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The perceptions of male and female Western Australian adolescents in relation to body image and smoking

Mary Edwards
Edith Cowan University

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The Perceptions of Male and Female Western Australian Adolescents in
Relation to Body Image and Smoking

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Mary Edwards

A Report Submitted in Partial Fulfilment of the
Requirements for the Award of
Bachelor of Arts (Psychology) Honours
Faculty of Community Studies, Education and Social Sciences
Edith Cowan University

13th November 2000

Statement

I declare that this written assignment is my own work and does not include:

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The Perceptions of Male and Female Western Australian Adolescents in Relation to Body Image and Smoking

Abstract

Although the numbers of adult smokers has declined, numbers of adolescent smokers have not, with females outnumbering males. Research has indicated that adolescent females have higher levels of body image dissatisfaction than males. This dissatisfaction is mostly with regard to weight, which suggests a possible association between female adolescents smoking and weight control.

A study of American adolescents (Camp, Klesges & Relyea, 1993) found that adolescent females were more likely to perceive that smoking is a method of weight control and to use smoking to control their weight than adolescent males.

This present study investigated the perceptions of 625 Western Australian adolescents (321 males and 304 females) in the age range 13-17 years with regards to smoking and weight control. The study was a partial replication of Camp et al. (1993).

Data were collected by way of a self-completed questionnaire based on the format used by Camp et al.

Findings were not wholly consistent with Camp et al. There was a belief amongst the participants that smoking was a method of weight control, but this was not gender specific. Experimental smokers were significantly more likely than never or regular smokers to endorse the belief. The belief in smoking as a method of weight control reliably predicted regular smoking.

Regular smokers of either gender that were classed as restricted eaters were more likely to smoke for weight control, than those who were not restricted eaters.

In summary, there was a higher likelihood of being a regular smoker as opposed to a nonsmoker if the individual was an older female, believed that smoking controlled weight, had friends and or family members that smoked, positively evaluated the image of smokers, and was characterised as a risktaker or rebel. There was a higher likelihood of being a regular smoker as opposed to an experimental smoker if the individual was female, had friends and or family members that smoked, positively evaluated the image of smokers and was characterised as a risktaker or rebel.

Implications for health educators may include the need to address the perception of smoking as a weight control method, especially amongst experimental smokers.

Author: Mary Edwards
Supervisor: Alison Salmon
Co-supervisor: Dr. Lynne Cohen
Submitted: 13th November, 2000

Declaration

I certify that this thesis does not, to the best of my knowledge and belief:

- (i) incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;
- (ii) contain any material previously published or written by another person except where due reference is made in the text: or
- (iii) contain any defamatory material.

Signature: _____

Date: 13.11.2000

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Figure 1

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Schematic Representation of the Theory of Reasoned Action

Introduction

The use of tobacco amongst people around the world has a long history (Gossop, 1996). It was first brought to the Western world by early explorers such as Christopher Columbus in the 15th century (Gossop, 1996) and to Australia around 1788 (McAllister, Moore & Makkai, 1995). Even though there had been concerns of the harmful consequences of tobacco as far back as the 16th century (Gossop, 1996), it was not until 1964 that the U.S. Surgeon General (on the basis of research evidence collected during 1950's and 60's) declared cigarette smoking to be hazardous to health (McAllister et al. 1995).

The most widely used form of tobacco use is cigarette smoking, which has been found to be associated with many adverse health consequences, including cancers of the lung and oesophagus, respiratory diseases such as emphysema, and cardio vascular disease (Australian Institute of Health and Welfare, AIHW, 1999). It is not only smokers that are susceptible to the effects of smoking, non-smokers may also have their health adversely affected by cigarette smoke. For example, passive inhalation of other peoples smoke has been linked to illnesses (Hackshaw, Law, & Wald, 1997) and to low birthweights amongst babies (Conter, Cortinovic, Rogari & Riva, 1995). In Australia in 1997, there were 150,000 hospitalisations and 18,000 deaths attributed to tobacco use (AIHW, 1999). Even though the detrimental health effects of smoking have been well publicised via educational and media campaigns, including health warnings on each packet of cigarettes, 26% of the Australian population still smoke (AIHW, 1999).

The rates of adult Australians smoking have declined from 37% in 1977 (Department of Human Services and Health, 1994) to 26% in 1998 (AIHW, 1999), although figures for adolescents (age range 14-19) have remained constant at approximately 25% (AIHW, 1999). This equates to around 400,000 adolescents (205,000 females and 194,600 males) smoking on average 59 cigarettes per week (AIHW, 1999).

Prior to the age of 13 years the numbers of males smoking is higher than that of females. However, this trend reverses as adolescents get older with higher rates of smoking amongst females than males in the 14-19 year age range (Byrne, Byrne, & Reinhart, 1993). Previous research indicates that individuals who begin smoking in adolescence tend to continue smoking into adulthood. In addition there is the potential for higher rates of smoking related disease amongst adult females than at present (McAllister et al. 1995).

Smoking and Adolescence

There are many explanations for the onset of substance use in adolescence including: social learning theories, conventional commitment and social attachment theories, and cognitive affective theories (Petraitis, Flay & Miller, 1995).

Social Learning Theories

Social learning theories of adolescent substance use are based on the assumption that adolescent's beliefs and expectations of substance use are influenced by their environment. They learn about substance use by observing the attitudes and behaviours of people in their environment such as friends, role models, and parents

(Petraitis et al. 1995). If an adolescent is surrounded by people that endorse the benefits of smoking (whether overtly or inadvertently) they are more likely to adopt positive attitudes and beliefs towards smoking (Petraitis et al.). Although the presence of smoking models has been found to be a predictor of smoking amongst adolescents (Byrne et al. 1993), according to Petraitis et al. Social Learning Theory does not explain the attraction to the adolescent of peers or role models that smoke. Rather than merely emulating the smoking behaviour of smoking models, the adolescent may believe that by smoking they can take on a social identity similar to those persons they admire. For example, in a study of 13-17 year olds, Byrne and Reinhart (1998) found that boys who believed that other boys who smoked were socially popular, were themselves more likely to become smokers.

Conventional Commitment and Social Attachment Theories

These theories of substance use assume that some adolescents have a greater emotional attachment to their peers than their families (Petraitis et al. 1995). According to these theories, this type of adolescent is more likely to use substances if their peers are substance users. As these adolescents have less commitment to society or their family than other adolescents, they adopt or conform to the values and rules of the peer group rather than those of society and their family. Although there is some support for these theories, e.g., rebelliousness has been shown to be a predictor of smoking onset amongst adolescents (Camp, Klesges & Relyea, 1993), they do not take into account the adolescents own beliefs and expectations surrounding the specific substance.

Cognitive Affective Theories

Cognitive affective theories (Petraitis et al. 1995) of adolescent substance use do consider the adolescent's beliefs and expectations of the substance and substance use. These beliefs and expectations are assumed to be major contributing factors in adolescent substance use. According to these theories, peers, family and personality have a secondary influence on the decision to use a specific substance (Petraitis et al.). For example, an adolescent that holds negative beliefs and expectations about cigarette smoking is unlikely to begin smoking even if they have family or friends that smoke. Research by Ungar (2000) cited case studies of adolescents at high risk of problem behaviours. He reported that a female adolescent who was part of a peer group that used alcohol stated that she had chosen not to consume alcohol because she had witnessed the impact of alcohol on her family.

Petraitis et al. (1995) commented that due to the complex nature of adolescent substance use it is difficult for one theory to provide a full explanation. However, a cognitive affective theory, the Theory of Reasoned Action, has been used to explain and predict adolescent substance use (Petraitis et al.).

Theory of Reasoned Action

The Theory of Reasoned Action was proposed by Ajzen and Fishbein in 1980 as a model of general behaviour and has been applied to many different behaviours, such as use of birth control pills, smoking marijuana and voting preference in elections (Ajzen, 1985). According to the Theory of Reasoned Action (TRA), before an action is performed there must be a specific intention to perform the action. This intention is subject to two influences, personal attitudes and beliefs towards the

behaviour, and the social influence of others toward the behaviour (Ajzen, 1985)

This is illustrated in figure 1.

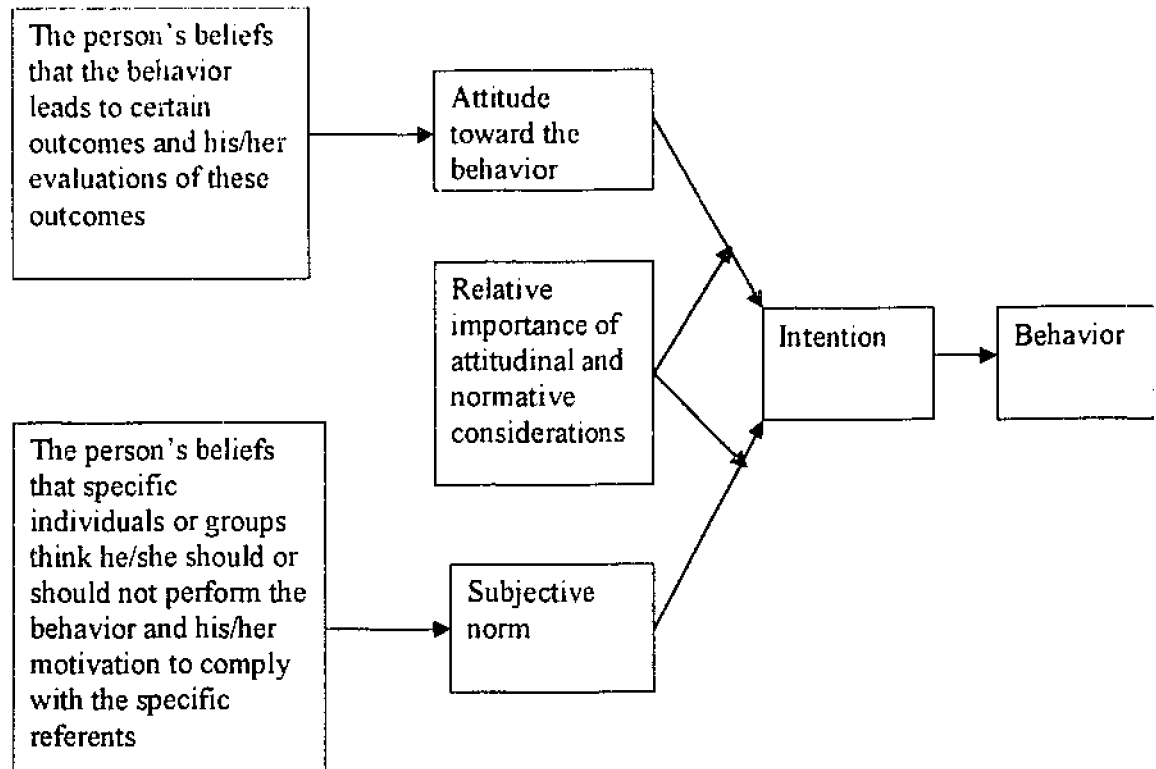


Figure 1. Schematic representation of the Theory of Reasoned Action (cited in Sutton, 1989, p. 292).

According to Ajzen (1985, p. 12) “Generally speaking, people intend to perform a behaviour when they evaluate it positively and when they believe that important others think they should perform it”. In relation to cigarette smoking, people are more likely to form an intention to smoke if they hold positive attitudes and beliefs about smoking and believe that others think they should smoke.

The Theory of Reasoned Action has been applied to the study of smoking behaviour. For example, Newman, Martin, and Irwin (1982) applied TRA to an

investigation of attitudinal and normative factors associated with smoking amongst 95 Australian and 95 American adolescents. Adolescents were required to complete a questionnaire. The questionnaire comprised:

- 17 'belief about the behaviour' items, e.g., smoking cigarettes helps you feel grown up, ... (Likely - Unlikely),
- 17 'evaluation of the consequences' items, e.g., consequences for me: feeling grown up is, ... (Good-Bad),
- 6 'normative belief' items, e.g., my mother thinks I ... (Should-Should Not ... smoke cigarettes)
- 6 'motivation to comply' items, e.g., In general I, ... (Do Not Want To -Want To ...do what my mother thinks I should do).

They reported a significant difference between smokers and non-smokers for 'belief about the behaviour' component of attitude indicating that smokers and non smokers differed in their beliefs about smoking. They also reported that three items on the 'normative belief' scale (i.e., whether others think they should or should not smoke) separated smokers from nonsmokers (Newman et al. 1982). However, although the attitude component of the model was significant, the coefficients for the subjective norms were not, suggesting that intention to smoke was influenced more by attitudes than subjective norms. Notwithstanding this finding, they concluded that the model was useful as a predictor of behavioural intention and had the ability to provide insight to educational program planners of the areas in which non-smokers and smokers differed.

A study by Banwell and Young (1993) provided some qualitative evidence for TRA. From focus group discussions with female adolescent smokers and non-

smokers, they reported that some female adolescents (nonsmokers) had a positive image of smokers, describing smokers as 'cool', 'sexy' and 'tough' (p 379), while smokers reported that image was of no concern to them. Although Banwell and Young did comment that there were inconsistencies with the claims of the smokers, because when discussing novice smokers the smokers claimed they were able to identify novice smokers by their appearance and behaviour, which suggested that smokers were aware of images associated with smoking. The smokers reported that "they commenced (smoking) with the encouragement of their friends or by emulating their older siblings, usually sisters who were more experienced smokers"(Banwell & Young, 1993, p.379). These young smokers held expectations that smoking would enhance their social identity and believed that, significant others in their environment thought that they should smoke. A positive evaluation of smokers amongst male adolescents was reported by Byrne and Reinhart (1998). They reported that male adolescents that believed smoking amongst males was associated with social popularity were more likely to have become smokers between the initial study and the follow up period.

A study by Lawson (1994) of pregnant adolescents provided further evidence for TRA as applied to smoking. Lawson interviewed 20 pregnant adolescents between the ages of 16 and 18 years. Results indicated that these adolescents held beliefs that smoking during pregnancy would lead to a smaller baby and therefore to a less painful and prolonged labour and delivery. These beliefs were based on the experiences of relatives or friends that had continued to smoke during pregnancy and had small babies. The decision to smoke was based on these positive beliefs about smoking, their friends or relatives endorsed these beliefs and along with the expected

outcome of a smaller baby and less painful delivery, the intention to smoke was formed.

The above examples indicate that the adolescent makes a decision to smoke on the basis of beliefs and expectations of smoking. Therefore the adolescent that views adolescent smokers as “cool”, believes that it is the cigarette smoking that confers the image of ‘coolness’ on the smoking adolescent. The adolescent then believes and expects that the same image of ‘coolness’ will be conferred on him/her should he/she smoke.

Although TRA has been used as a predictive model of health behaviours, it has been criticised by researchers. For example, O’Connor and Saunders (1992) have questioned whether the attitudes that are measured are actually attitudes or prior intentions. They have also commented on the relationship between intention and behaviour. While these concerns may have some legitimacy with regards to other substance use, they may not hold in the case of smoking. For example, research has shown that an expectation that one will smoke in the future (intention) has been shown to be a predictor of actual smoking behaviour (Byrne & Reinhart, 1998).

Another comment raised by Gibbons, Gerrard, Blanton, and Russell (1998) suggested that rational-based theories (that is theories that assume rational decision making such as TRA) are not effective predictors of health-impairing behaviours, especially adolescent risk-behaviour. They suggest that much of adolescent risk behaviour is unplanned and not rationally or logically thought through. However, concepts of rationality and logic are difficult to describe objectively, what is rational to one person may be irrational to another. For example, the adolescent that binge drinks on the week-end may be behaving in a rational and logical way from their

own viewpoint. The adolescent is behaving in a goal-oriented manner if the goal is to become intoxicated (i.e., get drunk), the behaviour to be engaged in to obtain that goal is drinking excessively in a short amount of time regardless of health and other risks.

The pregnant adolescents in Lawson's (1994) study provided another example of decision making that may be seen as irrational to observers, but rational to the decision makers. To many observers it may appear illogical and dangerous that someone should continue to smoke while pregnant (especially because of the added dangers from smoking to the foetus). Yet to the adolescents in the study this seemed a rational and logical decision. Lawson states that their friends or relatives had delivered seemingly healthy babies, their intention was to minimise the pain and discomfort of childbirth and in their minds this could be achieved by ensuring they delivered a small baby.

TRA may offer a useful explanation of cigarette smoking in adolescence as it takes account of the adolescents' beliefs and expectations regarding smoking. While other theories have their focus on different factors such as modelling, learning or social influences, TRA attributes the biggest influence in smoking to be the individual's own beliefs and expectations of what smoking will do for them. TRA does not disregard other factors influencing the decision of the adolescent but these other factors are of less importance in the final decision.

For example, Fishbein (cited in Sutton, 1989, p. 295) applied the model to the study of a comparison of the behavioural beliefs and evaluations of possible outcomes of smoking amongst American college women. The women were divided into two groups, those whose intention to smoke was stronger than their intention not

to smoke (intenders) and those whose intention not to smoke was stronger than their intention to smoke (non-intenders). They were required to rate eight negative and eight positive outcomes of smoking e.g., negative outcomes included “harmful to health, increase cancer, offensive to others” and positive outcomes included “relieves tension, keeps weight down, helps concentrate”.

Fishbein found no significant differences between intenders and nonintenders when evaluating the positive outcomes of smoking, but significant differences in the evaluation of six of the eight negative outcomes, (i.e., “harmful to health, increase cancer, breathing problems, offensive to others, bad odor on clothes, and increase dependency”). Intenders rated negative outcomes less negatively than nonintenders (i.e., those intending to smoke rated negative outcomes as more positive than those not intending to smoke).

With regards to behavioural beliefs about smoking, Fishbein found that both groups believed the negative outcomes were possible if they smoked, although there was a significant difference between the groups with intenders holding a weaker belief. Interestingly, Fishbein found that intenders believed that smoking would lead to more positive outcomes, while nonintenders believed not smoking would lead to more positive outcomes. For example, intenders believed that smoking would be associated with the positive outcomes of “relieves tension, relaxing, helps concentrate” and nonintenders believed these same outcomes would be associated with not smoking for them. These findings provide support for TRA in that the intention to smoke or not to smoke was based on the beliefs and expectations of the women with regard to the possible consequences of smoking.

Beliefs and attitudes towards smoking were also investigated by Wang, Fitzhugh, Cowdery, and Trucks (1995). They surveyed 6,900 male and female adolescents with regards to attitude items such as “seeing someone smoke turns me off” and belief items such as “safe to smoke for only a year or two”. The total survey comprised 230 items. They found that on initial analysis there were no significant gender differences with regards to attitudes and beliefs. As a consequence of this finding subsequent analysis included both genders. They found that adolescent smokers were more likely to hold positive beliefs about smoking, such as smoking reduced stress, relieved boredom and helped individuals relax, than were non-smokers. Smokers also had a more positive attitude toward others smokers than non-smokers, e.g., seeing other smokers did not turn them off. Wang et al. (1995) concluded that attitudes and beliefs about smoking were predictive of adolescents smoking status.

Factors Associated with Smoking

Two large scale studies have been carried out in Australia to determine factors associated with adolescent smoking (Byrne et al. 1993; Byrne & Reinhart, 1998). Research by Byrne et al. (1993) investigated the psychosocial correlates of adolescent smoking amongst 6,579, 13 – 17 year olds from three Australian cities. Adolescents were required to complete comprehensive questionnaires assessing demographic profiles, educational preferences and performance, knowledge of effects of smoking on health and sporting performance, reasons for adolescent smoking, parental, sibling and peer smoking behaviour, personal smoking behaviour, self esteem, neuroticism and vulnerability to peer pressure. There was a 12 month

follow up of the initial research in which those adolescents that could be identified from the first cohort were required to complete a similar questionnaire to the one completed previously.

In the initial study a factor analysis of reasons why adolescents smoke identified four factors: exemplar pressure (e.g., role models that smoke), 22.9% of variance; peer pressure (e.g., all their friends are smoking), 14.9% of variance; family modelling (e.g., copying the adults in their families that smoke), 12.5% of variance; and curiosity, 11.4% of variance. A second factor analysis was conducted to determine factors associated with smoking, health and sports performance. Three factors were identified: recognition of links between smoking, health and sports, (27.2% of variance); concern with personal physical fitness, (18% of variance); and perceived relative bodyweight, (11.4% of variance).

In the follow up study, the following factors were identified as reasons why adolescents smoke: exemplar pressure, peer pressure, family modelling and curiosity. Both studies identified gender differences in reasons why adolescent smoke.

The Role of Peer Pressure

One factor that has emerged in the literature is peer pressure, that is, pressure to smoke exerted by the adolescent's group of friends (Zinser, Kloosterman & Williams, 1992; Fergusson, Lynskey & Horwood, 1995; Byrne et al. 1993). However, recent studies have disputed the impact of peer pressure (Dick, Rose, Viken & Kaprio, 2000; Byrne & Reinhart, 1998). For example, Ungar (2000) stated that peer pressure was a myth and was used by adults to explain adolescent's problem behaviours. He interviewed 41 high risk adolescents (those thought to be at

high risk for mental health problems due to behaviours associated with delinquency) as part of a qualitative study into the relationship between the process of empowerment (i.e., the attainment of personal and social power) and mental health. These interviews were then compared with other data collected from clinical files, family interviews and focus group discussions. He found that adolescents in the study did not report an exerted pressure to conform to their peer group, but the peer group enabled them to develop their own self worth and identity.

Rather than adolescents being pressured by their peers into certain behaviours, some studies have suggested that the adolescent may be predisposed to these behaviours and actively seek like-minded peers, (Fergusson et al. 1995; Ungar, 2000). Byrne and Reinhart (1998) have suggested that the term 'peer pressure' has not been well defined and in some instances two differing concepts have been covered by the one label. They have suggested that what has in the past been defined as peer pressure is composed of two components, one active and one passive. The active component relates to an exerted pressure by a defined peer group. For example, an adolescent takes up smoking in order to become accepted into a specific group. The passive component is associated with a conducive social environment. For example, an adolescent whose friends smoke will meet with no resistance should they take up smoking. Byrne and Reinhart (1998) suggested that having friends that smoke does not necessarily mean that they will actively exert pressure on the non-smoking adolescent to smoke. It may be that having friends that smoke may offer a conducive environment where smoking is an accepted behaviour.

Banwell and Young (1993) reported that although the female adolescents interviewed agreed generally with the concept of peer pressure, few reported peer

pressure being an influence in their decision to smoke. However, Banwell and Young suggested that peer pressure did play a part in the decision to smoke, as the young smokers reported that friends, and in some instances older siblings, had encouraged them to smoke. This apparent contradiction may provide some support for Byrne and Reinhart (1998) suggestions that peer pressure has two components. The adolescents in the Banwell and Young study did not feel they had been pressured into smoking. However, the presence of friends and siblings that smoked and encouraged them to smoke may have provided a conducive environment.

Presence of smoking models

Another factor that has been linked to initiation of adolescent smoking is the presence of smoking models in the adolescents' environment. These may include family members and significant others that smoke (Lloyd & Lucas, cited in Lloyd, Lucas, Holland, McGrellis & Arnold, 1998, p.70; Byrne et al. 1993; Camp et al. 1993). Byrne et al. reported that having a mother that smoked was predictive of the onset of smoking behaviour amongst females (not for males). However, in a 12 month follow up study (Byrne & Reinhart, 1998) where Australian adolescents were required to complete self report questionnaires investigating reasons for smoking, having family members who smoked was not associated with the initiation of adolescent smoking. These results suggest that the presence of smoking family members in the home environment may not be as influential as previously suggested.

Image of smoking

The perceived identity or image portrayed by a smoker may be particularly relevant for adolescents, as adolescence is a time of transition from childhood to adulthood. As the adolescent seeks to construct their own adult social identity they may adopt behaviours that they perceive are associated with that social identity. For example, some adolescents perceive smoking as portraying an image of maturity and independence (Banwell & Young, 1993; Holland, McGrellis & Arnold, cited in Lloyd et al. 1998, p. 121), while others believe that smoking confers a “cool” image (Banwell & Young, 1993; Byrne & Reinhart, 1998).

Experience of smoking

Another factor that is thought to influence future smoking behaviour is the adolescent’s or child’s first experience of smoking a cigarette. If the experience is aversive, they are less likely to smoke in the future, while the individual that enjoys smoking their first cigarette is more likely to repeat the behaviour and smoke again (Dobbs & Marsh, cited in McAllister et al. 1995, p. 83).

This view is not fully supported as there is evidence that some adolescents persist with smoking even though they initially have a negative experience of smoking (Banwell & Young, 1993).

Perceived prevalence of adolescent smokers

Adolescent smokers have a tendency to overestimate the prevalence of smoking amongst other adolescents (Williams & Clarke, 1997). This belief has been found to be a contributing factor in adolescent smoking (Benthin, Slovic & Severson,

1993). The belief that more adolescents are smoking than actually are may lead to the normalisation of smoking behaviour by the adolescent.

Perceived levels of social support

Another factor that has been associated with the onset of adolescent smoking is an adolescent's belief that they have no one within their family or friends to rely on or turn to when they face difficulties (Camp et al. 1993). These adolescents may have low self esteem and lowered expectations of their own academic achievements and successes in general. For example, Byrne et al. (1993) found that low self esteem was associated with smoking onset amongst adolescents. Both male and female adolescent smokers rated their academic performance as lower than non-smokers. According to Camp et al. these adolescents may begin smoking as a way of defining a personal successful image.

Risk-Taking

Finally, rebelliousness and risk-taking may contribute to smoking amongst adolescents. Research has suggested that those adolescents that are characterised as risk takers are more likely to smoke as part of a range of other risky behaviours (Camp et al. 1993).

Gender and smoking

Although the above factors have been associated with initiation of adolescent smoking in general, some research suggests that factors may differ according to gender. For example Byrne et al. (1993) suggested that females were more

influenced by smoking family members (particularly their mothers) than were males, while males were more influenced by teachers that smoked than were females.

The results of the follow up study (Byrne & Reinhart, 1998) indicated that male smoking behaviour was influenced by: (in rank order) intention to smoke in the future; having friends who smoke; not acknowledging the detrimental effects of smoking on fitness levels; smoking role models; the perception that social popularity is assigned to males that smoke; stress associated with perceived irrelevant school activities; and not doing well in their favourite school subject. Female smoking behaviour was influenced by: (in rank order) having friends who smoke; not acknowledging the detrimental effects of smoking on fitness levels; expecting to smoke in the future, smoking role models, high neuroticism and stress associated with family conflict (Byrne & Reinhart, 1998). The finding that future intent to smoke was ranked as the most significant predictor of smoking onset in boys and the third highest predictor for girls suggests that the intention to smoke is formed prior to the performance of the behaviour which lends support to the Theory of Reasoned Action in which the behavioural intention (which is made up of two components, attitude toward the behaviour and subjective norm) is assumed to be the precursor to the actual behaviour.

Banwell and Young (1993) purported that female adolescents adopt stereotypical behaviours of their preferred image of femininity in constructing their own social identity. Society tends to dichotomise females into 'good' or 'bad' women according to their behaviours. The 'good' woman is often portrayed as virginal, law abiding, sweet and dependant, while the 'bad' woman image is often portrayed as sexually promiscuous, law breaking and independent. As Banwell and

Young commented the 'bad' woman image may hold connotations of fun and excitement for some adolescents. The adolescent that identifies with the bad women image may attach great importance to stereotypical behaviours of 'bad' women such as smoking and risktaking and adopt them as part of their own identity construction (Banwell & Young, 1993).

The findings of these studies (Byrne & Reinhart, 1998; Banwell & Young, 1993) have suggested that not only does the level of influence of any particular factor vary according to gender, but it also suggests that smoking may serve a different purpose for males and females.

Research has identified many factors as possible predictors of adolescent smoking, including family members who smoke, peers who smoke, perceived image of smokers, first experience of smoking and perceived prevalence of smoking amongst other adolescents. Research has also shown that the level of influence of any particular factor can vary according to gender. Given this research evidence and considering the findings that approximately one quarter of the Australian adolescent population continue to smoke (AIHW, 1999), the following section summarises the different strategies that have been implemented to address the potential harmful consequences of adolescent smoking.

Strategies Aimed at Reducing Smoking

Strategies have been implemented in Australia at both state and national levels in an effort to reduce the numbers of current smokers and deter young people from taking up smoking. For example, a national media campaign, "Every cigarette is doing you damage" was launched in 1997. This strategy contained advertisements

that graphically portrayed the health dangers of smoking, e.g., images of tar accumulation in the lungs, dissecting a brain from a smoker to reveal a blood clot (National Tobacco Campaign, 1999). Although the campaign targeted 18 – 40 year olds, a survey determined the recall of the content of the advertisements amongst 10 – 17 year olds in South Australia (where a state campaign targeted at adolescents showing short term negative consequences of smoking was operational simultaneously with the national campaign).

The results revealed that adolescents had responded more favourably to, and with better recall of the national than the state campaign. But while the “Every cigarette is doing you damage” advertisements have been credited with reducing the numbers of adult smokers (1.4% decline in the first six months of the campaign) they have had a negligible impact on adolescent smoking rates (National Tobacco Campaign, 1999). Perhaps recollection of an antismoking advertisement does not necessarily equate to a change in smoking behaviour. As Williams and Clarke (1997) indicated, smokers are aware of the health risks of smoking, but many do not perceive these risks to be personally relevant. This finding is supported by other studies which found that knowledge and awareness of the detrimental health effects of smoking does not deter adolescents from smoking (Banwell & Young, 1993; Ogden & Fox, 1994; Lawson, 1994).

Optimistic Bias

Adolescents may also underestimate the likelihood of experiencing health problems related to smoking. This underestimation is known as optimistic bias.

Optimistic bias is a belief that one's likelihood of experiencing health problems is less than that of the average person (Adler, Kegeles & Genero, 1994).

Williams and Clarke (1997) found optimistic bias in beliefs about smoking amongst young adults. When asked about the chances of developing lung cancer, emphysema and heart disease, young smokers rated their own chance of developing these diseases as less than those of the average smoker. Young smokers also rated their own chance of quitting as better than the average smoker. Furthermore, Williams and Clarke showed that although young smokers were as knowledgeable about the health risks of smoking as young non-smokers, they did not perceive themselves to be at risk.

According to Adler et al. (1994, p.241) "Bias appears particularly likely to occur for risks which are seen to be infrequent, with which the individual has had little past experience, and which are perceived to be preventable by actions the person can take". Therefore, unless adolescents can see an immediate detrimental effect of smoking they are unlikely to heed the health warnings. Harmful health effects that may occur in 15 – 20 years time will be of little concern to adolescents at present, as they may believe that they can quit before that damage occurs. To the adolescent that has not yet developed an addiction to smoking, the ability to quit at some stage in the future might be a feasible assumption. As Fischhoff (1994, p.137) pointed out "People who have never suffered a physiological addiction may not be able to imagine what such a loss of control is like". This may be relevant to younger adolescents, as it is unlikely that many of them would have experienced trying to quit, they may not be aware that they are addicted.

The study by Banwell and Young (1993) further illustrated the idea that adolescents do not give high priority to the long-term detrimental health effects of smoking. In their study, both non-smokers and smokers reported having considerable knowledge of the injurious health effects of smoking. However, the non-smokers reasons for not smoking included the image that smoking presented and its smell, rather than the adverse health consequences. The main focus of health concerns of both smokers and non-smokers was in relation to their physical appearance (particularly their weight) and their appeal to boys. As Banwell and Young indicated, they were more concerned with immediate rather than future problems.

Educational and media campaigns have specifically targeted adolescents. For example, in 1996 The Western Australian Health Promotion Foundation, Healthway, produced a media campaign 'Smarter Than Smoking' that highlighted the negative aspects of smoking. This strategy was aimed at 12-16 year olds and comprised two components. Firstly, advertisements showed adolescents discussing the negative aspects of smoking and secondly, the advertisement included an animated talking cigarette implying that smokers were being controlled by the tobacco industry (Clarkson, Donovan, Jamrozik, Sydney-Smith & Frizzell, 1998). Some of these were targeted specifically at either males or females. For example, a male sports person is shown being dropped from the team because smoking has caused his sporting performance to be affected. In another advertisement two females are shown in a wash room with one girl complaining that her friend has a better skin complexion. Her friend states that her skin complexion is good because she doesn't

smoke. Other negative effects included in the advertisements were: lack of money due to the expense of cigarettes; bad breath; and loss of boyfriends.

The campaign was launched in three media waves of 7 weeks, 10 weeks and 10 weeks duration respectively over approximately a two year period (Clarkson et al. 1998). After each media wave secondary school students were surveyed to assess the impact of the campaign. Results showed that 90% of students had seen the advertisements at least once. There was a significant increase of no future intent to smoke among smokers from a baseline of 34% to 44% after the third media wave (Clarkson et al.).

While these findings do indicate some promise for reducing the numbers of young people taking up smoking, it should be noted that these results are based on short-term findings. Many of the negative consequences for females portrayed in the advertisements can be remedied. For example, make up can be used to cover a bad skin complexion (many adolescents that do not smoke may also have skin problems as a consequence of puberty), breath fresheners can disguise bad breath, and the adolescent that has been dumped because she smokes can get a boyfriend that smokes. However, it would not be as easy for the males to improve their sporting performance while continuing to smoke, as smoking impairs sporting performance. Therefore the advertisements aimed at females may not be as successful in reducing the numbers of female smokers as those aimed at males.

While many strategies aimed at reducing smoking rates have included banning advertising of tobacco products, age restrictions on purchase, bans on smoking in many public places, the numbers of adolescents smoking does not show a decline. One possible explanation is that the media campaigns have not addressed all

the relevant factors associated with adolescent smoking. A particular issue that has not been addressed in anti smoking strategies is body image.

Body Image

Body image is the internalised representation that each individual has about their own body (Rosenblum & Lewis, 1999). Corsini, (1994, p. 174) defined body image as “the picture and evaluation of one’s body”. This includes all aspects of the body such as shape, size (weight or height) and it can also refer to the whole body or specific parts. For example, a person may be dissatisfied with their nose or lack of height.

Dissatisfaction of body image in relation to body size has been found in adults, adolescents and even in children as young as seven years old (Kostanski & Gullone, 1999). Studies continue to report that females have a higher rate than males of dissatisfaction and unrealistic perception of their body image in relation to body size (weight) (Tiggemann & Pennington, 1990; Kostanski & Gullone, 1999; Vincent & McCabe, 2000). Some studies have found that females that are dissatisfied with their body image tend to perceive themselves as heavier than their actual weight, they also perceive that males prefer a thinner female body shape than males actually report (Lamb, Jackson, Cassidy & Priest, 1993). Body image dissatisfaction amongst adolescents has been suggested as a factor in the development of eating disorders, such as anorexia nervosa and bulimia nervosa (Hill, Oliver & Rogers, 1992). A study of the beliefs and behaviours of 791 Australian adolescents in relation to body image and food intake, found that 52% of the females and 27% of the males wanted

to lose weight. Statistically of all the participants, only 9 to 15% would be expected to be overweight (Nowak, 1998).

There are gender differences in relation to body image dissatisfaction, males desire a more muscular build whereas females want to reduce weight (Cohn et al. 1987; Nowak, 1998; Middleman, Vazquez & Durant, 1998; O'Dea, & Abraham, 1999). A longitudinal study (Rosenblum & Lewis, 1999) reported that across the ages of 13, 15 and 18 years, females became more dissatisfied with their body image while males became more satisfied with their body image. However, Rosenblum and Lewis indicated that there was equal dissatisfaction experienced by males and females with regards to bodyweight and suggest that this may have resulted because 45% of the males that they studied were actually overweight and 30% of the females were underweight. It is interesting to note that they also commented that males might now be experiencing the pressure for thinness that has usually been associated with females.

Body image dissatisfaction amongst female adolescents may be influenced by the onset of puberty (O'Dea & Abraham, 1999; Tiggemann & Pennington, 1990; Nowak, 1998). Adolescence is a time of great physical change. For females there is an increase in body fat which leads to a curvier shape, which for some may be unwelcome. Some researchers have suggested that this dissatisfaction can lead to unhealthy weight loss behaviours. For example, Field, Carmago, Taylor, Berkey, and Colditz (1999) in a 12 month follow up study investigated 6928, 9-14 year old females that had reported not using laxatives or vomiting to control weight at the time of the original study. They found that 74 of the girls had begun to use these methods within the following twelve months. Results indicated that body image

dissatisfaction (weight and shape), importance of thinness to peers, and wanting to emulate media images of females were predictive of the onset of purging behaviours, where purging was defined as “using laxatives or vomiting at least monthly to control weight”, Field et al. (1999, p.1188). They found that stage of pubertal development rather than age was a better predictor of purging behaviours.

Other methods that have been used by adult females in order to achieve their idealised body image have included substance use such as amphetamines, heroin and tobacco (Broom, 1995). This may indicate that the beliefs and expectations of the substance are important factors in the performance of the behaviour.

A possible link between dissatisfaction with body image and smoking amongst female adolescents with eating disorders, and without eating disorders, was investigated by Wiseman, Turco, Sunday, and Halmi (1998). The clinical sample comprised females classified by the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM IV) as anorexia nervosa-restricting type (those individuals that severely restrict their food intake) and bulimia nervosa (those individuals that binge on food and then intentionally vomit). Eighty two with eating disorders and 411 without eating disorders were required to complete a questionnaire of smoking behaviour and an Eating Disorders Inventory (Garner, Olmsted & Polivy, 1983). Results showed that anorexics did not use smoking to control weight and several factors were suggested to account for this finding. Firstly, anorexics have been characterised as fearing maturity, therefore they may not smoke because of the association with adult behaviour. Secondly, anorexics are usually characterised as being obsessional, highly responsible and conforming, therefore societal antismoking

messages may be more effective. Thirdly, anorexics are usually isolated from their peer group thereby diffusing any peer pressure to smoke.

Results indicated that on the Eating Disorders Inventory subscales 'Drive for Thinness' and 'Body Dissatisfaction', smokers in both groups scored higher than the nonsmokers in their respective groups. Nonsmokers without eating disorders had the lowest scores while eating disordered smokers had the highest scores. Although there were higher numbers of smokers in the non clinical group than in the clinical group, smokers in both groups were typified by concerns over bodyweight and shape (Wiseman et al. 1998).

Smoking and Weight Control

Research by Pinto et al. (1999), Ogden and Fox (1994), and Broom (1995) has provided evidence of the use of smoking as a weight control method amongst adults. Indeed fear of weight gain has often been used as a justification for not quitting smoking (Kirven Weekley, Klesges & Relyea, 1992). While fear of weight gain following smoking cessation may be legitimate (Klesges, Meyers, Klesges & La Vasque, 1989), it is not the case that all smokers are thin or that all ex smokers are overweight. There is some suggestion in the literature that cigarette smoking does have some weight control properties, as research has shown that the body weight of a smoker is on average 3 – 3.5kg less than that of a non-smoker (Klesges et al. 1989). However, a study by Istavan, Cunningham and Garfinkle (1992) found that while smokers generally weighed less than non-smokers or exsmokers, heavy smokers (i.e., two or more packs per day) tended to be moderately or severely overweight.

It has also been suggested that while cigarette smoking may have a weight control effect, the effect does not seem to be apparent in younger smokers (Klesges, Zbikowski, Lando, Haddock, Talcott & Robinson, 1998). For example, Klesges et al. (1998) investigated smoking and body weight by comparing regular smokers to never smokers and experimental smokers. In a large sample of 32,144 male and female military recruits the study found that smoking had a slight (but significant) weight suppressant effect (1kg) on the bodyweight of males. However, for females there were no significant findings of a weight suppressant effect of smoking. A significant finding was that experimental female smokers were heavier than the female non-smokers ($M=58.16$ kilograms, $M=57.45$ kilograms respectively) and overall female smokers were heavier than female nonsmokers (Klesges et al.).

Although the findings from this study suggest almost no weight control effect of smoking on young people Klesges et al. (1998) do acknowledge some limitations of the study in regards to generalising the findings to the general population. For example, the sample were members of the U.S. Airforce which does not enrol individuals that are unhealthy or obese and also body weight was self reported. It should also be noted that out of the sample of 32,144 recruits only 8,232 were females. It is also possible that the differences found between nonsmokers and experimental smokers may be due to misperception of their own body weight by the experimental smokers. For example, if the experimental smokers in the study are dissatisfied with their body image then they may perceive themselves as heavier than their actual weight (Lamb et al. 1993).

Female adolescents, smoking and body image

Many studies (e.g., Rosenblum & Lewis, 1999; Lawson, 1994; Nowak, 1998) have shown a concern of many female adolescents is their body image, particularly their weight. For female adolescents the onset of puberty may heighten this level of dissatisfaction (O'Dea, & Abraham, 1999; Tiggemann & Pennington, 1990; Nowak, 1998). It has also been shown that there may be a general perception that smoking is associated with thinness. Therefore it is possible that some female adolescents perceive smoking cigarettes to be a way of controlling their weight. This perception may have been influenced by peers, media images of smokers and even from their mother.

Vincent and McCabe (2000) found that female adolescents involved in weight loss behaviours were influenced more by their mothers weight loss behaviours than their peers. Research has also shown that female adolescents are influenced by their mothers' smoking behaviour (Byrne et al. 1993; Newman et al. 1982). It may be surmised that a mother that holds a perception of an association between smoking and thinness, may inadvertently foster the same perception in her daughter.

For some adolescents, smoking cigarettes may be seen as a way of controlling their bodysize or weight. Byrne et al. (1993) suggested that one of the factors influencing the future intent of the decision to smoke amongst female adolescents, was the perception of being overweight. In a qualitative study by Lawson (1994), pregnant adolescents reported using smoking as a method of weight control. Research has also shown that individuals classified as restricted eaters (i.e., chronic

dieters that engage in bingeing and dieting) smoke for weight control (Ogden & Fox, 1993; Camp et al. 1993; Pinto et al. 1999).

While most of these studies concern female adolescents, an association has been found between weight concerns and smoking amongst 9-14 year old males and females (Tomeo, Field, Berkey, Colditz & Frazier, 1999). The participants were categorised as precontemplators (not considering smoking), contemplators (considering smoking) and experimenters (have tried smoking). Body Mass Index (BMI) of the participants was calculated from self reports of weight and height. These were then compared to BMI reference data for childhood obesity. Those participants that reported themselves as slightly overweight or very overweight that were clearly neither of these in accordance with the BMI reference data were assigned as having a 'misperception of being overweight'. Tomeo et al. (1999) found that the misperception of being overweight was higher in the contemplator and experimenter groups than the precontemplator group and higher for females than males as outlined in Table 1.

Table 1

Percentage Misperception of Being Overweight Amongst 9-14 year old Males and Females According to Smoking Status

Smoking Status	% Female	% Male
Precontemplator (Not considering smoking)	10	5
Contemplator (Considering smoking)	15	9*
Experimenter (Has tried smoking)	14	7
	N=8299	N=7067

Note. * denotes significant difference after adjusting for BMI and other known predictors of tobacco uptake.

However, whilst more females than males had a misperception of being overweight Tomeo et al. (1999) reported that after taking into consideration factors such as BMI and other known predictors of smoking initiation the misperception of being overweight was significant only for male contemplators. For females, being overly concerned with weight was significantly associated with contemplation of smoking. Overall the results suggested that weight concerns were positively associated with the contemplation of cigarette smoking, while engaging in weight control behaviours was associated with experimentation of cigarette smoking.

These findings provide support for the Theory of Reasoned Action. If adolescents hold the belief that smoking controls weight, then those adolescents with body weight concerns may rationalise that smoking cigarettes will help them to achieve their ideal body weight. As has already been shown, the adolescents will not

be concerned with long term detrimental health effects of smoking, but will focus on the desired outcome, that is weight control and may begin smoking to achieve this outcome.

While several studies have investigated smoking as a weight control method amongst adults (e.g., Kirven et al. 1992; Ogden & Fox, 1994; Pinto, et al. 1999) few studies have examined a possible relationship between smoking and weight control amongst adolescents. Although the Australian studies into adolescent smoking (i.e., Byrne et al. 1993; Banwell & Young, 1993; Byrne & Reinhart, 1998) explored many of the factors associated with adolescent smoking, weight control as a possible factor in adolescent smoking was not adequately considered. For example, Banwell and Young mentioned that adolescent females were concerned with their weight and that a contribution to young women smoking was that these young women 'consciously watch their weight' (Banwell & Young, 1993, p.380). However, these observations are not researched further. Similarly Byrne et al. (1993) acknowledged that one of the influences on the female adolescent's decision to smoke or not to smoke in the future, was self perceived body weight. It is possible that an association between smoking and weight control amongst adolescents has not been viewed as a credible factor and has largely been ignored.

Smoking, weight control and adolescents

A study of British adolescents by Lloyd and Lucas (cited in Lloyd et al. Lucas, 1998, p. 112) did include an investigation of the relationship between body image and smoking together with other factors. The study confirmed some of the main factors thought to be associated with smoking and adolescents i.e., family

members that smoke, rebelliousness, cool image of smoking amongst adolescent smokers. Results showed that on initial analysis a significant linear relationship (i.e., as weight concerns increased levels of smoking behaviour increased) between smoking behaviour and bodyweight concern was found. However, further analyses after controlling for age and trait neuroticism (a personality trait that leads individuals to experience life as more stressful than those not having this trait) resulted in the relationship being substantially reduced and not significant.

The belief about smoking controlling weight was also one of the items included in the 230 item survey of 6,900, 14 –18 year old male and female adolescents (Wang et al. 1995). They found significant odds ratios for this item amongst 15-18 year old males and females combined, indicating that those individuals that believed smoking controlled weight had an increased chance of being smokers than those who did not believe smoking controlled weight.

An American study (Camp, Klesges & Relyea, 1993) did report a relationship between body weight concerns and smoking. Participants included 659 male and female (African American and Caucasian) American Catholic high school students who completed a self-report questionnaire. The survey investigated factors such as presence of smokers amongst family and friends, perception of numbers of other adolescent smokers, image of smoking, perceived levels of support from family and friends, level of risktaking or rebelliousness and physiological response to a first cigarette. Six items on the questionnaire were taken from the Restrained Eating Scale (Ruderman, 1986) in order to identify those participants characterised as restrained eaters. According to Camp et al. (1993) a restrained eater is a diet conscious person that is liable to binge eat when they believe they have not strictly

adhered to their diet. As a consequence of this perceived lapse in their dietary habits, they may adopt unhealthy weight loss behaviours in an effort to compensate for their perceived overeating. The study also investigated the participants' perceptions of smoking in relation to weight control.

After controlling for the above factors, Camp et al. (1993) found that 40.2% (55.7 % of females and 43.4% of males) of smoking and non-smoking adolescents believed that smoking could control weight. Of the smokers, 67% believed that smoking could control weight. In addition, amongst regular smokers (smoking at least once a week) 39% of female and 12% of male smokers used smoking as a method of weight control. They reported that the adolescent most likely to smoke for weight control reasons was a Caucasian female restrained eater. They concluded that smoking behaviour could not be determined by one single factor, but rather several were involved and that the belief in smoking as a weight control strategy may be one of those factors.

The Present Study

The present study is a replication of the study by Camp et al. (1993). However, as the Australian society differs markedly from the American, race was excluded as a variable. The aim of the study is to investigate the perceptions of Australian male and female adolescents with regards to smoking and body image. Replication of Camp et al. may be attributed to the following reasons:

- The sample obtained by Camp et al. was parochial in nature, as all participants were from Catholic High schools. This may result in confounding factors that may be unrelated to those adolescents under investigation.

- Participants in the study were from the United States of America (U.S.A.) and results may not reflect Australian conditions due to cultural and social differences between the countries.
- The school system in the U.S.A. comprises primary education, junior high and high school education whereas Australia has primary education and senior high school education. Therefore Australian school students may be exposed to influences of older students at an earlier age than American students.
- Differences between restrictions on advertising of tobacco products between Australia and U.S.A. may be a factor, for example in Australia there are more restrictions on advertising in 2000 than there were in 1993.

Rationale

In reviewing the literature on adolescent smoking, several factors have been identified both in Australia and internationally as predictors of smoking initiation amongst adolescents (e.g., the perception of a positive image of smoking, having friends or family members that smoke and perceived low levels of support from family). Some of these factors differ according to gender. In Australia, despite health promotion campaigns targeting some of these factors the numbers of adolescents smoking are not declining in line with other age groups, possibly suggesting that all factors associated with adolescent smoking have not been addressed.

International and Australian literature on body image has indicated that there are higher levels of body dissatisfaction amongst adult and adolescent females than their male counterparts, and that levels of body image dissatisfaction increases with

age. Research has also indicated that individuals with body dissatisfaction are more likely to practice unhealthy weight loss behaviours, such as smoking.

Research indicates that the numbers of female adolescents that smoke increases with age (Byrne et al. 1993), while research into body image (Rosenblum & Lewis, 1999) indicated that the level of body image dissatisfaction amongst female adolescents also increases with age.

While smoking and weight control has been investigated in adults, few studies have examined adolescents. Those studies that have researched smoking and weight control amongst adolescents have shown conflicting findings, with some studies suggesting that smoking for weight control is a factor for smoking initiation amongst adolescents (e.g., Camp et al. 1993) while others have found it not to be a factor (e.g., Lloyd & Lucas, cited in Lloyd et al. 1998, p. 112).

A replication of Camp et al. (1993) will demonstrate whether Australian adolescents perceive an association between smoking and thinness. If this perception is a significant factor in the initiation of smoking, then a change in this impression may lead to a decrease in the number of adolescents beginning to smoke. According to Ajzen (1985, p.19) “A person’s behavioural and normative beliefs are subject to change as events unfold and new information becomes available. Such changes may influence the person’s attitude toward the behaviour or his subjective norm and, as a result produce a revised intention.” Therefore, if perceptions of a relationship between smoking and thinness were altered, adolescents that begin smoking to lose weight would not hold an expectation that smoking controls weight and therefore may not begin to smoke.

If Australian adolescents perceive that smoking is associated with thinness, then this may suggest that health promotion campaigns be developed to address and counteract this belief. This may include health education programs that provide adolescents with knowledge of better and healthier methods of weight control. It may also include more realistic body image portrayals of smokers in media campaigns, as only presenting thin actors as smokers may inadvertently promote a perception of a relationship between smoking and thinness. A change in perception for this age group is particularly relevant as smoking usually begins in early adolescence and once initiated has been found to be resistant to change (McAllister et al. 1995). The consequences of ignoring this factor may lead to continual rises in the number of adolescent smokers.

If the present study finds that female adolescents are significantly more likely than males to associate smoking with weight control, then it would suggest that there is a need for the development of specific programs aimed at female adolescents that address this factor. The consequences of not addressing this factor in health education may lead to an increase in the number of female adolescent smokers, particularly as the literature shows that females are more likely to be dissatisfied with their body image. This may not only affect females that have body image dissatisfaction but may impact on other adolescent female smokers, as the larger the pool of female smokers the higher the likelihood of a female adolescent having female friends or siblings that smoke (which has been associated with smoking initiation).

It is also important to investigate a possible relationship between smoking and weight control in the Australian adolescent population, as this factor has been

largely ignored to date. A significant finding would indicate that smoking for weight control would need to be incorporated into health promotion campaigns, while a nonsignificant finding would eliminate this factor as a concern in adolescent smoking.

The following are the research questions for the present study:

1. Do Australian adolescents perceive that cigarette smoking controls weight?
2. If so, are there gender differences in this perception?
3. Is there a relationship between smoking status and the perceived weight control properties of smoking?
4. Do Australian adolescents smoke to control weight?
5. If so, what are the characteristics of the adolescent that smokes to control weight?

In light of the findings of Camp et al. (1993), a review of the body image literature and the Theory of Reasoned Action it is hypothesised that:

- (1) The belief that smoking is a weight control method will be higher amongst female adolescents than male adolescents.
- (2) The belief that smoking is a weight control method will be higher amongst regular smokers than experimental smokers or those that have never smoked.
- (3) The use of smoking as a weight control method will be higher amongst female restrained eaters (as characterised by the Restrained Eating Scale) than female unrestrained, male restrained and unrestrained eaters.

- (4) The perception of smoking as a weight control method will be a more powerful predictor of experimental and regular smoking amongst female adolescents than other predictor variables.

Method

Participants

Adolescents in the age range of 13- 17 years were chosen for this study in order to encompass both the usual age of smoking onset (approx 12 years) (McAllister et al. 1995) and also to cover the ages where most pubertal development takes place. In the Western Australian school system, this age range is covered by years 9, 10 and 11.

Participants were drawn from years 9, 10 and 11 of three High schools (2 state and 1 private) within the Perth metropolitan district that had agreed to participate in the study. Of the 1051 potential participants, 647 completed questionnaires, which represented a 61.5% response rate. The 404 lost potential participants were due to either non-attendance in class on the day of data collection or refusal to participate (participation was voluntary).

From the 647 completed questionnaires, 22 were not included in the study. Five of the questionnaires had been completed by students outside the sample range (i.e., the students were from year 12) and 17 questionnaires were regarded as spoiled due to large amounts of missing or irrelevant data.

The final sample for the study consisted of 625 participants, (321 male and 304 female) in the age range of 13 – 17 years ($M= 14.32$; $SD = .93$). Of these 43.4% indicated they had never smoked, 34.1% indicated that they had experimented with smoking (i.e., tried smoking but did not smoke on a regular basis), 10.6% indicated that they regularly smoked and 6.1% indicated that they had smoked in the past but no longer smoked. Table 2 presents the numbers of participants by gender and smoking status.

Table 2

Participants By Gender and Smoking Status

Smoking Status	Male	Female	%
Nonsmoker	157	114	46.08
Experimental	94	119	36.22
Regular	24	42	11.22
Quit	22	16	6.46
Total	297	291	

N = 588

Note. 37 cases smoking status not stated

Experimental smokers: Have tried smoking, usually smokes less than one cigarette per week/month

Regular smokers: smokes more than one cigarette per week

Instrument

This was a self-administered questionnaire based on the instrument developed and previously used by Camp et al. (1993) which comprised 37 items over 5 pages (see Appendix A for copies of both instruments). Participants were required to indicate their response by ticking one box per item. Demographic information required of the participants included age, gender and year group at school.

The questionnaire comprised demographic information, smoking status, number of cigarettes smoked per day, numbers of smokers in the individual's environment, individual's beliefs about smoking and weight control, individual's behaviours in regard to smoking and weight control, individual's physiological responses to first cigarette, and individual's eating behaviour. It also included three scales which

measured the individual's perception of the image of smoking, the levels of support from others and the individual's level of risktaking and rebelliousness.

The reliability of items on the instrument were computed by Camp et al. (1993) and are provided below:

- Items 2 and 3 assessed the participant's perception of smoking rates amongst other adolescents; Cronbach's reliability for the whole sample was
- Items 4 –9 made up the instrumental scale, which measured the participant's perception of the instrumental value of smoking. For example, item 4: "If I smoked cigarettes I would look: very cool, somewhat cool, somewhat uncool, very uncool". Cronbach's reliability for the whole sample was .84.
- Items 10-17 comprised the distal scale, which measured the participant's perceptions of the degree of social support and expectations for success, received from others. For example, item 15 "My friends expect me to do well in school: very often, some of the time, not very often, hardly ever". Cronbach's reliability for the whole sample was .71.
- Items 18-22 comprised the risktaking rebellious scale, which measured the level of risktaking and rebelliousness of the participant. For example, item 18: "I do dangerous things just for fun: Very often, some of the time, not very often, hardly ever". Cronbach's reliability for the whole sample was .84.
- Items 23 and 31 measured the participants' beliefs about smoking as a weight control strategy and weight control behaviour. Cronbach's reliability for the whole sample was .75.

- Items 24-29 comprised the diet scale. These items were taken from the Restrained Eating Scale and were used to characterise participants according to their score. High scores characterised the individual as a restrained eater while low scores characterised the individual as an unrestrained eater. Cronbach's reliability for the whole sample was .69.

Scoring criteria of instrument

Items 1-36 were scored in accordance with the scoring criteria as set down by Camp et al. (1993).

- The diet scale items were scored from the left starting at zero. For example, item 28 "Do you have feelings of guilt after overeating" was coded 0 = Never, 1 = Rarely, 2 = Often, and 3 = Always. These scores were then summed.
- The instrumental scale, distal scale and risktaking-rebelliousness scales were reverse scored starting from the left at 3. Higher scores indicated higher levels. For example, item 19 "Compared to others my age, I take risks: was coded 3 = Very often, 2 = Some of the time, 1 = Not very often and 0 = Hardly ever. These scores were then summed and divided by the number of items in the scale to obtain an average value. Item 8 on the instrumental scale was not reverse scored, it was scored as per the diet scale starting at the left with 0.
- Items 32-34 were scored as yes = 1 and no = 2. Scores were then summed to obtain a level of positive experience with a score of 3 indicating a high level of positive physiological reaction to the first cigarette and a score of 6 indicating a negative physiological reaction.

- Items 36 and 37 were also scored as yes = 1 and no = 2, but they were not summed together, they were entered as separate variables.
- Items 1 and 2 were summed and used to assess the influence of smoking models (e.g., parents that smoke, peers etc).
- Item 3 measured the estimate of adolescent smokers and produced a score ranging from 0-10.
- Smoking history (item 30) was coded from 0 for 'never' to 6 for 'one cigarette per day' and was classified as never = 0, quit = 2, experimental smoking = 1, 3,4, and regular smoking = 5, 6.
- Item 37 measured the average consumption rate of cigarettes per day of adolescent smokers.

Amendments to Original Instrument

For the purpose of relevance to an Australian sample two items were altered.

- Item 25 was changed from an imperial measure of weight to a metric measure of weight (Australia adheres to a metric system of weights and measures), i.e., "Would a weight change of 5 pounds affect the way you live your life?" became "would a weight change of 2.5kg affect the way you live your life?"
- Item 26 was altered from "Do you eat sensibly in front of others and splurge alone?" to "Do you eat sensibly in front of others and binge alone?" The word "binge" is an acceptable Australian word (Turner, 1987, p.63) and is commonly used to describe overindulgence, whereas the word "splurge" is not a common term in Australia.

Several items were not included in the study questionnaire that had been included in the original questionnaire (Camp et al. 1993).

- Items on race, availability and cost of cigarettes were not included due to the differences in the Australian and American populations.
- Self reported bodyweight was also not included as no means of verifying the accuracy of the reported bodyweights was available.
- An additional item was included, which was not included in the original questionnaire. This was item 37 regarding the number of cigarettes smoked on average per day, which measured the level of smoking amongst adolescent smokers.
- A further difference between the two questionnaires was that in the present study participants were not required to identify themselves, as identification may lead to less truthful reporting of information from participants.
- There was also an amendment to the scoring of items 32-37. On the scoring criteria of the original questionnaire items 32-37 assessed participant's initial physiological reaction to their first cigarette and was scored as, negative numbers for negative reactions, positive numbers for positive reactions and zero for neutral reactions. However, that scoring criteria was deemed problematic for two reasons. Firstly on the questionnaire items 32-37 were only answered as either "yes" (indicating a negative response) or "no" (indicating a positive response). There was no third option to indicate a neutral response. Secondly, while items 32-34 clearly indicated either a positive or negative response, items 35 and 36 did not. For example, item 35 "When you first smoked cigarettes, did you feel high?" appeared ambiguous or subjective to the participant. 'Feeling high' may

be positive to some participants and negative to others. Item 36 "When you first smoked cigarettes did you feel relaxed?" also did not appear to belong with the other three items which covered dizziness, coughing and feeling sick. Therefore, items 32-34 were scored as yes = 1 and no = 2, these scores were then summed. Items 35 and 36 were also scored yes = 1 and no = 2, but they were entered as separate scores rather than being summed.

Procedure

Permission was obtained from the Department of Education to approach high schools in Perth. School Principals were then contacted by letter to seek permission to carry out the study. Three high schools in the Perth metropolitan area agreed to participate in the study. One private school gave access to 440 students from years 9 - 11, one public school gave access to 261 year 9 students and the other public school gave access to 350 years 9-11 students.

In the interests of minimal disruption to school routine, it was agreed with school principals that the data would be collected by physical education teachers prior to physical education classes. Teachers were provided with an instruction sheet (see Appendix B) in order to standardise instructions given to students. All students from the designated year groups that were present on the days of data collection were handed an information sheet and consent form (see Appendix C). Students were requested to read the information sheet. If they had any questions regarding the information provided they were requested to seek assistance from the teacher. When students had read the information provided, teachers reiterated the voluntary nature of participation and students were then invited to complete the consent form.

Teachers collected completed consent forms and were instructed to only provide questionnaires to those students that had completed consent forms.

A questionnaire and an envelope was issued to each student that had completed a consent form indicating that they wished to participate in the study. Participants were requested to place completed questionnaires into the envelope provided and then to seal the envelope. Teachers then collected the sealed envelopes. When the data had been collected the heads of the physical education departments contacted the researcher who then collected the sealed envelopes and any unused questionnaires.

The questionnaires were then scored and data entered into the computer for analysis. Data was analysed using Statistical Package for the Social Sciences (SPSS) version 8.

Results

Prior to analysis the data was examined for accuracy of data entry, missing values, and outliers through data screening programs in SPSS.

Due to a large amount of missing or incomplete data, the means for all cases was substituted where necessary. This was deemed appropriate because SPSS Logistic Regression excludes missing data from analysis. This would have led to some logistic regressions being unable to be computed due to small numbers contained within some groups. A list of variables and the numbers of missing data substituted by the means for all cases is included below:

number of smokers in household ($n = 1$), number of friends that smoke ($n = 6$), estimate of number of teenage smokers ($n = 3$), perceived instrumental value of smoking ($n = 76$), levels of support and expectations for success received from others ($n = 33$), risktaking and rebelliousness ($n = 11$) and restrained eating score ($n = 12$).

Two cases, 163 and 406 were identified as multivariate outliers through Mahalanobis Distance and were deleted leaving 623 cases included in the analyses. A new variable was created for age to combine 16 year olds and 17 year olds due to small number of cases in the 17 year old age group. Table 3 shows the means and standard deviations of scores according to smoking status.

Table 3
 Means and Standard Deviations (Whole Scores) of Study Variables in Adolescents
 According to Smoking Status

Variable	Never Smokers		Experimental Smokers		Regular Smokers	
	M	SD	M	SD	M	SD
Age (years) ^{a,b}	14.13	.90	14.42	.96	14.68	.88
Grade at school ^{a,b}	9.47	.71	9.65	.73	9.76	.77
No. of smoking models ^{a,b,c}	.90	1.39	2.15	1.87	4.98	2.09
Est.no. Teen smokers ^{a,b,c}	3.79	2.32	4.59	2.42	6.45	2.17
Instrumental value of Smoking (score range 0-18) ^{a,b,c}	5.59	3.51	7.69	2.75	10.62	3.08
Levels of support and expectations for success (score range 0-24) ^b	16.74	3.34	15.68	3.43	15.05	4.02
Risktaking and rebelliousness (score range 0-15) ^{a,b,c}	5.33	3.65	7.48	3.21	10.09	2.74
Perception that smoking controls weight (range 0-2) ^{a,b}	.32	.57	.47	.66	.71	.76
First physiological response to smoking (score range 1-2) ^{a,b}	—	—	2.23	.81	2.00	.91
Restrained eating score (score range 0-19)	6.04	3.42	5.68	3.50	5.82	3.98
Smoke to lose weight ^{a,b,c} (yes = 1, no = 2)	—	—	1.99	.11	1.87	.34
Average no. Cigarettes smoked per day ^c	—	—	.58	.90	3.85	3.47
First cigarette (high) (yes = 1, no = 2) ^{a,b}	—	—	1.91	.29	1.83	.38
First cigarette (relax) (yes = 1, no = 2) ^{a,b,c}	—	—	1.69	.46	1.33	.48

Note. — indicates not applicable

^a Significant difference at 0.05 level between never smokers and experimental smokers. ^b Significant difference at 0.05 level between never smokers and regular smokers. ^c Significant difference at 0.05 level between experimental smokers and regular smokers.

Perception of smoking as a weight control method

A series of chi-square tests (see Appendix D for printouts) for independence or relatedness were conducted to determine whether there was a relationship between the perception of smoking as a weight control method and gender, and the perception of smoking as a weight control method and smoking status.

Before the chi-squares were conducted the variable 'perception that smoking controls weight' was recoded into categorical responses (i.e., smoking does help people control their weight and smoking does not help people control their weight). This was deemed appropriate because the interest was not in degrees of perception but rather, whether or not the participants held the perception that smoking could control weight.

Results indicated that 36.2% of participants ($n = 221$) endorsed the belief that smoking could control weight. There was no significant difference between genders. Smokers (19.6%) (regular 5.9% and experimental 13.7%) were significantly more likely than never smokers (12.2%) to endorse the belief that smoking could control weight, $\chi^2(6) = 26.75 < .001$. Experimental smokers were significantly more likely to endorse the belief than were regular smokers, $\chi^2(1) = 3.96 < .05$.

Logistic Regression

Logistic regression was deemed to be the most appropriate form of statistical analysis for this data set as the dependant variables were dichotomous and predictor variables do not have to be normally distributed. Three logistic regressions (see Appendix D for printouts) were performed on the data as per Camp et al. (1993).

For each model the backward stepwise elimination method in SPSS was used to enter variables. Backward elimination was used rather than other methods in order to remain consistent with replicating the analyses of Camp, Klesges and Relyea (1993). This method starts with all variables in the model. At each step variables are removed or entered according to whether or not they meet the specified removal criteria which was set at 0.1. Variables failing to meet this criteria are removed from the model. Prior to each logistic regression, dichotomous variables were created for the dependant variable. The smoking status 'quit' was not included in the logistic regression analysis as the interest was in predicting never, experimental and regular smokers.

Logistic Regression 1

The first logistic regression compared those adolescents who had never smoked to those adolescents who were regular smokers. The outcome variable was never smoker vs regular smoker. Predictor variables were: gender, age, presence of smoking models, estimate of the prevalence of teenage smokers, perceived instrumental value of smoking, levels of support and expectations for success received from others, risktaking and rebelliousness, perception that smoking controlled weight and the interaction between gender and the perception that smoking controlled weight.

Table 4 shows significant variables, odds ratios, and lower and upper confidence levels. The odds ratio indicates the likelihood of individuals being regular smokers given the presence of the other variables. Six variables significantly predicted smoking status: gender (female), instrumental value of smoking, risktaking/ rebelliousness, presence of smoking models, age and the perception that

smoking controls weight. The interaction between the perception that smoking controls weight and gender was also significant. This provides further support for the main effect that females who hold the belief that smoking can control weight are more likely to be smokers, while males are less likely to be smokers. Levels of support and the estimate of teenage smokers were not significant predictors in the model. Model goodness of fit: $\chi^2(8, n = 330) = 2.05, p = .98$. Table 5 shows the individual contribution of each variable to the model. Results indicated that as levels of these variables increased the likelihood of being a regular smoker increased.

Table 4

Logistic Regression Model Comparing Adolescent Regular Smokers to Adolescent
Never Smokers

Variable	B	Exp (B)	95% confidence intervals		p<
			Lower	Upper	
Gender	3.3225	27.7284	4.4147	174.1592	.001
Instrumental value	1.7726	5.8860	1.7863	19.3945	.005
Risktaking/ rebelliousness	1.5498	4.7107	1.9378	11.4516	.001
Presence of smoking models	.9387	2.5567	1.8506	3.5324	.001
Age	1.0458	2.8457	1.4834	5.4591	.002
Percept of smoking as weight control	2.8591	17.4453	2.4437	124.5420	.005
Interaction Perceptxgender	-2.8635	.0571	.0045	.7261	.03
Constant	-26.5384				

Table 5

Logistic Regression Analysis Outlining in Rank Order the Contribution of Individual Predictors to the Model.

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
Presence of smoking Models	-95.488	88.656	1	.0000
Gender	-61.152	19.986	1	.0001
Risktaking/ rebelliousness	-59.085	15.851	1	.0001
Age	-57.743	13.168	1	.0003
Instrumental value	-56.820	11.322	1	.0008
Percept of smoking as weight control	-56.303	10.288	1	.0013
PerceptxGender	-54.071	5.823	1	.0158

Logistic regression 2

The second logistic regression compared those adolescents who were experimental smokers to those adolescents who were regular smokers. The outcome variable was experimental smoker vs regular smoker. Predictor variables were: gender, age, presence of smoking models, estimate of the prevalence of teenage smokers, perceived instrumental value of smoking, levels of support and expectations for success received from others, risktaking and rebelliousness,

perception that smoking controlled weight, first physiological experience of smoking and the interaction of gender and the perception that smoking controlled weight.

Table 6 shows significant variables, odds ratios, and lower and upper confidence levels. Four variables were significant predictors of smoking status: gender (female), instrumental value of smoking, risktaking and rebelliousness, and presence of smoking models. Model goodness of fit: $\chi^2(8, n = 231) = 9.65, p = .29$. Table 7 shows the individual contributions of each variable to the model.

Results indicated that as levels of the variables in Table 7 increased the likelihood of being a regular smoker increased. The variables levels of support, age, estimate of teenage smokers, perception that smoking controlled weight and the interaction between gender and the perception that smoking controlled weight were not significant predictors of this model.

Table 6

Logistic Regression Model Comparing Adolescent Experimental Smokers to Adolescent Regular Smokers

Variable	B	Exp (B)	Lower	95% confidence intervals		p<
				Upper		
Gender	.8401	2.3165	1.0265	5.2273		.05
Instrumental value	1.4475	4.2526	1.6850	10.7327		.003
Risktaking/rebelliousness	1.0736	2.9260	1.4739	5.8086		.003
Presence of smoking models	.5016	1.6514	1.3743	1.9844		.001
Constant	-13.2788					

Table 7

Logistic Regression Analysis Outlining in Rank Order the Contribution of Individual Predictors to the Model

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
Presence of smoking models	-103.395	36.265	1	.0000
Instrumental value	-90.726	10.928	1	.0009
Risktaking/rebelliousness	-90.657	10.790	1	.0010
Gender	-87.452	4.381	1	.0363

Logistic regression 3

The third logistic regression compared regular smoking adolescents who smoked for weight control with regular smoking adolescents who did not smoke for weight control. The outcome variable was regular smokers who smoked for weight control vs regular smokers who did not smoke for weight control. The predictor variables were gender, year at school, restrained eating score, the interaction between gender and restrained eating score, and the interaction between gender and year at school.

Table 8 shows significant variables, odds ratios and upper and lower confidence levels. The variable, restrained eating was the only significant predictor of smoking to lose weight. Model goodness of fit: $\chi^2(8, n = 61) = 13.73, p = .09$.

Table 9 shows the contribution of the variable restrained eating to the model. The

variables gender, year at school, interaction between restrained eating and gender, and the interaction between gender and year at school were not significant predictors. Results indicated that those adolescents characterised as restricted eaters were more likely to smoke for weight control than adolescents not characterised as restricted eaters.

Table 8

Logistic Regression Model Comparing Adolescents Regular Smokers who Have or Have Not Used Smoking as a Weight Control Strategy

Variable	B	Exp (B)	95% confidence intervals		p<
			Lower	Upper	
Restrained eating	.3120	1.3661	1.1063	1.6869	.001
Constant	-4.2986				

Table 9

Logistic Regression Analysis Outlining in Rank Order the Contribution of Individual Predictors to the Model

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
Restrained eating	-24.426	11.920	1	.0006

Summary of Results

Results indicated that one third of the adolescents that participated in the present study perceived that cigarette smoking controls weight. This perception was equally shared by males and females. More smokers than nonsmokers believed that smoking controls weight and more experimental smokers than regular smokers endorsed this belief.

Age, gender (female), instrumental value of smoking, number of smoking models, risktaking/rebelliousness, the perception that smoking controls weight and the interaction between gender and the perception that smoking controls weight were significant predictors for smokers versus never smokers model. For the second model, experimental smokers versus regular smokers, significant predictors were: gender (female), instrumental value of smoking, number of smoking models, and risktaking/rebelliousness. The third model, regular smokers that smoke to control weight versus regular smokers that do not smoke to control weight, had only one significant predictor, restrained eating.

Discussion

One of the aims of the present study was to replicate the study by Camp et al. (1993) in an Australian sample. The results of the present study were not wholly consistent with the findings of Camp et al. (1993). It was hypothesised that:

- (1) The belief that smoking is a weight control method will be higher amongst female adolescents than male adolescents.
- (2) The belief that smoking is a weight control method will be higher amongst regular smokers than experimental smokers or those that have never smoked.
- (3) The use of smoking as a weight control method will be higher amongst female restrained eaters (as characterised by the Restrained Eating Scale) than female unrestrained, male restrained and unrestrained eaters.
- (4) The perception of smoking as a weight control method will be a more powerful predictor of experimental and regular smoking amongst female adolescents than other predictor variables.

Hypotheses (1), (3) and (4) were not supported. Hypothesis (2) was partially supported.

Do Australian adolescents perceive that cigarette smoking controls weight?

Results indicated that approximately one third of the adolescents (smokers and never smokers) in the study endorsed the belief that smoking controls weight. This was consistent with the findings of Camp et al. (1993). However the gender distribution of the belief in smoking as a weight control strategy was not consistent with the findings of Camp et al. who found that more females than males endorsed

the belief. Results of the present study indicate that males and females equally endorsed the belief. Although this finding was contrary to the predicted hypothesis (1), the findings were consistent with Wang, et al. (1995) who also found no difference between the genders with regards to a belief that smoking controls weight.

This may indicate differences in the perception of smoking as a weight control method between Australian adolescents and American adolescents, however as adolescents in the study by Wang et al. were also American, the findings of Camp et al. may be more indicative of the parochial sample surveyed. That is, the findings may be related to specific characteristics of the sample e.g., religious affiliation, as all the participants in the Camp et al. study were from Catholic schools.

An alternative explanation for the present study's findings may be that as the numbers of adult smokers decrease, as evidenced by the decline in prevalence of adult smoking (AIHW, 1999), adolescents may be less subject to images of smoking and less likely to be influenced by adult perceptions of smoking and weight control.

Is there a relationship between smoking status and the perceived weight control properties of smoking?

The findings of the present study were consistent with Camp et al. (1993) who found that a higher percentage of smokers (regular and experimental) than never smokers endorsed the belief that smoking could control weight. An additional finding of the present study was that the belief was endorsed by a significantly higher percentage of experimental smokers, than regular or never smokers. This finding was contrary to prediction (hypothesis 2).

A possible explanation for this finding may be that experimental smokers who endorse the belief have not smoked long enough to deny their perception. It would be expected that the beliefs would change in time, as according to Ajzen (1985) beliefs may change with the passage of time or in light of new information. While regular smokers' perceptions may change through experience, they may continue to smoke due to their addiction to nicotine. This area may warrant further research into the role of changing beliefs, on behaviour. Future studies investigating perceptions of smoking might include 'length of time smoking', a variable that was not included in the present study.

Comparison of significant findings from both studies.

Predictor variables that were significantly associated with smoking differed between studies. An overview of the significant predictor variables for Camp et al. (1993) and the present study are presented in Table 10.

Table 10

Comparison of Significant Predictor Variables for Camp, Klesges and Relyea (1993) and Replication Study.

Significant Predictor Variables	
Camp et al. (1993)	Present study
Logistic Regression Model 1: Never smoker vs Regular smoker	
Instrumental value of smoking	Instrumental value of smoking
Presence of smoking models	Presence of smoking models
Age	Age
	Gender*
	Risktaking/rebelliousness*
	Weight control belief*
	Weight control belief x Gender*
Logistic Regression Model 2: Experimental smoker vs regular smoker	
Instrumental value of smoking	Instrumental value of smoking
Presence of smoking models	Presence of smoking models
Initial smoking experience*	Gender*
Expectations of support and success*	Risktaking/rebelliousness*
Weight control belief*	
Age*	
Logistic Regression Model 3: Regular smokers, smoking for weight control vs not smoking for weight control	
Restrained eating	Restrained eating
Gender*	
Age*	

Note. * Denotes significant variables, but not in both studies.

The finding in the present study that the perception of smoking as a weight control method was predictive of regular smoking when comparing non-smokers and regular smokers (Logistic Regression Model 1) was contrary to the findings of Camp et al. (1993). This finding was consistent with Wang, et al. (1995) who found that the belief in smoking as a method of weight control was predictive of smoking status for 15- 18 year old adolescents. While Wang et al. reported no significant gender differences the present study found that the perception of smoking as a weight control method was more significant for females. This is consistent with the literature on body image which indicates that both adolescent and adult females are susceptible to society's pressure for thinness and may adopt unhealthy weight loss behaviours such as smoking (Ogden & Fox, 1994; Broom, 1995; Lawson, 1994). This is supported by Field et al. (1999) who found one of the factors (amongst others) that was influential in the development of purging behaviours to control weight was an emphasis on thinness amongst peers.

The other significant predictor variables that separated non-smokers from regular smokers were consistent with much of the literature investigating adolescent smoking (Byrne et al. 1993; Lloyd et al. 1998; Banwell & Young, 1993) which attributes adolescent smoking to a range of factors including holding a positive image of smokers and smoking, family members and friends that smoke, and increasing age.

Although the belief in smoking as a method of weight control was predictive of regular smokers versus non-smokers, it was not predictive of experimental smokers versus regular smokers. This finding was contrary to Camp et al. 1993. Results of the present study indicated that being female, holding a positive evaluation

of smokers and smoking, being a risktaker or rebel, and having friends or family members that smoke are positively associated with regular smoking as opposed to experimental smoking. This may suggest that although the perception of smoking as a weight control method may be a factor in taking up smoking, as indicated by the higher percentage of experimental smokers endorsing the belief than regular smokers, it may not be a factor in the continuation of smoking. This is consistent with the general view, that factors that influence smoking uptake may not be the same factors that influence continuation of the behaviour (McAllister et al. 1995).

Consistent with adolescent smoking literature (e.g. Byrne et al. 1993; Lloyd, et al. 1998; Banwell & Young, 1993; McAllister et al. 1995) a high instrumental value of smoking, presence of smoking models and increasing age were common to both studies as predictors of regular smoking. This suggests that these factors may be internationally (Western countries) common to adolescent smoking. These findings also provide support for the Theory of Reasoned Action (Ajzen, 1985) that states people are more likely to form an intention to perform a behaviour if they evaluate it positively and believe significant others think they should. In the present study individuals that evaluated smoking positively and had family and or friends that smoke were more likely to be regular smokers.

The variable risktaking/ rebelliousness was a predictor of regular smoking for the present study but not for Camp et al. (1993). This may be indicative of character differences between Australian and American adolescents. For example, rebelliousness is often associated with non-compliance, which may fit the stereotypical image of the Australian larrikin, whereas the American adolescent may be more conservative or compliant by nature. Further research is required into

characteristics of Australian and American Adolescents. However risktaking and rebelliousness have been associated with adolescent smoking internationally (e.g., Lloyd et al. 1998) and the findings of Camp et al. may be indicative of the parochial sample (i.e. as the sample were from a school with religious affiliations, participants may not be as rebellious as those from a government school). The finding that risktaking and rebelliousness is a positively associated with regular smoking may pose some problems for health promotion programs. For example by demonising smoking behaviour there is the possibility that the image of smoking may become more attractive to adolescents characterised as risktakers or rebels. This may be one explanation for the numbers of adolescent smokers not decreasing in line with adult rates (AIHW, 1999).

Another predictor variable that was not consistently found across both studies was 'expectations for social support and success received from others'. This variable was significant for regular smoking in the experimental smokers versus regular smokers in Camp et al. (1993) but was not a significant predictor in the present study. This finding for the present study may be related to risktaking and rebelliousness. Adolescents that are characterised as rebellious may be more attached to their peers than their families and may gain the support they need from their peer group (Petraitis et al. 1995).

Another finding that differed between studies was the physiological experience of the first cigarette. In Camp et al. (1993) this was a significant predictor and suggested that adolescents were more likely to be regular smokers if they had a positive first experience with cigarettes. In the present study this was not a significant predictor and suggests that adolescents do not have to have a positive

physiological experience the first time they try a cigarette in order to continue smoking. This is consistent with Banwell and Young (1993) and Lloyd et al. (1998) who reported that some adolescents persevere in spite of a negative first experience with cigarette smoking.

Overall, these findings suggest that different factors are associated with smoking amongst American and Australian adolescents and is consistent with Martin et al. (1982) who also found differences in the predictors of smoking status between American adolescents and Australian adolescents. Australian adolescents' smoking behaviour was mostly influenced by peers, while mothers of American adolescents' were most influential in shaping smoking behaviour (Martin et al.). If American adolescents smoking behaviour is influenced by their mother (Martin et al.) and female adolescents are influenced by their mothers' dieting behaviour (Vincent & McCabe, 2000) then this may account for the higher numbers of adolescent females (Camp et al. 1993) both believing that smoking controls weight and smoking for weight control.

Do Australian adolescents smoke to control weight?

The number of adolescents that reported smoking to control weight was very small and therefore was unable to be analysed using SPSS. A tentative conclusion may be that this is a true reflection of Australian adolescents and they do not smoke for weight control. However this conclusion should be observed with caution due to the small numbers of participants in this group.

A possible explanation for this finding could be related to the age of the participants. In the present study the average age of participants was 14 years, while

in Camp et al. (1993) the average age was 16. It may be that actual smoking for weight control becomes a factor later in the smoker's career. The perception that smoking controls weight may be a factor in the initiation of smoking, while actually smoking to control weight may only become apparent after the onset of smoking. This is consistent with studies that report adult smokers fear weight gain if they quit even though they may not have started smoking to control weight (Klesges et al. 1989).

Another explanation may be that at 14 years of age many of the participants may not be in an advanced stage of puberty. This may be consistent with Field et al. (1999) who found that purging behaviours (i.e., unhealthy weight loss behaviours) were associated with stage of pubertal development rather than age.

Methodological considerations in the present study may also be a factor in the findings. For example the return rate of questionnaires was not very high. This may have been related to the rebelliousness factor that was predictive of regular smokers. It is possible that those who did not complete a questionnaire did so as an act of rebellion. This may have resulted in many regular smokers not being included in the analysis.

The hypothesis that smoking for weight control would be higher amongst female restrained eaters was not supported. Although higher numbers of restrained eating females smoked for weight control than the other groups, consistent with Ogden and Fox, (1993), differences were not significant. This may be indicative of the small sample size ($n = 8$) of regular smokers that reported smoking for weight control. The few smokers that did report smoking for weight control were characterised by higher scores on the restrained eating scale, but not by gender. This

only partially supported the findings of Camp et al. (1993) who found that adolescents smoking for weight control were more likely to be older female adolescents. These findings may be indicative of the small numbers of smokers, smoking for weight control in this study. Alternatively the finding that gender did not predict smoking for weight control may be an indicator that males are experiencing a similar pressure for thinness as females (Rosenblum & Lewis 1999). Should this be a factor then it would suggest the need for health educators to develop programs that address the issue of body image for males as well as females.

Finally the hypothesis that belief in smoking as a weight control method would be a more powerful predictor of experimental and regular smoking amongst females than other variables was not supported. As can be seen in Table 4, belief in smoking as a weight control method recorded a low contribution to the overall model.

Limitations

There were several limitations to the present study that may affect the generalisability of the findings. The average age of the Australian sample was lower than that of Camp et al. (1993), 14 and 16 years respectively. This may have influenced findings in regards to smoking for weight control, 14 year olds may not have been smoking long enough to have confirmed or denied weight control properties of smoking. Future Australian studies may wish to investigate older adolescents in regards to weight control smoking. In addition, the response rate of participants was not very high (61.5%), different findings may have resulted from a larger sample.

Another limitation may be due to missing data, especially on the instrumental scale. It is possible that some of the items did not appeal to an Australian sample. For example, item 6 'If I smoked cigarettes I would be': 'very popular', 'somewhat popular', 'somewhat unpopular', 'very unpopular', seemed to be of particular concern, to the extent that several participants commented on the questionnaire, that smoking had nothing to do with popularity. Smoking status was self-reported and may have been under-reported due to the study being school based. Finally, the study was cross-sectional in design and therefore causal inferences cannot be made. Future studies may be directed at collecting longitudinal data.

Summary

In summary the present study partially replicated the findings of Camp et al. (1993). Some Australian adolescents do perceive that smoking controls weight. Although this perception was not higher amongst the female population as predicted, it was higher amongst experimental smokers than never or regular smokers.

Many of the factors identified as possible predictors of adolescent smoking were consistent with previous Australian studies investigating adolescent smoking (Banwell & Young, 1993; Byrne et al. 1993; Lloyd et al. 1998). These factors also add support to the notion that the decision to smoke is under volitional control and is consistent with the Theory of Reasoned Action (Ajzen, 1985), that is adolescents who were more likely to be regular smokers held positive beliefs about smoking and were in a conducive environment where this behaviour may have been endorsed.

While there was an association between restrained eating and smoking to control weight this was not gender specific. This raises the possibility that males are

becoming more conscious of the pressure for thinness that has usually been associated with females (Rosenblum & Lewis, 1999) and therefore may be at risk for practising unhealthy weight loss behaviours. The finding that more experimental than regular smokers perceive smoking to be a method of weight control may be cause for concern. This may suggest that individual programs be developed to target smoking status along with gender.

This study has shown the perception that smoking controls weight does exist in the Australian adolescent population. However it seems only to be a factor in female adolescent smoking and not in male adolescent smoking. Even though it may only be a small factor in female adolescent smoking at present, there is the potential for it to become more important as the emphasis on thinness continues to be perpetuated. There is also the possibility that it may become an important factor for male adolescent smoking in the future, as males may now be experiencing similar pressures for ideal body images. Therefore health educators should address this factor in the development of new anti smoking strategies aimed at adolescents.

Future research might be directed at investigating the change in factors as the adolescent progresses from one stage of smoking status to the next. Future Australian research might be directed at investigating the origins of the perception that smoking controls weight.

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Appendix A

Questionnaire (Camp, Klesges & Relyea, 1993).

Questionnaire present study.

Appendix A.1

Original Questionnaire used by Camp, Klesges and Relyea (1993).

Memphis Health Project Survey
Memphis State University

1994

- Use No. 2 pencil only.
- Do not use ink, ballpoint, or felt tip pens.
- Make solid marks that fill the bubble completely.

- Erase clearly any marks you wish to change.
- Make no stray marks on this form.
- Do not fold, tear, or mutilate this form.

WRONG MARKS



RIGHT MARK



Section 1

DIRECTIONS: Please write your answer in the boxes and then blacken the correct bubbles. Raise your hand if you need help. Please answer questions honestly. REMEMBER, YOUR ANSWERS ARE CONFIDENTIAL.

1 STUDENT ID NUMBER

0	1	2	3	4	5	6	7	8	9
0	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

2 LOCATION CODE

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

3 GRADE

7

8

9

10

4 HOMEROOM SECTION

0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

5 AGE

<input type="radio"/> 11	<input type="radio"/> 15
<input type="radio"/> 12	<input type="radio"/> 16
<input type="radio"/> 13	<input type="radio"/> 17
<input type="radio"/> 14	<input type="radio"/> 18
	<input type="radio"/> 19 or older

Section 2

DIRECTIONS: Please blacken the one correct bubble for each question.

6 SEX

Female

Male

7 RACE

Asian

Black

Hispanic

White

Other (Please write in): _____

8 HEIGHT (FEET)

4	0
5	0
6	0
7	0
	1
	2
	3
	4
	5
	6
	7
	8
	9
	10

9 WEIGHT (POUNDS)

0	0	0
1	0	0
2	0	0
3	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
	8	0
	9	0

IMPORTANT: If you weigh less than 100 pounds, please put a 0 in the first column. For example, you would put 099 for 99 pounds.

10 HOW MANY OF YOUR FIVE BEST FRIENDS SMOKE AT LEAST ONCE A WEEK?

<input type="radio"/> 1	<input type="radio"/> 3
<input type="radio"/> 2	<input type="radio"/> 4
	<input type="radio"/> 5

11 OUT OF EVERY 10 STUDENTS YOUR AGE, HOW MANY DO YOU THINK SMOKE AT LEAST ONCE A WEEK?

<input type="radio"/> 0	<input type="radio"/> 6
<input type="radio"/> 1	<input type="radio"/> 7
<input type="radio"/> 2	<input type="radio"/> 8
<input type="radio"/> 3	<input type="radio"/> 9
<input type="radio"/> 4	<input type="radio"/> 10
<input type="radio"/> 5	

12 MOST OF THE PEOPLE I LIVE WITH SMOKE CIGARETTES.

Yes No

13 CIGARETTES ARE TOO EXPENSIVE.

Yes No

14 IT IS (OR WOULD BE) EASY FOR ME TO GET CIGARETTES.

Yes No

PLEASE GO ON TO THE NEXT PAGE

Section 3

DIRECTIONS: Read each sentence carefully. Blacken the bubble for the one answer that best fits in the blank.

15. If I smoked cigarettes, I would look _____.

- Very Cool Somewhat Cool Somewhat Uncool Very Uncool

16. If I smoked cigarettes, I would look _____.

- Very Mature Somewhat Mature Somewhat Immature Very Immature

17. If I smoked cigarettes, I would look _____.

- Very Independent Somewhat Independent Somewhat Dependent Very Dependent

18. If I smoked cigarettes, I would be _____.

- Very Popular Somewhat Popular Somewhat Unpopular Very Unpopular

19. If I smoked, it would be _____ to get to know people.

- Very Easy Somewhat Easy Somewhat Difficult Very Difficult

20. Smoking makes you look _____.

- Very Stupid Somewhat Stupid Somewhat Smart Very Smart

21. My friends would be _____ with me if I smoked.

- Very Happy Somewhat Happy Somewhat Unhappy Very Unhappy

22. I am _____ in school.

- Very Successful Somewhat Successful Somewhat Unsuccessful Very Unsuccessful

23. My parents are _____ with how well I'm doing in school.

- Very Happy Somewhat Happy Somewhat Unhappy Very Unhappy

24. My teachers are _____ with how well I'm doing in school.

- Very Happy Somewhat Happy Somewhat Unhappy Very Unhappy

25. I am _____ with how popular I am.

- Very Satisfied Somewhat Satisfied Somewhat Unsatisfied Very Unsatisfied

26. I am considered to be a smart student _____ by teachers.

- Very Often Some of the Time Not Very Often Hardly Ever

27. My friends expect me to do well in school _____.

- Very Often Some of the Time Not Very Often Hardly Ever

28. My friends encourage me to talk to them about my personal problems _____.

- Very Often Some of the Time Not Very Often Hardly Ever

PLEASE GO ON TO THE NEXT PAGE

PLEASE DO NOT WRITE IN THIS AREA



06176

Section 5, Continued

29. Compared to other parents, my parents are _____ with me.

- Very Strict Somewhat Strict Somewhat Easy Very Easy

30. When I need help with problems I'm having, my parents _____ try to give me the help I need.

- Very Often Some of the Time Not Very Often Hardly Ever

31. I do dangerous things just for fun _____.

- Very Often Some of the Time Not Very Often Hardly Ever

32. Compared to others my age, I take risks _____.

- Very Often Some of the Time Not Very Often Hardly Ever

33. I like to do things that bother my teachers _____.

- Very Often Some of the Time Not Very Often Hardly Ever

34. I enjoy doing things people say I shouldn't do _____.

- Very Often Some of the Time Not Very Often Hardly Ever

35. It is _____ worth getting into trouble if I have fun.

- Very Often Some of the Time Not Very Often Hardly Ever

36. Does smoking cigarettes help people control their weight?

- Not at all A fair amount Quite a bit

37. How often are you dieting?

- Never Rarely Sometimes Often Always

38. Would a weight change of 5 pounds affect the way you live your life?

- Not at all Slightly Moderately Very Much

39. Do you eat sensibly in front of others and splurge alone?

- Never Rarely Often Always

40. Do you give too much time and thought to food?

- Never Rarely Often Always

41. Do you have feelings of guilt after overeating?

- Never Rarely Often Always

42. How conscious are you of what you are eating?

- Not at all Slightly Moderately Extremely

PLEASE GO ON TO THE NEXT PAGE

PLEASE DO NOT WRITE IN THIS AREA



06176



Section 4

DIRECTIONS: Read the six sentences below. Blacken the bubble beside the one sentence that is true for you.

43.

- I have never smoked a cigarette, not even a few puffs.
- I have smoked a cigarette or a few cigarettes just to try, but I have not smoked in the past month.
- I no longer smoke, but in the past I was a regular smoker (at least 1 cigarette a week).
- I smoke, but less than one cigarette per month.
- I smoke, but less than one cigarette per week.
- I smoke from one to six cigarettes per week.
- I smoke at least one cigarette per day.

Section 5

DIRECTIONS: If you have ever smoked at least one cigarette in your life, please answer these questions. If you have never smoked (not even one puff of a cigarette), please skip to the directions at the bottom of the page.

44. Have you ever smoked in order to control or lose weight?

- Yes No

45. When you first smoked cigarettes, did you feel dizzy?

- Yes No

46. When you first smoked cigarettes, did you cough?

- Yes No

47. When you first smoked cigarettes, did you feel sick?

- Yes No

48. When you first smoked cigarettes, did you feel high?

- Yes No

49. When you first smoked cigarettes, did you feel relaxed?

- Yes No

50. If you smoke regularly, how do you usually get your cigarettes? (Blacken the bubbles beside all the answers that are true for you.)

- I buy them from a store.
- I buy them from a vending machine.
- My friends give them to me.
- I take cigarettes without any adults knowing.
- Other (Please describe.)

When you finish your survey, put the survey, Student Consent Form, and Student Information Sheet in the envelope and seal it. Raise your hand, and your envelope will be collected. (The researchers will take the sealed envelopes from the school to the University for processing.)

**THANK YOU
FOR YOUR HELP!
SEE YOU NEXT YEAR!**

Appendix A.2

Modified questionnaire as used in present study.

10/10/03

Questionnaire

Please answer the following questions by placing a tick in one of the boxes shown. Please tick only one box per question.

DO NOT WRITE YOUR NAME ANYWHERE ON THE PAPER.

GENDER

Male Female

AGE

13 14 15 16 17

YEAR GROUP

Year 9 Year 10 Year 11

1 How many people in your household smoke (not including yourself)?

0 1 2 3 4
 5 6 7 8 9
 10

2 How many of your five best friends smoke at least once a week?

0 1 2 3 4
 5

3 Out of every ten students your age, how many do you think smoke at least once a week?

0 1 2 3 4
 5 6 7 8 9
 10

4 If I smoked cigarettes I would look:

Very Cool Somewhat Cool Somewhat Uncool Very Uncool

5 If I smoked cigarettes I would look:

Very Mature Somewhat Mature Somewhat Immature Very Immature

6 If I smoked cigarettes I would be:

- Very Popular Somewhat Popular Somewhat Unpopular Very Unpopular

Please indicate missing words by ticking one box only.

7 If I smoked, it would be _____ to get to know people.

- Very Easy Somewhat Easy Somewhat Difficult Very Difficult

8 Smoking makes you look:

- Very Stupid Somewhat Stupid Somewhat Smart Very Smart

9 My friends would be _____ if I smoked

- Very Happy Somewhat happy Somewhat Unhappy Very Unhappy

10 I am _____ in school

- Very Successful Somewhat Successful Somewhat Unsuccessful Very Unsuccessful

11 My parents/guardians are _____ with how well I'm doing in school

- Very Happy Somewhat Happy Somewhat Unhappy Very Unhappy

12 My teachers are _____ with how well I'm doing in school

- Very Happy Somewhat Happy Somewhat Unhappy Very Unhappy

13 I am _____ with how popular I am

- Very Satisfied Somewhat Satisfied Somewhat Unsatisfied Very Unsatisfied

14 I am considered to be a smart student _____ by teachers

Very Often Some of the Time Not Very Often Hardly Ever

15 My friends expect me to do well in school:

Very Often Some of the Time Not Very Often Hardly Ever

16 My friends encourage me to talk about my personal problems:

Very Often Some of the Time Not Very Often Hardly Ever

17 When I need help with problems I'm having, my parents/guardian _____ try to give me the help I need

Very Often Some of the Time Not Very Often Hardly Ever

18 I do dangerous things just for fun:

Very Often Some of the Time Not Very Often Hardly Ever

19 Compared to others my age, I take risks:

Very Often Some of the Time Not Very Often Hardly Ever

20 I like to do things that bother my teachers:

Very Often Some of the Time Not Very Often Hardly Ever

21 I enjoy doing things people say I shouldn't do:

Very Often Some of the Time Not very Often Hardly ever

22 It is _____ worth getting into trouble if I have fun

Very Often Some of the Time Not Very Often Hardly Ever

23 Does smoking cigarettes help people control their weight?

Not at all A fair amount Quite a bit

24 How often are you dieting?

- Never Rarely Sometimes Often Always

25 Would a weight change of 2.5kg affect the way you live your life?

- Not at all Slightly Moderately Very Much

26 Do you eat sensibly in front of others and binge alone?

- Never Rarely Often Always

27 Do you give too much time and thought to food?

- Never Rarely Often Always

28 Do you have feelings of guilt after overeating?

- Never Rarely Often Always

29 How conscious are you of what you are eating?

- Not at all Slightly Moderately Extremely

30

- I have never smoked a cigarette, not even a few puffs.
- I have smoked a cigarette or a few cigarettes just to try, but I have not smoked in the past month.
- I no longer smoke, but in the past I was a regular smoker (at least 1 cigarette a week).
- I smoke, but less than one cigarette per month.
- I smoke, but less than one cigarette per week.
- I smoke from one to six cigarettes per week.
- I smoke at least one cigarette per day.

Only complete questions 31 – 37 if you smoke or have smoked.

31 Have you ever smoked in order to control or lose weight?

Yes

No

32 When you first smoked cigarettes, did you feel dizzy?

Yes

No

33 When you first smoked cigarettes, did you cough?

Yes

No

34 When you first smoked cigarettes, did you feel sick?

Yes

No

35 When you first smoked cigarettes, did you feel high?

Yes

No

36 When you first smoked cigarettes, did you feel relaxed?

Yes

No

37 Please indicate by writing in the box the number of cigarettes on average that you smoke per day?

END

When you have finished answering the questions please put the questionnaire and completed consent form into the envelope provided. Seal the envelope, raise your hand and the envelope will be collected and given to the researcher. You may keep the information sheet.

Thanks for participating.

Appendix B

Teacher instruction sheet.

Thankyou for taking the time to supervise the participating students during the completion of the questionnaires. Students are required to complete the questionnaires without any assistance from teachers or friends. If possible please ensure students are seated at a desk facing front and not in groups.

◆ **Hand out information sheet to each student.**

◆ **Read aloud the following instructions exactly as written:**

“Please read the information sheet. When you have read the information sheet, if you do not wish to participate in the study, please raise your hand. Even though your parents/guardians have given their consent for you to participate, if you do not wish to participate, you do not have to. For those students that do wish to participate please sign the consent form”

◆ **Answer any questions from students**

Any student that declines participation can either follow the usual school procedure for non-participating students or sit quietly.

◆ **Collect consent forms and seal in envelope provided.**

◆ **Hand out questionnaires + envelope to participating students only**

◆ **Read aloud the following instructions:**

“Please read the questions carefully and follow instructions given on the questionnaire. I cannot help you with any questions, you must complete the questionnaire yourself. Do not use a pencil to mark your answers, please use a pen. Please make sure that you do not write your name anywhere on the questionnaire. When you have finished the questionnaire please place it into the envelope and seal it. You may raise your hand and I will then collect the envelope. Please remain seated until all questionnaires have been collected.”

◆ **Collect envelopes containing questionnaires**

◆ **Read aloud the following:**

“Thankyou for taking part in this study. Your help is most appreciated and information that you have provided may help in the development of health programs aimed at reducing rates of smoking amongst adolescents.”

Thankyou once again for assisting in the collection of this important information.

Appendix C

Student information sheet and consent form.

Smoking and Body Image Study

Dear Student

My name is Mary Edwards and I am a fourth year Psychology student at Edith Cowan University, Joondalup Campus. This study is being conducted as part of my Honours degree. The study has been approved by the Ethics Committee of the School of Psychology at Edith Cowan University. Permission to undertake the study has also been granted by your school Principal and your parents or guardians. My supervisors for this study are Alison Salmon and co supervisor Dr Lynne Cohen.

This study will look at male and female adolescent's beliefs and perceptions about smoking and body image. This is an important area of research as many health problems have been associated with cigarette smoking. Information from these types of studies may assist health promotion agencies to design better programs to educate young people about smoking.

Should you agree to participate in this study, you will be required to fill out a questionnaire about your beliefs concerning smoking and health. You will also be required to provide some information about yourself such as age, gender and whether or not you smoke. Please do not put your name anywhere on the questionnaire as all responses remain confidential, therefore no teachers or parents will know the answers that you give. If there is any particular question that you do not wish to answer, you may leave it blank. The questionnaire should take about 15 minutes to complete. When the questionnaire has been completed you will place it into the envelope provided and seal it. Although the information obtained will be used in my thesis and later may be published, no individual participant will be identified.

Your participation in this study is voluntary, even though your parents or guardians have given permission, the final choice remains with you. If you choose to participate you have the right at any time during the study to withdraw without having to give any reason. If you choose to withdraw you will not be penalised in any way.

You may keep this information sheet.

If you would like any information about the results of the study I can be contacted on [REDACTED] or via email on [REDACTED]. My supervisor Alison Salmon can be contacted on [REDACTED] or via email on a.salmon@ecu.edu.au.

Thankyou for your participation.

Yours faithfully

Mary Edwards

Consent Form

Before you fill out the questionnaire, please indicate your consent to participate in this study by signing your name in the space provided.

I _____ give my consent to participate in this study. I have read and understood the information provided. I understand that my participation in this study is voluntary and that I am free to withdraw at any time.

Signed: _____ Date: _____

Thank you for your participation in this study. Please remember do not write your name anywhere on the questionnaire.

Appendix D

Printout of Analyses.

Chi-square: Perception that smoking controls weight x Gender.

Chi-square: Perception that smoking controls weight x Smoking status.

Chi-square: Perception that smoking controls weight x Experimental smoker vs Regular smoker.

Logistic Regression (1): Never smokers vs Regular smokers.

Logistic Regression (2): Experimental smokers vs Regular smokers.

Logistic Regression (3): Regular smokers smoking for weight control vs Regular smokers not smoking for weight control.

Appendix D.1

Chi-square: Perception that smoking controls weight x Gender.

Crosstabs

Case Processing Summary

	Cases	
	Valid	
	N	Percent
perception that smoking controls weight * gender	610	97.9%

Case Processing Summary

	Cases			
	Missing		Total	
	N	Percent	N	Percent
perception that smoking controls weight * gender	13	2.1%	623	100.0%

perception that smoking controls weight * gender Crosstabulation

Count

		gender		Total
		male	female	
perception that smoking controls	.00	202	187	389
perception that smoking controls	1.00	107	114	221
Total		309	301	610

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.695 ^a	1	.404		
Continuity Correction ^a	.562	1	.453		
Likelihood Ratio	.695	1	.404		
Fisher's Exact Test				.448	.227
Linear-by-Linear Association	.694	1	.405		
N of Valid Cases	610				

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 109.05.

Appendix D.2

Chi-square: Perception that smoking controls weight x Smoking status.

Crosstabs

Case Processing Summary

	Cases	
	Valid	
	N	Percent
perception that smoking controls weight * smoking status	574	92.1%

Case Processing Summary

	Cases			
	Missing		Total	
	N	Percent	N	Percent
perception that smoking controls weight * smoking status	49	7.9%	623	100.0%

perception that smoking controls weight * smoking status Crosstabulation

			smoking status			
			never smoked	experimental smoking	quit	experimental smoking
perception that smoking controls weight	.00	Count	195	110	21	9
		Expected Count	172.7	108.8	24.8	13.0
weight	1.00	Count	70	57	17	11
		Expected Count	92.3	58.2	13.2	7.0
Total		Count	265	167	38	20
		Expected Count	265.0	167.0	38.0	20.0

perception that smoking controls weight * smoking status Crosstabulation

			smoking status			Total
			experimental smoking	regular smoking	regular smoking	
perception that smoking controls weight	.00	Count	8	14	17	374
		Expected Count	12.4	19.5	22.8	374.0
	1.00	Count	11	16	18	200
		Expected Count	6.6	10.5	12.2	200.0
Total		Count	19	30	35	574
		Expected Count	19.0	30.0	35.0	574.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.752 ^a	6	.000
Continuity Correction			
Likelihood Ratio	26.160	6	.000
Linear-by-Linear Association	22.921	1	.000
N of Valid Cases	574		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.62.

Appendix D.3

Chi-square: Perception that smoking controls weight x Experimental smoker vs Regular smoker.

Crosstabs

Case Processing Summary

	Cases	
	Valid	
	N	Percent
perception that smoking controls weight * experimental vs regular	271	43.5%

Case Processing Summary

	Cases			
	Missing		Total	
	N	Percent	N	Percent
perception that smoking controls weight * experimental vs regular	352	56.5%	623	100.0%

perception that smoking controls weight * experimental vs regular Crosstabulation

			experimental vs regular		Total
			experimental smoker	regular smoker	
perception that smoking controls weight	.00	Count	127	31	158
		Expected Count	120.1	37.9	158.0
		% within perception that smoking controls weight	80.4%	19.6%	100.0%
		% within experimental vs regular	61.7%	47.7%	58.3%
		% of Total	46.9%	11.4%	58.3%
	1.00	Count	79	34	113
		Expected Count	85.9	27.1	113.0
		% within perception that smoking controls weight	69.9%	30.1%	100.0%
		% within experimental vs regular	38.3%	52.3%	41.7%
		% of Total	29.2%	12.5%	41.7%
Total		Count	206	65	271
		Expected Count	206.0	65.0	271.0
		% within perception that smoking controls weight	76.0%	24.0%	100.0%
		% within experimental vs regular	100.0%	100.0%	100.0%
		% of Total	76.0%	24.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.960 ^a	1	.047		
Continuity Correction ^b	3.406	1	.065		
Likelihood Ratio	3.919	1	.048		
Fisher's Exact Test				.060	.033
Linear-by-Linear Association	3.945	1	.047		
N of Valid Cases	271				

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 27.10.

Appendix D.4

Logistic Regression (1): Never smokers vs Regular smokers.

Backward Stepwise Logistic Regression (1) Never smokers vs Regular smokers

Dependant variable – never smokers vs regular smokers

Predictor variables – Presence of smoking models, age, gender, instrumental value of smoking, levels of support (distal), risktaking/rebelliousness, estimated number of teenage smokers, perception that smoking controls weight, interaction between perception that smoking controls weight and gender.

Total number of cases: 623 (Unweighted)
Number of selected cases: 623
Number of unselected cases: 0

Number of selected cases: 623
Number rejected because of missing data: 293
Number of cases included in the analysis: 330

Dependent Variable Encoding:

Original Value	Internal Value
.00	0
1.00	1

	Value	Freq	Parameter Coding (1)
GENDER			
male	1.00	175	.000
female	2.00	155	1.000
CONWEIGH			
.00	.00	226	.000
1.00	1.00	104	1.000

Interactions:

INT_1 CONWEIGH(1) by GENDER(1)

Dependent Variable.. STATUS1 nonsmokers vs regular smokers

Beginning Block Number 0. Initial Log Likelihood Function

-2 Log Likelihood 327.474

* Constant is included in the model.

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

Classification Table for STATUS1
The Cut Value is .50

Observed		Predicted			Percent Correct
		nonsmoker	regular	smoker	
		n	I	r	
nonsmoker	n	I 265	I	0	I 100.00%
regular smoker	r	I 65	I	0	I .00%
Overall					80.30%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R
Constant	-1.4053	.1384	103.0858	1	.0000	

Variable	Exp(B)	95% CI for Exp(B)	
		Lower	Upper

Beginning Block Number 1. Method: Backward Stepwise (COND)

Variable(s) Entered on Step Number

- 1.. CONWEIGH perception that smoking controls weight
- NEWAGE age
- MODELS_1 SMEAN(MODELS)
- REBEL_1 SMEAN(REBEL)
- DISTAL_1 SMEAN(DISTAL)
- INSTRU_1 SMEAN(INSTRUM)
- TEENSM_1 SMEAN(TEENSMOK)
- GENDER gender
- CONWEIGH * GENDER

Estimation terminated at iteration number 7 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood	101.969
Goodness of Fit	143.462
Cox & Snell - R ²	.495
Nagelkerke - R ²	.787

	Chi-Square	df	Significance
Model	225.505	9	.0000
Block	225.505	9	.0000
Step	225.505	9	.0000

----- Hosmer and Lemeshow Goodness-of-Fit Test -----

Group	STATUS1 = nonsmoker		STATUS1 = regular smoker		Total
	Observed	Expected	Observed	Expected	
1	33.000	32.999	.000	.001	33.000
2	33.000	32.995	.000	.005	33.000
3	33.000	32.980	.000	.020	33.000
4	33.000	32.936	.000	.064	33.000
5	33.000	32.826	.000	.174	33.000
6	33.000	32.387	.000	.613	33.000
7	30.000	30.961	3.000	2.039	33.000
8	25.000	25.299	8.000	7.701	33.000
9	11.000	10.961	22.000	22.039	33.000
10	1.000	.656	32.000	32.344	33.000

	Chi-Square	df	Significance
Goodness-of-fit test	1.5718	8	.9915

Classification Table for STATUS1
The Cut Value is .50

Observed		Predicted			Percent Correct
		nonsmoker n	regular I	smoker r	
nonsmoker	n	I 255	I 10	I	96.23%
regular smoker	r	I 16	I 49	I	75.38%
Overall					92.12%

FINAL STEP

	Chi-Square	df	Significance
Model	225.155	.7	.0000
Block	225.155	7	.0000
Step	-.253	1	.6149

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

----- Hosmer and Lemeshow Goodness-of-Fit Test -----

Group	STATUS1 = nonsmoker		STATUS1 = regular smoker		Total
	Observed	Expected	Observed	Expected	
1	33.000	32.999	.000	.001	33.000
2	33.000	32.995	.000	.005	33.000
3	33.000	32.979	.000	.021	33.000
4	33.000	32.936	.000	.064	33.000
5	33.000	32.821	.000	.179	33.000
6	33.000	32.344	.000	.656	33.000
7	30.000	30.978	3.000	2.022	33.000
8	24.000	25.335	9.000	7.665	33.000
9	12.000	10.934	21.000	22.066	33.000
10	1.000	.678	32.000	32.322	33.000

	Chi-Square	df	Significance
Goodness-of-fit test	2.0580	8	.9792

Classification Table for STATUS1
The Cut Value is .50

Observed		Predicted			Percent Correct
		nonsmoker n	regular I	smoker r	
nonsmoker	n	I 256	I 9	I	96.60%
regular smoker	r	I 15	I 50	I	76.92%
Overall					92.73%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R
CONWEIGH(1)	2.8591	1.0029	8.1277	1	.0044	.1368
NEWAGE	1.0458	.3324	9.9001	1	.0017	.1553
MODELS_1	.9387	.1649	32.3998	1	.0000	.3047
REBEL_1	1.5498	.4532	11.6935	1	.0006	.1720
INSTRU_1	1.7726	.6084	8.4890	1	.0036	.1408
GENDER(1)	3.3225	.9375	12.5590	1	.0004	.1796
CONWEIGH(1) by GENDER(1)	-2.8635	1.2977	4.8692	1	.0273	-.0936
Constant	-26.5384	5.9463	19.9184	1	.0000	

Variable	Exp(B)	95% CI for Exp(B)	
		Lower	Upper
CONWEIGH(1)	17.4453	2.4437	124.5420
NEWAGE	2.8457	1.4834	5.4591
MODELS_1	2.5567	1.8506	3.5324
REBEL_1	4.7107	1.9378	11.4516
INSTRU_1	5.8860	1.7863	19.3945
GENDER(1)	27.7284	4.4147	174.1592
CONWEIGH(1) by GENDER(1)	.0571	.0045	.7261

----- Model if Term Removed -----
Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
CONWEIGH	-56.303	10.288	1	.0013
NEWAGE	-57.743	13.168	1	.0003
MODELS_1	-95.488	88.656	1	.0000
REBEL_1	-59.085	15.851	1	.0001
INSTRU_1	-56.820	11.322	1	.0008
GENDER	-61.152	19.986	1	.0000
CONWEIGH * GENDER	-54.071	5.823	1	.0158

----- Variables not in the Equation -----
Residual Chi Square .352 with 2 df Sig = .8388

Variable	Score	df	Sig	R
DISTAL_1	.1115	1	.7385	.0000
TEENSM_1	.2549	1	.6136	.0000

No more variables can be deleted or added.

Appendix D.5

Logistic Regression (2): Experimental smokers vs Regular smokers.

Backward Stepwise Logistic Regression (2) Experimental smokers vs Regular smokers

Dependant variable Experimental smokers vs regular smokers.

Predictor variables- Age, gender, instrumental value of smoking, levels of support (distal), risktaking/rebelliousness, perception that smoking controls weight, presence of smoking models, estimated number of teenage smokers, physiological reaction to first cigarette, interaction between perception that smoking controls weight and gender.

Total number of cases: 623 (Unweighted)
Number of selected cases: 623
Number of unselected cases: 0

Number of selected cases: 623
Number rejected because of missing data: 392
Number of cases included in the analysis: 231

Dependent Variable Encoding:

Original Value	Internal Value
.00	0
1.00	1

	Value	Freq	Parameter Coding (1)
GENDER			
male	1.00	95	.000
female	2.00	136	1.000
CONWEIGH			
	.00	130	.000
	1.00	101	1.000

Interactions:

INT_1 CONWEIGH(1) by GENDER(1)

Dependent Variable.. STATUS2 experimental vs regular

Beginning Block Number 0. Initial Log Likelihood Function

-2 Log Likelihood 266.6989

* Constant is included in the model.

Estimation terminated at iteration number 3 because
Log Likelihood decreased by less than .01 percent.

Classification Table for STATUS2
The Cut Value is .50

Observed		Predicted			Percent Correct
		experimental smo e	regular smoker I	regular smoker r	
experimental smo	e	I 170	I	0	I 100.00%
regular smoker	r	I 61	I	0	I .00%
Overall					73.59%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R
Constant	-1.0249	.1493	47.1574	1	.0000	

Variable	Exp(B)	95% CI for Exp(B)	
		Lower	Upper

Beginning Block Number 1. Method: Backward Stepwise (COND)

Variable(s) Entered on Step Number

- 1.. CONWEIGH perception that smoking controls weight
- NEWAGE age
- MODELS_1 SMEAN(MODELS)
- REBEL_1 SMEAN(REBEL)
- DISTAL_1 SMEAN(DISTAL)
- INSTRU_1 SMEAN(INSTRUM)
- TEENSM_1 SMEAN(TEENSMOK)
- GENDER gender
- CONWEIGH * GENDER
- POSPHYSI positive physiological experience of first cigarette

Estimation terminated at iteration number 5 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood	170.026
Goodness of Fit	180.867
Cox & Snell - R ²	.342
Nagelkerke - R ²	.499

	Chi-Square	df	Significance
Model	96.672	10	.0000
Block	96.672	10	.0000
Step	96.672	10	.0000

----- Hosmer and Lemeshow Goodness-of-Fit Test -----

STATUS2 = experimental smo STATUS2 = regular smoker

Group	Observed	Expected	Observed	Expected	Total
1	23.000	22.802	.000	.198	23.000
2	23.000	22.458	.000	.542	23.000
3	22.000	21.979	1.000	1.021	23.000
4	23.000	21.413	.000	1.587	23.000
5	23.000	20.410	.000	2.590	23.000
6	14.000	19.140	9.000	3.860	23.000
7	15.000	16.852	8.000	6.148	23.000
8	15.000	13.115	8.000	9.885	23.000
9	8.000	8.305	15.000	14.695	23.000
10	4.000	3.525	20.000	20.475	24.000

Chi-Square df Significance
 Goodness-of-fit test 15.0875 8 .0575

Classification Table for STATUS2
 The Cut Value is .50

Observed		Predicted			Percent Correct
		experimental smo e	regular smoker I	regular smoker r	
experimental smo	e	I 158	I 12	I	92.94%
regular smoker	r	I 25	I 36	I	59.02%
Overall					83.98%

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R
CONWEIGH(1)	.1813	.6639	.0746	1	.7848	.0000
NEWAGE	.4031	.2259	3.1821	1	.0745	.0666
MODELS_1	.4804	.1014	22.4233	1	.0000	.2767
REBEL_1	1.0546	.3697	8.1357	1	.0043	.1517
DISTAL_1	-.0237	.4557	.0027	1	.9584	.0000
INSTRU_1	1.3615	.4972	7.4979	1	.0062	.1436
TEENSM_1	.0427	.0942	.2051	1	.6506	.0000
GENDER(1)	.7922	.5616	1.9895	1	.1584	.0000
CONWEIGH(1) by GENDER(1)	-.0278	.8190	.0012	1	.9729	.0000
POSPHYSI	-.0727	.2492	.0851	1	.7705	.0000
Constant	-13.1333	3.7920	11.9954	1	.0005	

Variable	Exp(B)	95% CI for Exp(B)	
		Lower	Upper
CONWEIGH(1)	1.1988	.3263	4.4044
NEWAGE	1.4964	.9610	2.3301
MODELS_1	1.6167	1.3252	1.9723
REBEL_1	2.8707	1.3909	5.9252
DISTAL_1	.9765	.3998	2.3853
INSTRU_1	3.9019	1.4725	10.3394
TEENSM_1	1.0436	.8677	1.2552
GENDER(1)	2.2082	.7345	6.6393
CONWEIGH(1) by GENDER(1)	.9726	.1953	4.8428
POSPHYSI	.9299	.5706	1.5154

Model if Term Removed
 Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
CONWEIGH	-85.050	.074	1	.7851
NEWAGE	-86.667	3.308	1	.0690
MODELS_1	-98.577	27.127	1	.0000
REBEL_1	-89.615	9.204	1	.0024
DISTAL_1	-85.015	.003	1	.9585
INSTRU_1	-89.405	8.784	1	.0030
TEENSM_1	-85.116	.205	1	.6505
GENDER	-86.046	2.066	1	.1506
CONWEIGH * GENDER	-85.014	.001	1	.9729
POSPHYSI	-85.056	.085	1	.7708

FINAL STEP

Variable(s) Removed on Step Number
 6.. TEENSM_1 SMEAN(TEENSMOK)

Estimation terminated at iteration number 5 because
 Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 170.524
 Goodness of Fit 189.948
 Cox & Snell - R² .341
 Nagelkerke - R² .497

	Chi-Square	df	Significance
Model	96.175	5	.0000
Block	96.175	5	.0000
Step	-.217	1	.6411

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

----- Hosmer and Lemeshow Goodness-of-Fit Test-----

STATUS2 = experimental smo STATUS2 = regular smoker

Group	Observed	Expected	Observed	Expected	Total
1	23.000	22.810	.000	.190	23.000
2	22.000	22.451	1.000	.549	23.000
3	23.000	21.980	.000	1.020	23.000
4	23.000	21.427	.000	1.573	23.000
5	21.000	20.399	2.000	2.601	23.000
6	17.000	19.059	6.000	3.941	23.000
7	13.000	16.837	10.000	6.163	23.000
8	16.000	13.141	7.000	9.859	23.000
9	9.000	8.389	14.000	14.611	23.000
10	3.000	3.507	21.000	20.493	24.000

	Chi-Square	df	Significance
Goodness-of-fit test	9.6512	8	.2904

Classification Table for STATUS2
 The Cut Value is .50

Observed		Predicted			Percent Correct
		experimental smo	regular smoker		
experimental smo	e	I 157	I 13	I	92.35%
regular smoker	r	I 26	I 35	I	57.38%
Overall					83.12%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R
NEWAGE	.4018	.2237	3.2259	1	.0725	.0678
MODELS_1	.5016	.0937	28.6523	1	.0000	.3161
REBEL_1	1.0736	.3499	9.4169	1	.0021	.1668
INSTRU_1	1.4475	.4723	9.3921	1	.0022	.1665
GENDER(1)	.8401	.4152	4.0928	1	.0431	.0886
Constant	-13.2788	3.5651	13.8731	1	.0002	

Variable	Exp(B)	95% CI for Exp(B)	
		Lower	Upper
NEWAGE	1.4946	.9640	2.3172
MODELS_1	1.6514	1.3743	1.9844
REBEL_1	2.9260	1.4739	5.8086
INSTRU_1	4.2526	1.6850	10.7327
GENDER(1)	2.3165	1.0265	5.2273

----- Model if Term Removed -----
Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
NEWAGE	-86.938	3.352	1	.0671
MODELS_1	-103.395	36.265	1	.0000
REBEL_1	-90.657	10.790	1	.0010
INSTRU_1	-90.726	10.928	1	.0009
GENDER	-87.452	4.381	1	.0363

----- Variables not in the Equation -----
Residual Chi Square .498 with 5 df Sig = .9922

Variable	Score	df	Sig	R
CONWEIGH(1)	.2157	1	.6423	.0000
DISTAL_1	.0015	1	.9691	.0000
TEENSM_1	.2177	1	.6408	.0000
CONWEIGH(1) by GENDER(1)	.1112	1	.7387	.0000
POSPHYSI	.1032	1	.7480	.0000

No more variables can be deleted or added.

Appendix D.6

Logistic Regression (3): Regular smokers,
smoking for weight control vs Regular smokers
not smoking for weight control.

Backward Stepwise Logistic Regression (3)

Regular smokers that smoke for weight control vs Regular smokers that do not smoke for weight control

Dependant variable – Regular smokers that smoke for weight control vs regular smokers that do not smoke for weight control.

Predictor variables – Gender, grade at school, restrained eating score, interaction between gender and grade at school, interaction between restrained eating score and gender.

Total number of cases: 623 (Unweighted)
 Number of selected cases: 623
 Number of unselected cases: 0

Number of selected cases: 623
 Number rejected because of missing data: 562
 Number of cases included in the analysis: 61

Dependent Variable Encoding:

Original Value	Internal Value
.00	0
1.00	1

	Value	Freq	Parameter Coding (1)
GENDER			
male	1.00	22	.000
female	2.00	39	1.000

Interactions:

INT_1 GENDER(1) by YEAR
 INT_2 DIET_1 by GENDER(1)

Dependent Variable.. REGCON regular smokers who smoke to lose weight vs regular smokers who don't smoke to lose weight

Beginning Block Number 0. Initial Log Likelihood Function

-2 Log Likelihood 47.404604

* Constant is included in the model.

Estimation terminated at iteration number 4 because parameter estimates changed by less than .001

Classification Table for REGCON
 The Cut Value is .50

Observed	regular smoker n	r	Predicted			Percent Correct
			regular smoker r	Regular smoker I	Regular smoker s R	
regular smoker n	r	I	53	I	0	100.00%
Regular smoker s	R	I	8	I	0	.00%
Overall						86.89%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R
Constant	-1.8909	.3793	24.8514	1	.0000	

Variable	Exp(B)	95% CI for Exp(B)	
		Lower	Upper

Beginning Block Number 1. Method: Backward Stepwise (COND)

Variable(s) Entered on Step Number

- 1.. GENDER gender
- YEAR year at school
- DIET_1 SMEAN(DIET)
- GENDER * YEAR
- DIET_1 * GENDER

Estimation terminated at iteration number 6 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood	35.396
Goodness of Fit	62.886
Cox & Snell - R ²	.179
Nagelkerke - R ²	.331

	Chi-Square	df	Significance
Model	12.009	5	.0347
Block	12.009	5	.0347
Step	12.009	5	.0347

----- Hosmer and Lemeshow Goodness-of-Fit Test -----

REGCON = regular smoker n REGCON = Regular smoker s

Group	Observed	Expected	Observed	Expected	Total
1	6.000	5.976	.000	.024	6.000
2	6.000	5.924	.000	.076	6.000
3	5.000	5.826	1.000	.174	6.000
4	6.000	5.755	.000	.245	6.000
5	7.000	6.595	.000	.405	7.000
6	5.000	5.495	1.000	.505	6.000
7	4.000	3.556	.000	.444	4.000
8	5.000	5.978	2.000	1.022	7.000
9	6.000	4.703	.000	1.297	6.000
10	3.000	3.193	4.000	3.807	7.000

	Chi-Square	df	Significance
Goodness-of-fit test	8.6130	8	.3760

Classification Table for REGCON
The Cut Value is .50

Observed		Predicted	regular smoker n		Regular smoker s		Percent Correct	
			r	I	R	I		
regular smoker n	r	I	51	I	2	I	96.23%	
Regular smoker s	R	I	5	I	3	I	37.50%	
							Overall	88.52%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R
GENDER(1)	-1.2764	13.0729	.0095	1	.9222	.0000
YEAR	-.7665	1.1870	.4170	1	.5184	.0000
DIET_1	.4441	.2254	3.8818	1	.0488	.1992
GENDER(1) by YEAR	.2848	1.4185	.0403	1	.8409	.0000
DIET_1 by GENDER(1)	-.2035	.2645	.5916	1	.4418	.0000
Constant	2.0878	10.6452	.0385	1	.8445	

Variable	Exp(B)	95% CI for Exp(B)	
		Lower	Upper
GENDER(1)	.2790	.0000	3.744E+10
YEAR	.4646	.0454	4.7587
DIET_1	1.5590	1.0023	2.4250
GENDER(1) by YEAR	1.3295	.0825	21.4372
DIET_1 by GENDER(1)	.8159	.4858	1.3703

----- Model if Term Removed -----
Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
GENDER	-17.703	.010	1	.9222
YEAR	-17.940	.484	1	.4864
DIET_1	-24.199	13.003	1	.0003
GENDER * YEAR	-17.718	.041	1	.8394
DIET_1 * GENDER	-18.065	.735	1	.3913

FINAL STEP

Variable(s) Removed on Step Number
5.. YEAR year at school

Estimation terminated at iteration number 5 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 36.932
 Goodness of Fit 102.673
 Cox & Snell - R² .158
 Nagelkerke - R² .292

	Chi-Square	df	Significance
Model	10.472	1	.0012
Block	10.472	1	.0012
Step	-.602	1	.4378

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

----- Hosmer and Lemeshow Goodness-of-Fit Test -----

REGCON = regular smoker n REGCON = Regular smoker s

Group	Observed	Expected	Observed	Expected	Total
1	5.000	5.910	1.000	.090	6.000
2	6.000	5.852	.000	.148	6.000
3	7.000	6.766	.000	.234	7.000
4	7.000	6.684	.000	.316	7.000
5	5.000	4.658	.000	.342	5.000
6	4.000	4.594	1.000	.406	5.000
7	8.000	7.139	.000	.861	8.000
8	5.000	4.250	.000	.750	5.000
9	4.000	4.399	2.000	1.601	6.000
10	2.000	2.749	4.000	3.251	6.000

	Chi-Square	df	Significance
Goodness-of-fit test	13.7320	8	.0890

Classification Table for REGCON
 The Cut Value is .50

Observed		Predicted			Percent Correct
		regular smoker n	Regular smoker s		
regular smoker n	r	I	I	I	96.23%
Regular smoker s	R	I	I	I	25.00%
Overall					86.89%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R
DIET_1	.3120	.1076	8.4031	1	.0037	.3675
Constant	-4.2986	1.0693	16.1611	1	.0001	

Variable	Exp(B)	95% CI for Exp(B)	
		Lower	Upper
DIET_1	1.3661	1.1063	1.6869

----- Model if Term Removed -----
 Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
DIET_1	-24.426	11.920	1	.0006

----- Variables not in the Equation -----
 Residual Chi Square 1.430 with 4 df Sig = .8389

Variable	Score	df	Sig	R
GENDER(1)	.1741	1	.6765	.0000
YEAR	.5869	1	.4436	.0000
GENDER(1) by YEAR	.2420	1	.6228	.0000
DIET_1 by GENDER(1)	.4452	1	.5046	.0000

No more variables can be deleted or added.