media interpretation model does not predict that positive smoking stereotypes are influenced by any of the film experience or smoking beliefs variables, a regression analysis was conducted to determine whether they were predicted by either film exposure or perceived smoking prevalence (i.e., the two variables that occur at a prior level in the path model). Neither film exposure nor smoking prevalence independently predicted positive smoking stereotypes.

Judgment

Consistent with the media interpretation model, the multiple regression analysis of judgment (Table 3) revealed that smoking prevalence, positive smoker stereotypes, and nonchalance were independently associated with more tolerant judgments of smoking. Unexpectedly, imagery pervasiveness was directly and negatively associated with judgment when controlling for the other attitudinal and demographic variables.

Smoking expectations

The multiple regression analysis regressed smoking expectations on all of the other film experience and smoking belief variables, in addition to the demographic variables (Table 3). Consistent with the media interpretation model, both smoking prevalence and judgment were directly associated with higher smoking expectations. Contrary to predictions, positive smoker stereotypes also predicted high smoking expectations. Film exposure, imagery pervasiveness, and nonchalance were not directly associated with smoking expectations.

Final path model

Multiple regression analyses were conducted to generate the final path coefficients in the revised model (Figure 2). After controlling for the covariates (gender, age level, ethnicity, and school decile rank), the media interpretation model reveals that positive smoker stereotypes ($R^2 = .07$), judgment, and smoking prevalence account for an additional 17% of the variance in smoking expectations. This final set of regression analyses were re-run using only the smokers in the sample. The final path model was equivalent to that depicted in Figure 2, and it accounted for 13% of the variance in smoking expectations. When the analyses were run with the two age groups separately, the results indicated that the model was equivalent in terms of the statistical significance of the paths, but it was marginally stronger for the Year 12 students ($R^2 = .26$) compared with the Year 8 students ($R^2 = .19$).

Mediational analyses

The path model hypothesized that the association between film exposure and nonchalance would be mediated by imagery pervasiveness. Hierarchical regression analyses were conducted to assess the mediational effect of imagery pervasiveness on the relationship between film exposure and nonchalance. The mediational assessments revealed that the reduction in the beta weight for the direct effect of film exposure on nonchalance was not significant. Both film exposure and imagery pervasiveness were identified as having a direct relationship with nonchalance (Table 4).

Further analyses were conducted to assess the mediational effects of nonchalance on the relationship between smoking prevalence and judgment. Results failed to reveal a significant mediational effect, rather, both predictor variables were found to have a significant direct effect on judgment (Table 5). Consistent with the proposed relationships in the final model, smoking prevalence, positive stereotypes, and judgment were all directly associated with smoking expectations. In addition, positive smoker stereotypes also revealed a moderate direct association with smoking expectations (Table 6).

Further analyses were conducted to assess the mediational effects of smoking prevalence and judgment on smoking expectations. The mediational effects of judgment on the relationship between smoking prevalence and smoking expectations indicate that both smoking prevalence and judgment had strong direct effects on smoking expectations (Table 7). Given the reduction in the beta weighting for judgment, there is partial evidence of a mediated effect in the relationship among smoking prevalence, judgment, and

Table 4
Tests for direct and mediational effects of smoking prevalence and imagery pervasiveness on nonchalance

Predictor	Criterion	Beta	p
Smoking prevalence	Nonchalance	.20	$p < 0.001$
Imagery pervasiveness	Nonchalance	.14	$p < 0.001$
Smoking prevalence	Nonchalance	.18	$p < 0.001$
Imagery pervasiveness	Nonchalance	.09	$p < 0.001$

Table 5
Tests for direct and mediational effects of smoking prevalence and nonchalance on judgment

Predictor	Criterion	Beta	p
Smoking prevalence	Judgment	.50	$p < 0.001$
Nonchalance	Judgment	.38	$p < 0.001$
Smoking prevalence	Judgment	.46	$p < 0.001$
Nonchalance	Judgment	.17	$p < 0.001$

Table 7
Tests for direct and mediational effects of judgment on the relationship between smoking prevalence, and smoking expectations

Predictor	Criterion	Beta	p
Smoking prevalence	Smoking expectations	.40	$p < 0.001$
Judgment	Smoking expectations	.39	$p < 0.001$
Smoking prevalence	Smoking expectations	.27	$p < 0.001$
Judgment	Smoking expectations	.25	$p < 0.001$

smoking expectations. Additional analyses tested the mediational effects of judgment on the relationship between positive stereotypes and smoking expectations (Table 6). The results indicate that both positive stereotypes and judgment have a strong direct effect on smoking expectations.

Discussion

The primary aim of the study was to develop and assess a theoretical model of film exposure, media interpretation, and ambivalence measures on smoking expectations for the future. Hierarchical regression analyses revealed several significant direct and indirect associations among film exposure, media interpretation, and ambivalence measures. Path analysis was used as a procedure to test the contribution of media exposure and interpretation variables on smoking attitudes and norms [38,39]. Limitations of the study include the fact that the alpha coefficients for several measures were low (including film exposure, imagery pervasiveness, and nonchalance). The absence of strong internal consistency in film exposure and imagery pervasiveness may be partially attributed to the variation in film genre nominated. Moreover, film exposure was measured by perceived frequency of viewing films, as opposed to specific viewing exposure. The low alphas may also have been partially responsible for the fit of the media interpretation model; that is, if stronger internal consistency was achieved within several measures, the proportion of variance accounted for by the model may have been higher [40]. However, the strengths of the study design can be attributed to the high external validity and a high response rate.

Overall, the model accounted for 24% of the variance in smoking expectations within the total sample. It was evident that perceptions that smoking is prevalent, a nonjudgmental attitude toward smoking, and positive smoker stereotypes independently accounted for a significant proportion of the variance within smoking expectations. The media interpretation model held consistently for both smokers and nonsmokers as well as for both younger and older adolescents, suggesting that there are comparable patterns of interpretations and relevance of smoking imagery and tobacco use among these groups. The findings suggest that the media interpretation model extends general cognitive models of behavior intention through the inclusion and prioritization of media as an influential interpretative dimension of adolescents' everyday lives. Findings from this study extend research already published indicating that adolescents' interpretations of media images reflect pre-existing beliefs about smoking, which are derived from both real-life experiences and film representations of tobacco use [5,6]. This finding is also consistent with recent work by Sargent et al. suggesting that tobacco use in film plays an important role in representing smoking as a socially desirable and normative behavior, which is associated with smoking susceptibility [7]. The present study suggests that smoking imagery in film is instrumental in contributing to ambivalent attitudes toward tobacco use and smoking intentions.

Table 6
Tests for direct and mediational effects of judgment on the relationship between positive stereotypes and smoking expectations

Predictor	Criterion	Beta	p
Positive stereotypes	Smoking expectations	.18	$p < 0.001$
Judgment	Smoking expectations	.39	$p < 0.001$
Positive stereotypes	Smoking expectations	.13	$p < 0.001$
Judgment	Smoking expectations	.37	$p < 0.001$

To date, few studies have explored how film images are operationalized within the matrix of other predictors to smoking uptake [7,9]. Although continued work is necessary to further unravel the relationship between film images of tobacco and smoking intentions, this study assesses the relationship among beliefs about tobacco use, film representations of smokers, and smokers' intentions. Consistent with previous studies, the present findings suggest a primary mechanism of effect for positive smoker stereotypes is the representation of cigarette smoking as a socially sanctioned behavior that is familiar, expected, and socially desirable.

Film exposure, imagery pervasiveness, and smoking prevalence were found to be directly associated with a nonchalant attitude toward smoking imagery in film. This finding affirms speculation that inflated estimates about the normalcy of smoking are associated with a nonchalant attitude toward smoking in film [6]. Perceived prevalence of smoking among peers and others (and, consequently, the "false consensus effect") may therefore be an important indicator of the acceptance of, or negotiation with, smoking images in film. Similarly, previous work revealed that the pervasive presence of tobacco imagery in film may be perceived as an accurate representation of a "normal" and

culturally appropriate behavior (e.g., in response to stress or boredom) [6–9]. Moreover, it is likely that "realistic" images are perceived to be implicitly credible in that they cooperate with pre-existing expectations of tobacco use and are therefore less likely to be challenged [20].

Identification of positive smoker stereotypes was directly associated with nonjudgmental attitudes about smoking. Positive stereotypes are not representative of the entire spectrum of imagery and are not necessarily interpreted favorably by all adolescents [11]. However, positive images may present a generic, film-specific image of smoking [2,6]. Adolescents who readily accept not only the pervasiveness of smoking imagery but also the stylized depictions of tobacco use in film, images that are patently constructed to achieve a desired impact, appear to be particularly prone to having nonjudgmental attitudes toward smokers.

Nonchalance toward smoking imagery in film, and a nonjudgmental attitude toward smokers in general are critical issues that emerge from, and potentially underpin, adolescents' interpretation of smoking imagery. To date the relevance of nonchalance as a predictor of smoking intentions has received little attention. Our qualitative studies identified that adolescents who expressed either a nonchalant or ambivalent response to smoking imagery in film were more likely to be nonjudgmental of smokers in general [5,6]. Theoretically, ambivalence, as a response to pervasive tobacco imagery, emerges when experiential knowledge of the perceived positive aspects of smoking (as a relaxant, or something to do) operates in tension with the "scripted" understanding that smoking is harmful. Therefore, adolescents may regard smoking as a (risky) personal choice and yet simultaneously express personal ambivalence toward its use, both in film and real life. Smoking imagery in film can effectively challenge pre-existing understandings about the reality of tobacco use (as experienced first-hand, or observed by proxy), and inform knowledge of the prevalence of smoking. Sargent and colleagues found that smoking images in film did not influence normative beliefs about peers smoking, but it altered perception of the normalcy of adult smoking [7]. This is consistent with the over-representation of adult smokers in film compared with adolescent smokers [1,7].

It is unclear whether perceptions of smoking in real life enhance an awareness of smoking in film, or whether smoking images inflate the perception that smoking is common in reality. However, it is speculated that given the greater visibility of smoking in the everyday context, perceptions of normative smoking behavior are derived in part from an adolescent's socio-cultural environment and reinforced and recreated variously on screen. However, a longitudinal, prospective study design is necessary to effectively investigate these issues.

Although general cognitive models, such as the Theory of Reasoned Action, offer a useful framework for understanding patterns of behavioral intention, environmental dimensions such as media exposure and appraisals of media images are undermined [16]. In addition, the media interpretation model proposes that attitudes are mediated by exposure to film, which contribute to the perception of smoking prevalence, permissiveness toward smokers and smoking imagery, and enhances smoking intention. In effect, the media interpretation model has extended current understandings about the relationships among social-cognitive variables such as perception of smoking prevalence, judgment of smokers, and media analysis variable on smoking expectations.

The path analytic model allows an assessment of the mediated pathways of effect to be identified among smoking norms, attitude toward smokers, and film exposure and interpretation measures [37]. In essence, the media interpretation model enabled an assessment of the role of media specific constructs, which operate alongside and independent to smoking norms and expectations. Of all the media constructs included in the model, positive interpretations of smokers in film was significantly and directly associated with smoking expectations.

Previous research suggests that film texts play a critical role in the shaping and reiteration of cultural identities and expectations in relationships between the viewer and film imagery and film stars' behaviors [5,6,9]. The media interpretation model highlights the importance of assessing the various factors that influence interpretations of smoking imagery, in particular, socio-cultural factors such as perceptions of smoking norms, attitudes toward tobacco use in general, and positive appraisals of smoking imagery. From these analyses it is evident that smoking images as presented in film play a role in the development of smoking intentions, possibly through the mechanism of inflating smoking prevalence and presenting socially attractive images that keep the desirability of tobacco alive in a climate of unpopularity.

Adolescents and young people are highly media-savvy and have been found to respond negatively to patently "youth oriented" anti-smoking intervention, which overtly seeks to gain their support [40]. Accordingly, future research should address the development of an intervention, which credits adolescents with the skills and cultural competence to question the motivation behind "incidental" tobacco representations in film, and in other popular media. Future research into young people's perceptions of smoking imagery in film should therefore address how the attainment of knowledge about media constructions (including product placement) may be useful in mitigating or deflating the appeal of smoking imagery. Moreover, this knowledge may also be critical to assist young people to develop a more accurate assessment of the distorted representation of tobacco in film.

Acknowledgements

We acknowledge the National Heart Foundation of New Zealand for the support of this research. We are especially

grateful for the administration assistance offered by school staff members. This study would not have been possible without the generosity of the students who participated in this research.

References

[1] Hazan AR, Lipton HL, Glantz SA. Popular films do not reflect current tobacco use. Am J Public Health 1994;84(6):998–1000.
[2] Stockwell T, Glantz S. Tobacco use is increasing in popular films. Tob Control 1999;6:282–4.
[3] Sargent J, Tickle J, Beach M, et al. Brand appearances in contemporary cinema film and contribution to globalization of cigarettes. Lancet 2001;357:29–32.
[4] Gray D, Amos A, Currie C. Exploring young people's perceptions of smoking images in youth magazines. Health Educ Res 1996;11(2): 215–30.
[5] McCool J, Cameron L, Petrie K. Adolescent perceptions of smoking imagery in film. Soc Sci Med 2001;52(10):1577–87.
[6] McCool J, Cameron L, Petrie K. Interpretations of smoking imagery by older teenagers. Soc Sci Med 2003;56(5):1023–32.
[7] Sargent J, Dalton M, Beach M, et al. Viewing tobacco use in movies: does it shape attitudes that mediate adolescent smoking? Am J Prev Med 2002;22(3):137–45.
[8] McIntosh W, Bazzini D, Smith S, Wayne S. Who smokes in Hollywood? Characteristics of smokers in popular films from 1940 to 1989. Addict Behav 1998;23(3):395–8.
[9] Pechmann C, Shih C. Smoking scenes in movies and antismoking advertisements before movies: effects on youth. J Mark 1999;63(3): 1–13.
[10] Tickle J, Sargent J, Dalton M, et al. Favorite movie stars, their tobacco use in contemporary movies, and its association with adolescent smoking. Tob Control 2001;10:16–22.
[11] Amos A, Currie C, Gray D, Elton R. Perception of fashion images from youth magazines: does a cigarette make a difference? Health Educ Res 1998;13(4):491–501.
[12] Distefan J, Gilpin E, Sargent J, Pierce J. Do movie stars encourage adolescents to start smoking? Evidence from California. Prev Med 1999; 28(1):1–11.
[13] Chassin L, Presson C, Sherman S, Edwards D. The natural history of cigarette smoking: predicting young-adult smoking outcomes from adolescent smoking patterns. Health Psychol 1990;9(6):701–16.
[14] Sommer C. Social representations and media communications. In Flick ed. U The Psychology of the Social. Cambridge, UK: Cambridge University Press, 1998;186–95.
[15] Tullock T, Lupton D. Television, AIDS and risk: a cultural studies approach to health communications. In: Tullock J, Threadgold T: (eds). Australian Cultural Studies. St. Leonards, NSW: Allen & Unwin, 1997;3–25.
[16] Ajzen I, Fishbein M. The prediction of behaviour from attitudinal and normative variables. J Exp Soc Psychol 1970;6:466–87.
[17] Ajzen I, Fishbein M. Understanding Attitudes and Predicting Social Behaviour. Englewood Cliffs, NJ: Prentice-Hall, 1980.
[18] Bandura A. Social Learning Theory. Englewood Cliffs, NJ: Prentice Hall, 1977.
[19] Moscovici S. The phenomenon of social representations. In: Farr R, Moscovici S (eds). Social Representations. Cambridge, UK: Cambridge University Press, 1983:55–8.
[20] Chassin L, Presson C, Sherman S, et al. Self-images and cigarette smoking in adolescence. Pers Soc Psychol Bull 1981;7(4):670–7.
[21] Morgenstern S. The epistemic autonomy of mass media audiences. Crit Stud Mass Commun 1992;9:293–310.
[22] Amos A, Gray D, Currie C, Elton R. Healthy or druggy? Self-image, ideal image and smoking behavior among young people. Soc Sci Med 1997;45(6):847–58.
[23] Signorielli N, Morgan M. Introduction. In: Signorielli N, Morgan M. eds. Cultivation Analysis: New Dimensions in Media Effects Research. Newbury Park, CA: Sage, 1990:9–33.
[24] Iannotti R, Bush P, Weinfurt K. Perceptions of friends' use of alcohol, cigarettes, and marijuana among urban schoolchildren: a longitudinal analysis. Addict Behav 1996;21(5):615–32.
[25] Chassin L, Presson C, Sherman S, et al. Predicting the onset of cigarette smoking in adolescents: a longitudinal study. J Appl Soc Psychol 1984;14(3):224–43.
[26] Collins K, Hill D. Psychosocial predictors of young adolescent cigarette smoking: a sixteen month, three wave longitudinal study. J Appl Soc Psychol 1992;17:554–73.
[27] Michell L. Loud, sad or bad: young people's perceptions of peer groups and smoking. Health Educ Res 1997;12(1):1–14.
[28] Gibson B, Maurer J. Cigarette smoking in the movies: the influence of product placement on attitudes toward smoking and smokers. J Appl Soc Psychol 2000;30(7):1457–73.
[29] Dusenbury L, Kerner J, Baker E, et al. Predictors of smoking prevalence among New York Latino youth. Am J Public Health 1992; 82(1):55–8.
[30] Jackson C. Cognitive susceptibility to smoking and initiation of smoking during childhood. Am J Prev Med 1997;13:385–91.
[31] Pierce J, Choi W, Gilpin E, et al. Validation of susceptibility as a predictor of which adolescents take up smoking in the United States. Health Psychol 1996;15(5):355–61.
[32] Wang M, Fitzhugh E, Green B, et al. Prospective social-psychological factors of adolescent smoking progression. J Adolesc Health 1999;24(1):2–9.
[33] Laugesen M, Scragg R. Trends in cigarette smoking in fourth-form students in New Zealand, 1992–1997. N Z Med J 1999;112(1094): 308–11.
[34] Roberts, D. Media and youth: access, exposure and privatization. J Adolesc Health 2000;27(2 Suppl):8–14.
[35] Robinson L, Klesges R. Ethnic and gender differences in risk factors for smoking onset. Health Psychol 1997;16(6):499–505.
[36] New Zealand Census 2001. Statistics New Zealand/Te Tare Tatau, Wellington, New Zealand, http://www.stats.govt.nz. Accessed July 3, 2003.
[37] Baron R, Kenny D. The moderator-mediator variable distinction in social psychological research: conceptual, strategic and statistical considerations. J Pers Soc Psychol 1986;51(6):1173–82.
[38] Darnall B, Smith J, Craighead L, Lamounier J. Modification of the cognitive model of bulimia via path analysis on a Brazilian adolescent sample. Addict Behav 1999;24(1):47–57.
[39] Kohler C, Fish L, Greene P. The relationship of perceived self-efficacy to quality of life in chronic obstructive pulmonary disease. Health Psychol 2002;21(6):610–4.
[40] Hill D. Why we should tackle adult smoking first. Tob Control 1999;8:333–5.