(MIS)REMEMBERING HEALTH MESSAGES:

ATTITUDE ACCESSIBILITY, MESSAGE TYPE, AND DELAYED MESSAGE RECALL

by

ELISABETH BIGSBY

(Under the Direction of Jennifer L. Monahan)

ABSTRACT

This dissertation focuses on attitude accessibility's impact on message perceptions and future recall as prior research demonstrates accessibility is the mechanism through which media campaigns can have their strongest influence (Berger & Mitchell, 1989; Roskos Ewoldsen, Klinger, & Roskos-Ewoldsen, 2007). Specifically, this dissertation used attitude accessibility and message type to predict which anti-smoking Public Service Announcements (PSAs) young adolescents would accurately recall 12 weeks after message exposure. Part of a larger grant project, a 2 (Sex) x 2 (Race: African American vs. White) x 2 (Condition: viewed personal testimony vs. second-half punch messages) x 3 (Message Order: nested within condition) mixed design was used in a study conducted with high school students in low-income counties in Georgia. Ninth graders (N = 244) responded to all items and viewed PSAs on laptop computers. Twelve weeks later, follow-up telephone surveys were conducted to assess unaided (i.e., no cues) recall. Multilinear or probit regression models were estimated in STATA 10.0. Results show attitude accessibility did not have a direct impact on delayed unaided recall, however, moderating effects were found. Adolescents with highly accessible negative attitudes toward smoking engaged in more message elaboration and recalled anti-smoking PSAs more frequently

than other adolescents. On the other hand, those with highly accessible positive attitudes toward smoking perceived messages as more biased and accurately recalled PSAs less frequently. Therefore, PSAs were successful for adolescents with highly accessible, message consistent attitudes and likely ineffective for adolescents with highly accessible, message inconsistent attitudes. Few significant differences were found among adolescents with low smoking attitude accessibility, suggesting attitude change and/or reinforcement may be successful with this population. In addition, two different types of anti-smoking messages were used and compared. Both general components and health advocacies of personal testimony or narrative PSAs were accuracy recalled more frequently than PSAs with surprise/twist endings (i.e., second-half punch).

INDEX WORDS: attitude accessibility, unaided recall, memory, smoking, public service announcements, young adolescents, health communication

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CHAPTER 1

INTRODUCTION

Study Context and Importance

Adolescent smoking has been identified as an international public health concern. The Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), and the Canadian Public Health Association (CPHA) created the Global Youth Tobacco Survey (GYTS) to track the tobacco-related behaviors of young adolescents aged 13 to 15 all over the world (Centers for Disease Control and Prevention [CDC], 2009) in an attempt to identify young smoking patterns and to reduce smoking prevalence. To overview the gravity of the issue, consider that approximately 4.5 million U.S. adolescents smoked cigarettes in 2003 (American Lung Association, 2003) and the GYTS estimated that half of all 6^{th}-12^{th} graders had at least tried smoking (CDC, 2000). Most smokers begin the habit during their teenage years and, within cohort, the number of adolescent smokers increases each year of middle and high school (American Lung Association, 2003; CDC 2005a). The most recent numbers reported from the CDC estimate 20% of high school students and 6% of middle school students smoke cigarettes (CDC, 2007a). In Georgia, high school student smoking prevalence is close to the national average (19%); however, adolescents seem to begin smoking at a younger age with 9% of middle school students classified as smokers (Georgia Department of Human Resources [GDHR], 2005). Preventing smoking initiation among adolescents has become a priority in southern states as they have some of the highest adult smoking prevalence in the country (CDC, 2005b).

In anti-tobacco efforts, there is specific interest in the young adolescent population because of a desire to prevent smoking initiation. For example, the American Legacy Foundation, funders of the truth campaign, state that they are the largest smoking prevention campaign aimed at adolescents in the country. According to their information, the majority of teenagers start smoking before 18-years-of-age and thus they focus on that pre-18 population (American Legacy Foundation, n.d.). In addition, prior research has found smoking prevention must target young adolescents to be successful (e.g., Chassin, Corty, Presson, Olshavsky, Bensenberg, & Sherman, 1981; Kelder, Perry, Klepp, & Lytle, 1994; Pfau, Van Bockern, & Kang, 1992). The transition from primary to middle/junior high school in particular has been found to be an important time to help adolescents with low self-esteem establish and reinforce negative smoking attitudes (Pfau, et al., 1992). However, as the national adolescent smoking prevalence increases by 14% between middle/junior high and high school, prevention efforts should also focus on that transitional year. Therefore, this dissertation recruited 9th grade students to participate a study to gain a better understanding of the effectiveness of mediated messages presumably designed with this population in mind.

Study Overview

As a project out of a larger 3-year grant, this dissertation adds to the tobacco-related research by examining young adolescent perceptions and retention of anti-smoking Public Service Announcements (PSAs). Comprehensive campaigns have found that the media play an important role in reducing demand for cigarettes (U.S. Department of Health and Human Services [DHHS], 2000) and teen smoking (Farrelly, Davis, Haviland, Healton, & Messeri, 2005). The Guide to Community Preventive Services (2000) conducted a systematic review of published studies and reported that mass media campaigns are effective in decreasing

consumption of tobacco and increasing tobacco use cessation. They also found that media campaigns, when combined with other actions, are effective in reducing initiation of tobacco use. Indeed, the guide recommends for media messages to be implemented in prevention and cessation efforts based on strong evidence of effectiveness.

While the research on health-related message perceptions and processing continues to grow and explore new areas, this project focuses on two unique aspects of this type of research: a) young adolescent message recall, and b) attitude accessibility's effect on delayed unaided mediated message recall. Information (or message) retention and the recall of that information are important to any campaign because if that information is not remembered, it has no impact on an individual's decision-making process or behavior. Research in both areas is limited, which provides an opportunity for this dissertation to add to existing literature. A brief overview of these areas is provided below before the theoretical rationale is outlined in Chapter 2.

An important consideration missing from the study of health messages and campaigns that target adolescents are the differences in memory that exist between adolescents and adults. Little communication research specifically takes into account the psychological changes adolescents' experience that affect their ability to process and remember messages. Importantly, our ability to recall and interpret messages steadily improves from childhood to adulthood (Case, Kurland, & Goldberg, 1982; Hulme, Thomson, Muir, & Lawrence, 1984; Siegel, 1994). This improvement occurs at a rapid pace and significant differences occur at least every two years (Gathercole, Pickering, Ambridge & Wearing, 2004), making differences between young adolescents and adults too significant to ignore. For example, children and young adolescents struggle with providing interpretation when recalling things they have seen or heard (Adams, 1991). Adults and young adolescents even use different rules when deciding what information to

store for future use (Bjorklun & de Marchena, 1984). Thus, the memory of a young adolescent functions more similarly to that of a child than an adult. Clearly, these differences in memory can have a profound impact on not only the ability to recall health messages, but *what* information is recalled. Most communication research is conducted with adult populations; however, many health campaigns specifically target adolescents in order to prevent the initiation of unhealthy behaviors (i.e., cigarette smoking, drug use, drinking, ect.). It is therefore extremely important to examine young adolescents recall abilities in order to improve targeting strategies. It may be that some messages are too sophisticated for young adolescents to truly grasp, losing the real point of the message.

In communication research, theories of persuasion, such as the elaboration likelihood model (Petty & Cacioppo, 1986), heuristic-systematic model (Chaiken, Liberman, & Eagly, 1989), extended parallel process model (Witte, 1992), and attitude accessibility model (Fazio, 1986; Roskos-Ewoldsen, 1997) have been instrumental in our understanding of how health messages may be effective (or not) for specific populations. Combining a theoretical understanding of memory with these theories will help health communicators and practitioners create better messages for young adolescents, as being able to remember a message/advocacy lays the foundation for attitude reinforcement/change or behavior reinforcement/change. In this dissertation, attitude accessibility is the persuasion model used to examine message perceptions and message retention of mediated anti-smoking PSAs as it is based on theoretical understandings of memory. While attitude accessibility has been used to examine biased message processing (Shen, Monahan, Rhodes, & Roskos-Ewoldsen, 2009), message elaboration (Roskos-Ewoldsen, Bishsel, & Hoffman, 2002), and behavior (Fazio, Chen, McDonel, & Sherman, 1982), this study is the first to examine its impact on delayed message recall. As will

be outlined more fully in Chapter 2, topic exposure can reinforce both positive and negative attitudes. Particularly in prevention efforts, care must be taken to reach audiences that have not formed attitudes counter to the message advocacy. This concern again provides an argument to focus smoking prevention efforts on young adolescents.

The next chapter provides the theoretical rationale behind this dissertation. It describes attitude accessibility and its relationship to message processing, outlines theories of memory and memory research, and details differences between message types. Hypotheses about the impact of attitude accessibility on message perception and message retention for young adolescents are forwarded. Chapter 3 presents the methodology for testing the proposed hypotheses in a field experiment, and Chapter 4 presents the results from the field experiment. Finally, Chapter 5 provides an in-depth discussion of the findings, limitations, and implications for health communication.

CHAPTER 2

THEORETICAL RATIONALE

The primary objective of this dissertation is to examine how *attitude accessibility* affects young adolescents' retention of anti-smoking messages. I define young adolescents as those 12- to 15-years-old. Based on theory and research, attitude accessibility should predict an individual's biased message processing, message elaboration, and *delayed unaided* recall of Public Service Announcements (PSAs). Therefore, this section will focus on those relationships by explicating a model of attitude accessibility and describing how attitude accessibility should affect biased message processing and message elaboration. The next section of this chapter provides a brief overview of the memory and message recall literatures and a rationale for why attitude accessibility should predict delayed unaided recall of messages. An argument that message bias and message elaboration are potential moderators of the attitude accessibility-unaided recall relationship is also forwarded. Finally, as two message types were used in this study, differences between those types are outlined and research is summarized.

Model of Attitude Accessibility

Historically the evaluation of an object, or valance of an attitude, has been important to persuasion research because it indicates whether attitude change or attitude reinforcement for the message advocacy is needed. Research since the early 1980s, however, provides evidence that how easily a person can express his/her opinion is also important to persuasion because it provides insight into the salience, prior knowledge, prior exposure to the issue. Ease of attitude retrieval, or attitude accessibility, is conceptually defined as how quickly or automatically the attitude can be activated (Fazio, 1990, 1995). An attitude is defined as the evaluation of an object

(e.g., positive or negative), so accessibility is the strength of the object-evaluation. Fazio et al. (1982) introduced the concept of attitude accessibility as an indication of attitude strength and argue that salient attitudes or attitudes formed from direct experience are more accessible (i.e., "stronger").

Taking our own attitudes into account, we can clearly identify differences among them. Some attitudes are easily expressed, others require time to reflect, others have not been formed to a point of agreement or disagreement, and still other objects have not been considered at all. This range of retrieval varies by attitude-object and by person. For example, some individuals have strong political identities (e.g., Republican, Democrat), others like to consider each political issue, and still others have little interest in political matters. The more easily an individual can discuss his/her political views, the more accessible the person's political attitude, regardless of the valence (i.e., positive or negative, for or against) of that attitude.

As attitude accessibility is the ease of object evaluation, it can be difficult to separate the concept from the measurement of it. Typically, attitude accessibility is measured by how long it takes an individual to respond to or evaluate an attitude-object (Fazio, 1990, 1995). The measurement of time varies in studies (e.g., seconds, milliseconds), but some measurement of response time has always been used. As this type of research began in the early 1980s, technological equipment was available to record time in some way. For example, in one of the first experiments to measure the accessibility of attitudes, Fazio and colleagues recorded participant response time to adjectives written on slides. Each slide was connected to an electronic clock in the next room that began to count in seconds as the participant read and thought about the words displayed. The clock was stopped when participants pushed a button on

a box labeled “yes” or pushed a button on another box labeled “no.” As soon as the next slide appeared, the clock began to count again (Fazio et al., 1982).

Important to this model of attitude accessibility is the assumption that pieces of information are stored in memory and linked to other similar pieces of information (Roskos-Ewoldsen, Arpan-Ralstin, & St. Pierre, 2002). This conceptualization is explicated more thoroughly in network models of memory (see Anderson, 1990), but attitude accessibility elaborates on the idea of associative links. According to attitude accessibility, attitudes are the associative memory links between a given object (i.e., topic, person, etc.) and the evaluation of that object (Fazio, 1990, 1995; Roskos-Ewoldsen & Fazio, 1992). This association can vary in strength and is represented as occurring on an attitude--non-attitude continuum (Fazio, Powell, & Williams, 1989; Fazio, Sanbonmatsu, Powell, & Kardes, 1986). On the one hand, an individual may have no knowledge or evaluation of the attitude object stored in his/her memory (non-attitude). On the other, an individual may have a strong association between the two, which leads to a greater chance of the attitude being accessed by the individual (i.e., more accessible attitude) (Roskos-Ewoldsen & Fazio, 1992).

The attitude-object evaluation relationship resulting in attitude accessibility has been demonstrated in several studies (Fazio, et al., 1982; Fazio, Powell, & Herr, 1983; Powell & Fazio, 1984; Roskos-Ewoldsen & Fazio, 1992). In the original test, Fazio and colleagues hypothesized that repeated expression of attitudes would increase the accessibility of those attitudes. In other words, they wanted to create or increase the accessibility of attitudes to particular objects. In this experiment, college students expressed attitudes (-5 = “extremely boring,” +5 = “extremely interesting”) about puzzle tests either one or three times prior to the response time measure of attitude accessibility. The mean response times of the two groups

(single expression or repeated expression) were significantly different in that those in the repeated expression condition had faster accessibility response times (Fazio, et al., 1982).

Building on these results, Powell and Fazio (1984) tested the attitude-object evaluation association by manipulating the strength of the association (i.e., attitude accessibility). College students were asked to express attitudes toward a particular object (i.e., topic) 0, 1, 3, or 6 times across 12 different topics (variety of social issues): the more often a participant expressed his or her attitudes before the accessibility measure, the greater the association between the attitude-object and its evaluation. As predicted, a significant main effect was found for the strength of the association between an attitude-object and the evaluation of it. The more often an attitude was expressed (i.e., the more often the participants evaluated the topic) the more quickly they were able to express it.

These studies highlight an important consideration whenever constructing persuasive messages. Regardless of attitude valance, exposure to the attitude-object will increase the accessibility of that attitude. That means anti-smoking messages can reinforce the *positive* smoking attitudes held by individuals, which is likely one of the reasons prevention efforts have been most successful with young adolescents. For example, Pfau and colleagues found 7th grade students have strong negative attitudes toward smoking but the strength of those attitudes diminishes during the school year. In their study, inoculation treatments were effective in at least delaying smoking initiation among adolescents with low self-esteem (Pfau, et al., 1992). Repeatedly exposing young adolescents to anti-smoking messages should increase the accessibility of smoking-related attitudes and result in attitude reinforcement, which is important to do when a majority still have negative smoking attitudes.

How attitude accessibility affects persuasion has been described via the following process: attitude accessibility influences if/how an individual pays attention to a message, which in turn influences how biased the message is perceived to be and how motivated the individual is to process the message, both of which influence behavior (Fazio, 1986). Later, Roskos-Ewoldsen (1997) added factors that may increase attitude accessibility: frequency of attitude activation, recency of attitude activation, and elaboration. Given that attitude accessibility has been shown to affect both perceptions of bias (Shen, et al., 2009) and message elaboration (Roskos-Ewoldsen, et al., 2002), I focus on the role of these variables in message retention and future recall. As attitude accessibility is based on network models of memory and messages associated with highly accessible objects and attitudes should increase the likelihood of that message being stored and recalled (discussed in more detail below, also see Higgins, 1996), I predict that attitude accessibility will have a direct influence on message retention and future recall. Following this prediction, I hypothesize that both perceptions of bias and message elaboration moderate attitude accessibility's influence on message retention and future recall. The moderating role of these two variables is also predicted because only high levels of perceived bias and message elaboration should impact the direct relationship. Thus, the next few sections will provide theoretical rationales and data supporting the contention that attitude accessibility affects perceptions of message bias and message elaboration. However, a brief description of attitude accessibility's impact on attention will be included first, since it is assumed to affect both biased message processing and message elaboration (see Fazio, 1986; Roskos-Ewoldsen, 1997).

Attitude Accessibility and Attention

Higher attitude accessibility of an attitude-object is likely to influence what stimuli or information an individual pays attention to regardless of attitude valance (Higgins, 1996;

Roskos-Ewoldsen, et al., 2002). Roskos-Ewoldsen and Fazio (1992) demonstrated this relationship in a series of studies. In one study, participants' attitude accessibility toward distracter items was manipulated such that one group made repeated evaluations of half of the distracter items while the other group made repeated evaluations of the other half of the distracter items. Directions for the second phase of the study told participants that the names of two target items would appear on the screen for 2 seconds before being replaced by a picture of six items. Each participant's task was to identify if one of the target items appeared in the picture of items as quickly as possible (yes/no response); distracter items could be found in three of the six spots. The authors found that participants with highly accessible distracter item attitudes took significantly longer to respond to the target question than those with less accessible distracter item attitudes (Roskos-Ewoldsen & Fazio, 1992). Bargh and Pratto (1986) have also found the accessibility of certain personality trait words (i.e., intelligence, rudeness) slows the speed with which participants can name colors when those personality trait words are also present.

This finding can be explained one of two ways. First, the highly accessible distracter items could have taken up cognitive capacity and slowed the reaction times down. Second, the highly accessible distracter items could have drawn some attention away from the primary task. That is, these words also drew the attention of those participants. This explanation makes sense for the rest of the model because it paying attention to a message makes biased message processing and message elaboration possible. Without a message first drawing attention, perceptions of a message will not be formed. In addition, attention also provides theoretical grounds for a direct attitude accessibility-message recall relationship that will be covered later in this chapter. I begin, however, by describing how attitude accessibility should affect perceptions of attitude-related messages.

Attitude Accessibility and Biased Message Processing

Fazio (1986) assumes attitudes function as part of a framework of cognitive structures through which individuals view and interpret messages. He states, therefore, that holding an attitude will guide perceptions and information processing about the attitude-object. That is, attitudes consistent with a message will result in a positive message bias and holding negative attitudes will result in a negative message bias. A positive bias would lead an individual to evaluate a message as stronger than its arguments really are, while a negative bias would lead an individual to discount the message. For example, Fazio and Williams (1999) asked individuals of voting age for opinions of presidential candidates (i.e., Reagan and Mondale) performances in the 1984 presidential debates. Reagan supporters viewed his performance more positively, but individuals with more highly accessible attitudes about Reagan only had slightly more positive attitudes than those who had less accessible attitudes about Reagan (low accessibility, $r = .47$, high accessibility, $r = .48$, n.s.). When both the presidential and vice-presidential debates were considered, still only taking into account presidential candidate opinions, significant results were obtained (low accessibility, $r = .40$, high accessibility, $r = .74$).

In both models of attitude accessibility (Fazio, 1986; Roskos-Ewoldsen, 1997), attitudes that are more accessible result in more selective information processing. More specifically, individuals select information from the message that is consistent with an already held attitude, which in turn influences evaluations of information or a message. In support of this claim, attitude accessibility has been found to moderate the relationship between the attitude-object and the individual's evaluation of the information presented about the attitude-object. In a study conducted by Houston and Fazio (1989), the authors found that college students with more accessible and positive attitudes toward capital punishment rated capital punishment more

favorably than those with less accessible and positive attitudes (low r = .13, high r = .54). In a second experiment presented in the same article, the authors established that attitude accessibility influenced biased processing by manipulating accessibility (college students either expressed an attitude toward the death penalty one or six times). Again, the correlations between attitude and attitude-object evaluation were significantly different for high and low accessibility participants (low r = .08, high r = .58). Other studies have found similar results supporting the argument that those with highly accessible attitudes are more likely to engage in biased message processing than those with less accessible attitudes (Houston & Fazio, 1989; Roskos-Ewoldsen, Bichsel, et al., 2002; Schuette & Fazio, 1995).

While both positive and negative biased processing occur, it is negative biased processing that has important implications for anti-smoking PSAs. Negative biased processing can lead to minimizing, avoiding, or denying the advocacy of the message (Roskos-Ewoldsen, Yu, & Rhodes, 2004; Ruiter, Verplanken, de Cremer, & Kok, 2004; Witte, 1992, 1994), and is thus the focus of this dissertation. Interested in attitude accessibility's impact on biased processing, Shen et al. (2009) turned to the theory of psychological reactance (Brehm & Brehm, 1981) to provide additional rationale. Messages that aim to change important attitudes, like those associated with smoking behavior, are more likely to elicit negative responses (i.e., minimizing) that lead to reactance and negative message processing. Using an adolescent population Shen and colleagues found highly accessible attitudes resulted in biased message processing when the advocacy of the health-related PSA was inconsistent with the pre-existing attitude. Specifically, for individuals with less accessible attitudes, the impact of attitude on biased message processing was non-significant. For individuals with more highly accessible attitudes, attitude predicted biased processing (Shen, et al., 2009). Therefore, this project expects to replicate this finding:

H1: Individuals with message inconsistent attitudes will engage in more biased message processing than those with message consistent attitudes, but only when attitude accessibility is high.

Attitude Accessibility and Message Elaboration

Attitude accessibility also affects message elaboration or how much one thinks about a message or the topic of that message (Fazio, 1986; Roskos-Ewoldsen, 1997). Petty and Cacioppo (1986) suggest elaboration is based not only on an individual's ability to assess the message, but also on his or her motivation (i.e., the topic's relevance to the individual). If both motivation and ability are high, the authors claim the individual will engage in more elaborative processing, which is predicted to result in longer lasting attitude change.

Attitude accessibility, therefore, could influence message elaboration either through an individual's motivation or through his/her ability to analyze the message information. Fabrigar, Priester, Petty, and Wegener (1998) provided the rationales for both routes to persuasion. The first explanation assumes attitude accessibility determines how *relevant* the attitude-object is to the individual. Increases in attitude accessibility (i.e., frequent presentation of the attitude-object) lead to increases in perceived importance. As evidence, studies have found moderate and significant correlations between attitude accessibility and attitude importance. In these studies, attitude importance is similar to attitude evaluation in that more important attitudes were hypothesized to be more accessible. Unlike the studies by Fazio and colleagues, importance was not manipulated through repeated evaluation; rather, attitude accessibility and attitude importance were measured simultaneously. Krosnick (1989) reported correlations between attitude response times (in seconds) and attitude importance across different topics (women's rights, abortion, race, and defense spending) in two studies. In the first study attitude importance

and response time correlations were all significant and negative (women's rights, r = -.29, abortion, r = -.31, racial integration, r = -.20), indicating that those who rated the topic as more important responded faster. In the second study, the same pattern of correlations between attitude response time and attitude importance were found (defense spending, r -.25, and abortion, -.26). Similarly, Roese and Olson (1994) found shorter response times are positively and significantly correlated with attitude importance. Attitude accessibility as a measure of attitude importance provides another argument for applying this model to this population. Adults could have both attitudes and behavior influencing their message perceptions, but smoking behavior among young adolescents is low in comparison. For a majority of young adolescents, the importance of their attitude toward smoking will strongly influence their message perceptions.

The second explanation provided by Fabrigar and colleagues suggests that attitude accessibility is related to relevant knowledge about the attitude-object; as amount of knowledge increases, attitude accessibility increases. Fabrigar et al. (1998) claim the two studies presented in the article are evidence of attitude accessibility's impact on message elaboration. However, they manipulated message elaboration through argument quality (strong vs. weak) instead of providing a measure of message elaboration. They based this procedure on the assumption that low attitude accessibility would lead to little message elaboration, which would mean those individuals would be only slightly influenced by the quality of the argument. Their hypotheses did receive support; when attitude accessibility was low, there was no significant difference between argument quality (strong m = 3.13, weak m = 3.72). However, when attitude accessibility was high a significant difference was found (strong m = 2.50, weak m = 3.81).

Roskos-Ewoldsen, Bichsel et al. (2002) have also reported results that support attitude accessibility's relationship with message elaboration. The attitude accessibility of college

students was manipulated through repeated response to relevant attitude items. After exposure to an argument, students listed all of their thoughts about the message. While attitude accessibility did not have an impact on the number of positive comments (likely because messages featured Neil Armstrong advocating for a toxic waste dump, so positive comments would not be expected), participants with lower attitude accessibility did list fewer negative comments. Listing fewer negative comments suggests the students did not think about the message as much as those with higher levels of attitude accessibility who wrote more negative comments. Similar to Fabrigar et al. (1998), their results support the hypothesis that higher attitude accessibility leads to more message elaboration. As the goal of health messages is to encourage predominately positive thoughts about the message advocacy, it will be the focus of this dissertation. Therefore,

> *H2:* Individuals with message consistent attitudes will engage in more message elaboration than those with message inconsistent attitudes, but only when attitude accessibility is high.

Race, Gender and Message Perceptions

Prior research on message perceptions and processing provides mixed results on whether gender and race differences exit. In a meta-analysis of fear appeal research, which many health-related messages are, Witte and Allen (2000) found few gender and race differences. However, a review of advertising literature published around the same time specifically focused on the differences found between men and women's information processing (see Putrevu, 2001). As an individual's culture and life experiences impact attitudes, it is likely these demographic differences are found for some topics and not others. Research on smoking attitudes suggests this is a topic where differences may exist. For example, African American adolescents have more negative smoking-related attitudes than adolescents of other races/ethnicities (Clark, Scarisbrick-

Hauser, Gautam, & Wirk, 1999; Taylor et al., 1999). In addition, Shen et al. (2009) found both gender and race differences. Male adolescents perceived PSAs as more biased than female adolescents; White adolescents perceived PSAs as more biased than African American adolescents. Therefore, gender and race will be included in analyses as differences may exist.

Attitude Accessibility and Young Adolescents

Very few attitude accessibility studies have been conducted with populations other than college students or adults. In fact, all but one (see Shen et al., 2009) was conducted with participants at least 18 years of age. As will be demonstrated in the following section, young adolescents are a population that should be included in attitude accessibility research because research examining memory and information retention demonstrate important developmental differences among age groups.

Recall of Mediated Messages

While the hypotheses above examine how attitude accessibility affects perceptions of message bias and message elaboration, the critical dependent measure of this dissertation is message recall. Thus, this section provides a brief discussion of memory processes and attitude accessibility's relationship to memory. Second, different types of recall are described and an argument for examining *unaided recall* is forwarded. Third, a review of how message recall likely differs as a function of age (e.g., comparing younger and older adolescents) is provided. Finally, rationale for hypotheses linking (a) attitude accessibility and unaided recall, (b) message bias and unaided recall, and (c) message elaboration and unaided recall are presented.

Memory

Conceptually, memory is a complex network of systems working together and is conceived of as one's ability to store, retain and recall information (Lang, 2000; Neath &

Surprenant, 2005). Researchers often distinguish between working (or short-term or temporary) and long-term memories. Working memory plays an important role in cognitive tasks, while long-term memory is primarily used as storage for experiences and information learned (Baddeley, 1998). The main difference between these two memories is storage capacity. Estimates of storage life length in working memory are only a few seconds while long-term memory seems to have no limit (Cowan, 1988). The present dissertation examines young adolescents' long-term memory for mediated health messages, since memory was assessed 12 weeks after message exposure.

Most theories of memory assume that memory is multidimensional, comprised of several systems working together (Baddeley, 1998; Neath & Surprenant, 2005). Memory, in the large sense, is comprised of three systems that explain not only the mechanics of memory, but also how the senses, working memory, and long-term memory work together. *Encoding* occurs when an individual is exposed to new information and includes that person's initial evaluation or processing (Neath & Suprenant, 2005). Salience plays a role at this phase because not all aspects of a message or all information will receive equal amounts of attention (Higgins, 1996). As discussed above, information for which an individual has a highly accessible attitude is more likely to draw attention than information attached to a less accessible attitude. Similarly, in Lang's Limited Capacity Model of Mediated Message Processing (LC3MP, 2000), *encoding* refers to the immediate processing of a message; that is, how much information the viewer initially gained from a message. For example, if an individual is able to describe the spokesperson and advocacy of the message immediately after exposure, that information is considered encoded. The LC3MP describes the sub-processes of encoding that involve both exposure to the message and paying attention to it, but neither process guarantees encoding will

take place. Memory researchers assume that the encoding process results in a representation of the message, not a complete replica of the original message (Lang, 2000).

Storage is typically agreed upon to be the maintenance of information that has been encoded (Neath & Surprenant, 2005). It is also described as the linking of encoded information to information that has been reactivated in working memory (Lang, 2000; see Cowan, 1988 for a discussion of a similar process). The storage process assumes that the more links that can be made between new and old information, the more completely the new information will be stored. Research demonstrates that not all encoded information is treated equally; some information will likely be better stored (Lang, 2000). What information is stored depends on the individual and the topic. For example, a piece of salient information has a higher chance of being stored. The concepts of accessibility and salience sometimes overlap in the literature, or are even used as synonyms, yet Higgins (1996) argues the two are separate constructs. Accessibility is used to describe the retrieval of stored information, while salience should be used to describe the selective attention that occurs because of properties of the object/information/message. Therefore, the information that is given storage preference will be whatever seems most relevant to information the individual already has stored on a given issue. For example, when viewing a health-related PSA, one individual may find the spokesperson most relevant (e.g., a celebrity) while another may find the argument (e.g., smoking causes lung cancer) most relevant. Perhaps the first individual notices that his/her favorite celebrity is the spokesperson, while the second individual focuses on the topic because of a relative's death because of that health issue. These two people would not only store information differently, but would also store different information. As such, what is accessible to each individual at a later time will differ.

Finally, *retrieval* is conceptualized as the access and use of stored information (Lang, 2000; Neath & Surprenant, 2005). As such, it occurs when an individual locates a specific piece of information in storage and returns it (temporarily) to working memory. More completely stored information leads to more accessible information (Lang, 2000). Models of attitude accessibility and theories of memory share the assumption that the more links or the more often information is retrieved from memory, the more easily an individual will be able to access it.

In summary, memory is conceived of as the ability to store, retain and recall information. Importantly, research has demonstrated that such processes differ across age groups and thus, a review of memory research for young adolescents is critical to form appropriate hypotheses.

Young Adolescents

Unfortunately, not much memory or message recall research focuses on young adolescents (ages 12 to 15). Developmental psychologists are typically interested in young children (aged 4 to 6), while scholars interested in memory and aging focus on the mid and senior adult years. However, there have been a few studies that examine a larger age range to identify differences or make comparisons of memory processes and recall ability.

Gathercole and colleagues provide a model of working memory and its development from 4 to 15-years-old; finding that the basic information encoding structure is present by age 6. Importantly, significant changes in memory capacity occurred at each age group; for example 13 to 15-year-olds have a greater memory capacity than 10 to 11-year-olds (Gathercole, et al., 2004). Outside of particular models of memory, a consistent increase in memory capacity from young childhood to young and late adolescence has been found (Case, et al., 1982; Hulme, et al., 1984; Siegel, 1994). A similar trend of memory capacity growth has also found from young adolescence into adulthood. For example, Swanson (1999) compared several different age

groups (ages 6, 8, 10, 13, 16, 24, 35, 45, and 57) and found one's overall encoding capacity increases until approximately 45 years of age, which is when a slight decline begins.

Thus, young adolescents do not have the same capacity to remember PSAs as older populations. This difference is important to consider, as an individual's ability (at any age) to remember a message or information is important as knowledge is needed to prevent or change behaviors. For smoking prevention messages that are meant for young adolescents, examining their message retention is important to understanding an aspect of the effectiveness of those messages.

This dissertation examines young adolescents' memory for anti-smoking PSAs to understand how attitude accessibility, message perceptions and message type affect recall of these PSAs. Memory for information or messages can be assessed several ways, so a discussion of message recall is provided in the next section along with an explanation of the measure chosen for this project.

Message Recall

Message recall is a measure of what is retained from a message. Message recall is both conceptually and operationally defined at least three distinct ways: recognition, aided recall, and unaided recall. Each type of recall is theoretically linked to a different aspect of memory. These measures are typically used to assess whether, as well as how well, a message was encoded and stored, and how retrievable it is.

Recognition recall is most closely related to encoding; and more specifically, is used to determine whether specific parts or information of a message were encoded. It involves either presenting the individual with several options and asking him/her to pick out the previously learned/viewed information or simply asking the individual if she or he has seen the

information/message before (Zechmeister & Nyber, 1982). Measurement sensitivity refers to the measures ability to assess the amount of information that has been stored in memory. Recognition recall is considered the most sensitive measure of the varying degrees of memory because the individual is presented with several clues to help him/her access the requested information (Lang, 2000). Many studies, for example, ask participants if they have previously seen the message(s) or something like it. Wells (2000) makes a compelling argument based on a meta-analysis that recognition recall should not be considered a measure of memory because it does not result in the same decline that long-term memory typically shows (also see Appel & Blum, 1961; Lucas, 1960; Marder & David, 1961).

Aided and unaided recall are assessments of memory that are typically differentiated by cue strength. An individual accesses his/her memory after being presented with a cue(s), which range from strong to weak (Neath & Surprenant, 2005; Thomson & Tulving, 1970). A strong or *aided* cue may be several clues to help an individual access the requested information (Nelson, 1979). A strong cue provides a more sensitive measure of memory than a weak cue because it results in the desired target a majority of the time (Neath & Surprenant, 2005). A weak or *unaided* cue is more ambiguous about the exact information being requested, naturally resulting in less information retrieved than does either recognition recall or aided recall (Neath & Surprenant, 2005).

Thus, one might assume that aided recall results in better information retrieval than unaided recall; however, Tulving (1983) argues that it is how information is encoded that really determines whether an aided or unaided cue will result in better recollection. As new information is encoded, it is linked via retrieval to previously stored (and judged related) information (Neath & Suprenant, 2005). Therefore, how and what information of a message is encoded and linked to

other stored information will partially determine which type of cue will work best. This process has been demonstrated in studies that manipulate cue strength and find circumstances when weak cues result in more successful word retrieval than strong cues (Tulving, 1983; Watkins & Tulving, 1975), and show the impact of contextual factors (i.e., environment, emotions, unrelated thoughts) on recall (Raaijmakers & Shiffrin, 1981). For example, Rice (1992) found that affective or feeling messages perform poorer on unaided recall tasks. Other work shows that aided recall of advertising messages is affected by message attractiveness (Wells, 1964) and message length and repetition (Singh & Rothschild, 1983), whereas unaided recall is affected by message involvement (Zinkhan, Locander, & Leigh, 1986) and the meaningfulness of the message (Haley & Baldinger, 1991).

The amount of time between exposure and recall may also influence which type of cue will work best. For example, Everett and Palmgreen (1995) used both unaided, given first, and aided cues to assess message retention. The authors report similar results for both cues; that is, participants recalled the same amount of information regardless of cue type. However, Everett and Palmgreen assessed recall immediately message exposure. This finding suggests that immediately after message exposure the type of recall cue used may not matter as much as when a greater length of time occurs.

Some researchers suggest aided recall can be a sufficient indicator of message awareness in low-involvement situations, whereas unaided recall is useful to gauge message effects in high-involvement situations (e.g., Greenwald & Leavitt, 1984). Overall, memory researchers assume deep processing leads to better unaided recall than does shallow processing (Hyde & Jenkins, 1973; Neath & Surprenant, 2005), suggesting that unaided recall may serve as a better indicator of processing depth. Similarly, Lang (2000) argues unaided recall is a better indicator of

elaborative processing of messages. Shiffrin and Schneider (1977) argue that for unaided recall to be successful, it requires that the individual has processed and rehearsed the information at a deep, elaborative level and that the information has been organized so that a general cue allows access to it in memory (Lynch & Srull, 1982). Aided recall, however, may be possible if the stimulus is processed and rehearsed at a shallow, sensory level (Rossiter & Percy, 1983).

Differences between aided and unaided recall have also been detailed in terms of memory and learning. In this context, aided recall is considered the basic measure of associative memory. For information that is not easily *accessible*, aided recall may provide the individual with the cue necessary to retrieve it (Raaijmakers & Shiffrin, 1992; Tulving & Pearlstone, 1966). Thinking of our own memory processes can help make this argument clearer: Many times we know the information we are trying to recall, but are unable to do so easily or sometimes at all (i.e., a celebrity's name or movie title). In other words, availability is necessary for accessibility, but does not ensure it (see also, Higgins, 1996). Unaided recall, on the other hand, encourages the individual to use a number of different retrieval strategies. This process may not result in all information *available* in memory, but should result in accessible information being retrieved. Raaijmakers and Shiffrin (1992) also argue unaided recall is more akin to how people remember things in "real-life" situations. Therefore, in this dissertation, I examine unaided recall of messages because this measure of information retention more likely taps into deeper processing and rehearsal of messages, and is likely a measure of accessible (and not just available) information.

Attitude Accessibility and Message Retention

How information is encoded and stored has implications for the attitude-object relationship because according to associative network models of memory, perceived similar

objects or information will be linked together. Therefore, if new information (learned from the message) is not linked to an accessible attitude-object, retrieving that information in the future may be more difficult. Higgins (1996) argues that information related to highly accessible objects will receive more attention than less accessible objects; therefore increasing the likelihood that the information related to highly accessible objects will be stored and recalled. Therefore, attitude accessibility should directly affect message retention because information about a highly accessible object should be linked in memory to that object.

The work of Fazio and colleagues provides supporting evidence, linking attitude accessibility and object accessibility together. For example, in the initial experiment on attitude accessibility and attention conducted by Roskos-Ewoldsen and Fazio (1992), a significant correlation between the items noticed and the participants' familiarity ranking of those items was found. In addition, attitude response scores were faster for objects that the participant could immediately recall without aid. While the final experiment in the series demonstrated the direct influence of attitude accessibility on attention, this initial experiment suggests that more accessible objects are correlated with more accessible attitudes. Based on this study, research has been conducted on attitude accessibility's influence on object categorization. For example, if an individual has a highly accessible attitude about Southerners, encountering a Southern woman would likely cause that individual to categorize that person as Southern (as opposed to a woman) and focus on that aspect of the individual. Smith and colleagues found that individuals were more likely to categorize objects by the categories for which they had highly accessible attitudes (Smith, Fazio, & Cejka, 1996).

Although these studies were conducted with adult populations, they provide support for the hypothesized direct influence of attitude accessibility on message retention. Individuals will

direct their attention toward objects for which they have a highly accessible attitude, thus making the attitude-object and similarly linked information more accessible. As is found in conceptualizations of both attitude accessibility and memory, the more accessible information is, the more likely it is retrieved in the future.

While little work has linked attitude accessibility and message retention, researchers have examined *immediate recall* and thus, that is the literature reviewed here. For example, Higgins, King and Mavin (1982) examined the influence that personality traits, high and low in accessibility, had on individuals' recall of a description of another student. Personality traits considered high in accessibility were ones that an individual used a minimum of three times to describe him or herself and six friends. A week after accessibility of personality traits were assessed, participants were given an essay that described another college student. The essay contained personality trait words that were highly accessible for half of the participants, but words that the other students had not previously used to describe themselves or friends. Ten minutes after having read the essay, participants were asked to rewrite the essay verbatim and describe the type of person they thought the essay described. In both their reproductions of the essay and descriptions of the essay subject, participants were significantly more likely to leave out personality trait descriptors that were less accessible to them than were those higher in accessibility (Higgins, King, & Mavin, 1982).

Roskos-Ewoldsen and Fazio (1992), in a test of immediate recall examined participants' recall of items they were asked to intentionally ignore rather than give their attention to. Each participant first evaluated 108 items. It was at this time that their attitude accessibility was manipulated as some participants rated some of the items more than once. After the item evaluations were complete, participants were then asked to identify whether an object in the

middle of a computer screen was a letter or a number. Surrounding each letter/number were 6 pictures that were meant to distract the participants from making quick judgments. Participants were specifically told to ignore the distracter items as best they could and each screen was displayed for a total of 2 seconds. Once this portion of the experiment was complete, participants were then given a surprise unaided recall task. They were asked to list as many of the distracter items as they could and were given as much time as they needed; items that were highly accessible were recalled significantly more often than were those that were less accessible (Roskos-Ewoldsen & Fazio, 1992).

In addition, Nedungadi (1990) conducted a study about product brands that also provides support for the attitude accessibility-unaided recall relationship. College students were divided into five groups. Four groups were primed for a particular brand (2 major brands, 2 minor brands) and 1 group received no prime. Attitude accessibility was manipulated through the use of major and minor brands, as well as through brand priming. Participants were primed by being presented with neutral statements about the target brand like "McDonalds has adequate seating capacity." Participants in the primed groups responded to 12 of these statements about four brands (only one was the target) and participants in the not primed group responded to 9 statements about three brands (none were target brands). After completing these statements, participants were given a specific situation and asked to identify which brand they would choose (not provided a list). They were then given 2 minutes to recall any brands they could from that product group. Significant results were reported for the direct effects of priming for three of the four brands. No significant results were found for the most recognizable brand, but the author hypothesized it was because the most recognizable brand had the least to gain from priming. That is, it was already as accessible as it would be. While research has focused almost

exclusively on short term recall and has been conducted with college students or adults, there are consistent findings linking attitude accessibility to greater recall of attitude consistent information.

Interested in racial prejudice, Fazio and Dunton (1997) used attitude accessibility and valance of attitude toward African Americans to predict future racial categorization. The authors found individuals with more highly accessible negative attitudes toward African Americans were more likely to categorize an African American individual by race in the future. Thus, both the accessibility and valance of attitudes influenced future categorization retrieval and use. Similar results can be expected of individuals with anti-smoking attitudes. Individuals with highly accessible anti-smoking attitudes will be more likely to pay attention to the message and link it to existing information, increasing the likelihood of future message recall. However, if the information in the message and is not consistent with the individual's attitude, less message recall can be expected. Therefore,

H3: Individuals with message consistent attitudes will accurately recall more messages than those with message inconstant attitudes, but only when attitude accessibility is high.

Potential Moderators of the Attitude Accessibility-Message Retention Relationship

While it is hypothesized above that attitude accessibility affects perceptions of biased message processing, message elaboration, and unaided recall, another question this dissertation seeks to answer is whether biased message processing and/or message elaboration moderate the relationship between attitude accessibility and delayed unaided recall. Those relationships are examined in the next section.

Biased message processing and message retention. As previously discussed, biased message processing can occur whether an individual's attitude is consistent or inconsistent with

the message advocacy. Individuals select out information to process based on their currently held attitude, which can result in a positive bias (e.g., viewing the argument of a message as stronger than the evidence suggests) or a negative bias (e.g., viewing a message source as biased and perceiving the message argument to be invalid). This project specifically focuses on negative bias as such biases would work against the persuasive impact health communicators are trying to make and because young adolescents are known to be resistant to anti-smoking messages (Grandpre, Alvaro, Burgoon, Miller, & Hall, 2003). If an adolescent perceives a message to be biased, s/he may engage in selective information processing (see Houston & Fazio, 1989) which could lead to negative cognitions about the message. Selection information processing should in turn lead to poorer recall as their reaction may be to minimize the message (i.e., selective retention). Details of the message would likely be lost, even if the adolescent remembers seeing an anti-smoking PSA. Therefore,

H4: Biased message processing and unaided recall for a message are negatively associated; as biased message processing increases, unaided message recall will decrease.

As previously hypothesized, both accessibility and valance should impact perceptions of message bias. However, as attitude accessibility and biased processing should predict delayed unaided recall, it is likely biased processing moderates the relationship. Based on previous hypotheses, only when both variables are high should the moderating effect be present. Therefore, the following prediction is made:

H5: Individuals with high attitude accessibility and high levels of biased processing will accurately recall fewer messages.

Message elaboration and message retention. As previously hypothesized, individuals with more accessible smoking attitudes should engage in more message elaboration than those

with less accessible smoking attitudes (regardless of valence); possibly because of ability or motivation. It has also been hypothesized that those with highly accessible message advocacy consistent attitudes will engage in more elaboration than those with highly accessible message advocacy inconsistent attitudes for similar reasons. Therefore, it seems logical to conclude that individuals who engage in more message elaboration would recall more messages than those who engaged in less elaboration, simply because they should have processed and rehearsed the messages at a deeper level (see Lang, 2000).

H6: Message elaboration and unaided message recall are positively associated; as message elaboration increases, unaided message recall will increase.

As previously hypothesized, both attitude accessibility and valance should also impact message elaboration. Again, as both attitude accessibility and message elaboration should influence delayed unaided recall, message elaboration likely moderates the relationship. Based on previous hypotheses, only when both variables are high should the moderating effect be present. Therefore, the following prediction is made:

H7: Individuals with high attitude accessibility and high levels of message elaboration will accurately recall more messages.

In summary, the proposed dissertation tests the relationships illustrated in Figure 2.1.

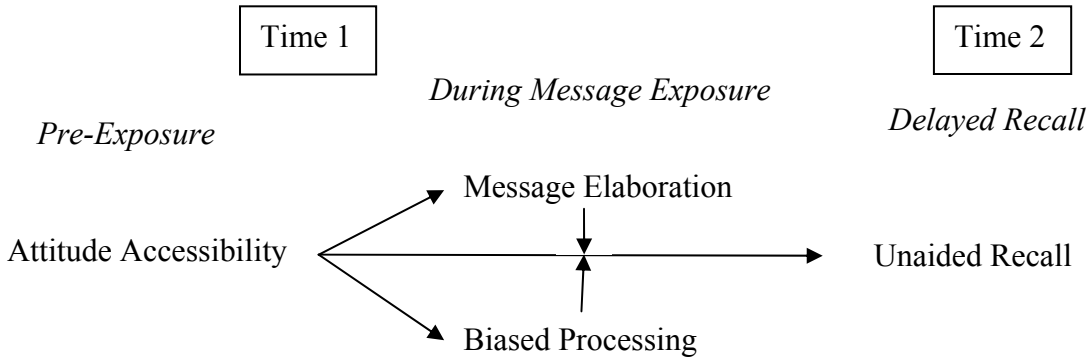

Figure 2.1: Proposed model.

All hypotheses, expect the two involving message type and recall, are presented in Table 2.1.

Table 2.1

Attitude Accessibility and Message Recall Hypotheses

H1: Individuals with message inconsistent attitudes will engage in more biased message processing than those with message consistent attitudes, but only when attitude accessibility is high.
H2: Individuals with message consistent attitudes will engage in more message elaboration than those with message inconsistent attitudes, but only when attitude accessibility is high.
H3: Individuals with message consistent attitudes will accurately recall more messages than those with message inconstant attitudes, but only when attitude accessibility is high.
H4: Biased message processing and unaided recall for a message are negatively associated; as biased message processing increases, unaided message recall will decrease.
H5: Individuals with high attitude accessibility and high levels of biased processing will accurately recall fewer messages.
H6: Message elaboration and unaided message recall are positively associated; as message elaboration increases, unaided message recall will increase.
H7: Individuals with high attitude accessibility and high levels of message elaboration will accurately recall more messages.

Message Type and Unaided Recall

Thus far, predictions have been about anti-smoking messages in general; not specifying type of anti-smoking message. Yet, Tulving's (1983) work suggests that context and factors such as message type influence the encoding and storage processes, which in turn influence what

information is easily accessible. The type of message, and/or what features are present in a message, can influence not only what information is encoded into memory but also what other information it links to.

Several studies have examined which features or message types increase message recall, and ultimately attitude and/or behavior change (Biener & Siegel, 2000; Farrelly, et al., 2002; Goldman & Glantz, 1998; Grandpre, et al., 2003; Johnston, Terry-McElrath, O'Malley, & Wakefield, 2005; Niederdeppe, 2005; Niederdeppe, Davis, Mathew, & Yarsevich, 2007; Pechmann, Guangzhi, Goldberg, & Reibling, 2003; Reeves, Newhagen, Maibach, Basil, & Kurz, 1991). Anti-smoking messages are often given a label that describes their goal or structure. For example, these message may be informative (to provide information), anti-industry (to discredit the tobacco industry or expose wrong doings), or second-hand smoke (discourage smoking around others or being around others while they smoke) to name just a few. In this dissertation, I examined two different types of messages distinguished by the message structure: personal testimony (PT) and second-half punch (SHP). PT messages are those that focus on current or former smokers sharing their negative experiences/consequences related to smoking cigarettes. SHP messages are those that include a surprise or twist ending; moreover, the SHP messages used in this dissertation were not clear about their health advocacy until the last 3-5 seconds of the 30-second messages. These two message types were chosen as both have been successful with adolescent populations and this topic, which is discussed in more detail below. Given the purpose of health-related PSAs is to inform or persuade the intended audience concerning a health issue; I specifically examine how message type can affect long-term retention of health-related information.

Message research often focuses on message features: both content and structural. Content features of a message include the story (such as the topic or type of message), the plot, and characters (Lang, 2000; Stephenson & Palmgreen, 2001). Structural features include the stylistic features of the message like edits and cuts, camera movement, pacing, sound effects, and music (Geiger & Reeves, 1993; Lang, 2000). While viewers can actively control their attention to mediated messages based on content features, structural features of messages are hypothesized to engage attention on an unconscious level (Lang, 2000; Morgan, Palmgreen, Stephenson, Hoyle, & Lorch, 2003).

Specifically interested in structural features, Niederdeppe et al. (2007) report that second-half punch is a message feature that increased *aided* recall of anti-smoking PSAs among adolescents 12 to 17 years old. The study used the responses from the Legacy Media Tracking Surveys, a national random-digit-dial telephone survey, conducted between 1999 and 2003. These data suggest the surprise or twist ending was memorable to adolescents; although given that only aided recall was measured, these data reflect that the SHP messages were encoded but does not provide strong evidence of their accessibility. Moreover, using a similar design, Niederdeppe (2005) found that PSAs with a second-half punch component increased message elaboration *only* in older teens (aged 16-18); no difference among message features was found for younger teens (aged 12-15). Thus, there is limited information on the accessibility of information learned from second-half punch messages.

Data for personal testimony (PT) messages is stronger. PT messages are a type of narrative (see Labov, 1974) and narratives are thought to be easily processed and retained as the basic structure of communication is narrative (Ferrell, 1985; Fisher, 1985). Such messages are also considered effective against resistance, which is important whenever interested in adolescent

populations because they are theorized to reduce biased processing and allow for identification with message characters (Cin, Zanna, & Fong, 2004). Narrative messages have also been found to affect behavioral intention (Greene & Brinn, 2003) and result in belief changes that last at least a week (Stitt & Nabi, 2009). Importantly, research supports the conclusion that narrative messages are memorable and persuasive; and have been successfully recalled by aided and unaided means (Borgida & Nisbett, 1977; Graesser, 1981; Kazoleas, 1993; Koballa, 1986; Lang, 1989; Lang & Newhagen, 1996; Lang, Sias, Chantrill, & Burek, 1995; Reinard, 1988; Taylor & Thompson, 1982). Thus, while the cumulative evidence suggests that both PT and SHP message types may be remembered by young adolescents, evidence for PT or narratives is much stronger as narrative message structures have been studied more often and in a variety of contexts. Importantly, narrative messages have been tested for message retention using both aided and unaided recall, while SHP message studies have only used aided recall. Because this dissertation is interested in the accessibility of information and not just availability, unaided recall provides a better assessment of the memorability of messages. Therefore,

H8: Accurate unaided message recall will be higher for PT messages than for SHP messages.

There is also a possibility that young adolescents may perceive SHP messages as confusing, unclear or ambiguous. The three SHP messages utilized in this dissertation not only have a surprise ending, but importantly, none of the messages were clearly about smoking cigarettes until the last few seconds of the PSA. Message ambiguity can affect how much message elaboration an individual engages in. The bias hypothesis states that an unclear/ ambiguous message can lead an individual to process *components* of a message, rather than the information present, even if the individual is highly motivated (Chaiken, et al., 1989). For

example, people may decide they have an attitude consistent with the message advocacy because they trust the sponsoring organization.

Ambiguity thus influences what information the individual selects to process. In support, Chaiken and Maheswaran (1994) found participants provided more object attribute related thoughts and evaluations when messages were unambiguous. In addition, source credibility significantly and positively influenced object evaluations after an ambiguous message. Finally, in an analysis of adolescent responses to the American Legacy Foundation truth campaign, Rhodes and colleagues found the PSAs invoked anger toward the tobacco industry. While this response was effective at changing attitudes toward the tobacco industry, attitudes toward the tobacco industry were not related to changes in attitudes about smoking (Rhodes, Roskos-Ewoldsen, Eno, & Monahan, 2009). Because of the surprise component of SHP messages, young adolescents may focus on components of the messages (e.g., remembering the surprise) rather than the central theme (health advocacy) of the message. Therefore, the critical health advocacy of the PT messages will be better recalled than the health advocacy of the SHP messages. Thus,

H9: Accurate health advocacy recall will be higher for PT messages than for SHP messages.

Differences in message type recall could have important health communication and public health implications. If PT messages are recalled more frequently than SHP messages by young adolescents, it would suggest that some campaign efforts are not wisely utilizing resources. Efforts to create interesting, flashy messages may not have the same impact that traditional narratives do, making this trend to market public health like commercial products a wasteful strategy. Individual health is, after all, not the same as choosing a brand of MP3 player. The ineffectiveness of SHP messages would be particularly evident if their health advocacies are

not recalled as frequently as PT health advocacies. Remembering the advocacy of the message is much more important than remembering any characters or action in the message or even *liking* the message.

Conclusion

Although the ultimate goal of a mediated health message or campaign is typically behavior change (see Snyder, 2001), understanding the routes to behavior change (i.e., awareness, knowledge, attitude change) is important because it often takes several messages to reach the desired behavioral outcome. As several scholars have argued and demonstrated, tailoring messages is important in achieving these results (Brug, Campbell, & van Assema, 1999; Cawsey, Jones, & Pearson, 2000; De Vries & Brug, 1999; Kreuter, Bull, Clark, & Oswald, 1999; Prochaska, DiClemente, Velicer, & Rossi, 1993). Many anti-smoking campaigns, like the truth campaign, are meant for young adolescent audiences and typically aimed at preventing cigarette use. Given that deeper elaboration of message content and message retention are assumed to lead to stronger suasory effects (Niederdeppe et al., 2007; Petty & Cacioppo, 1986) it is critical that we understand how young adolescents recall anti-smoking messages. Evidence suggests a young adolescent's information retention abilities may not be as sophisticated as the older teen and young adult populations these messages are usually tested on. Given that the majority of attitude accessibility studies are conducted with college students and the tendency in message research to test either immediate unaided recall or delayed aided recall, it is important to understand the mechanisms that affect long-term message retention for young adolescents. It may be that a young adolescent's message perception at the time of message exposure only provides part of the picture. Also important is what they can do with that encoded information – how much of it is stored, what other information it is linked to, and how accessible/retrievable it is in the future as

information that is not easily retrievable is not as likely to impact behavior (see Fazio, 1986; Roskos-Ewoldsen, 1997).

Based on the attitude accessibility model, it is proposed that attitude accessibility will predict the message elaboration, biased message processing, and delayed unaided recall of young adolescents. Both message elaboration and biased message processing may moderate the attitude accessibility-unaided recall relationship. Finally, message type should affect unaided recall and most importantly recall of the health advocacy aspect of the message. Chapter 3 details the measures used for each variable and outlines the field experiment method used to study the hypotheses.

CHAPTER 3

METHOD

Design

A 2 (Gender) X 2 (Race: African American vs. White) x 2 (Condition: viewed personal testimony vs. second-half punch messages) x 3 (Message Order: nested within condition) mixed design was used. The first two factors were measured, participants were randomly assigned to view either personal testimony (PT) or second-half punch (SHP) messages, and within condition, the order participants viewed three messages was also random. Participants evaluated each message immediately after viewing it.

Participants

Participants (N = 244) were low-income ninth grade students attending six rural high schools in Georgia. Part of a larger grant project on adolescent perceptions of anti-smoking PSAs, two criteria were used to select the high schools from which the participants were recruited. First, schools were selected to ensure a relatively equal amount of African American and White students could participate (data taken from Georgia Department of Education, 2007), which would allow for within-school comparisons if needed. Second, the schools had to be located in low-income areas. To meet this criterion, at least 40% of the students attending the school had to qualify for the free lunch program; most schools chosen had 50% of the students or more eligible. The 2007 median household income for the county each school was located in was also a selection criterion; selected sites ranged from $26,223 to $43,514 (U.S. Department of Agriculture [USDA], 2008). Table 3.1 presents the selection criteria information for each high school; names of schools and counties are not provided to protect anonymity. Finally, rural

counties were primarily examined as low-income, rural, Southern adolescents are known to have a higher than average smoking rate (e.g., Atav & Spencer, 2002; Sarvela, Cronk, & Isberner, 1997).

Table 3.1

High School Selection Criteria by School

High School	2007 Percent of White Students	2007 Percent of African American Students	2008 Median Household Income (County)	2007 Percent of Qualified Students for Free Lunch Program (High School)
School 1	43%	55%	$35,566	52%
School 2	24%	74%	$35,566	73%
School 3	50%	48%	$30,236	66%
School 4	80%	16%	$34,718	51%
School 5	76%	20%	$43,823	40%
School 6	72%	26%	$39,593	41%

Note: The 2007 median household income data by county could no longer be accessed on the USDA's Web site, so the 2008 numbers (when data collection was taking place) are reported instead.

Of the total participants, approximately 61.1% were female and 38.9% were male. Self reported ages were as follows: 0.8% were 13 years old, 32.4% were 14, 57.8% were 15, and 9.0% were 16 years old. The mean age was 14.75 years (median = 15, *s.d.* = .06); not surprising as only enrolled 9th graders were recruited. As the standard deviation suggests a limited age range, age was not included in the analyses. Participants who reported being multiracial and listed either African American or White as one of their racial groups were counted as belonging to that racial group. Of the participants, 49.2% reported African heritage and 47.5% reported White heritage; 3.3 % did not report. The table below (Table 3.2) illustrates the sample had more

females than males and African American females outnumber African American males almost two to one.

Table 3.2

Participant Gender and Ethnicity: Phase II

	Race	
Gender	African American	White
Female	32.4% (79)	27.0% (66)
Male	16.8% (41)	20.5% (50)
Subtotal (n)	120	116

Note: Number of participants per cell is reported in parentheses.

Message Type

Participants were randomly assigned to view either three PT PSAs or three SHP PSAs; both types contained anti-smoking advocacies (see Appendix B for a description of each PSA). The message selection process was an iterative one. First, both PT and SHP message types have been demonstrated to be effective with adolescent populations for different reasons, and thus they were selected for use in the larger grant study. Specifically, PT messages are low in bias (Cin et al., 2004), while SHP messages may encourage greater amounts of message elaboration to process the surprise/twist endings (Niederdeppe, 2005). Second, all six messages chosen were professionally produced PSAs that have been used in state-level anti-smoking campaigns. Third, the final messages were chosen because there was little chance this particular population had

seen the PSAs before, either because of the region the message was shown in (e.g., Massachusetts, California), or the year(s) in which the messages aired on television.

The three PT messages (*Cowboy, Pam Laffin*, & *Victim's Wife*) were pilot tested with a similar population and each message was perceived as effective and low in message bias. The SHP messages (*Cold Blooded, Crawling Babies*, & *SUV*) were selected as (a) the messages were not narratives, (b) college students rated these SHP messages similarly to the PT ones in terms of affective responses (Rhodes, et al., 2009), and c) SHP messages were expected to be perceived as more biased because of the surprise/twist ending (i.e., students might feel betrayed by the topic twist, leading to evaluating the message as biased). As PSAs could not be compared directly on all variables (i.e., the perceived bias scores of the SHP messages was not known), message sensation value (MSV) was used as a way to compare message features and select messages that were similar at least on one variable. An independent coder blind to the hypotheses coded the six messages for MSV. Using Morgan et al.'s (2003) MSV scale, the messages were assessed for the following features: negative visceral images, second-half punch, unrelated cuts (i.e., cuts to another scene), related cuts (i.e., cuts within the same scene), and background noise/satiation. MSV was determined by adding a value of 1 to the score in each of the following instances: presence of a negative visceral image(s), presence of a second-half punch, more than five unrelated cuts, more than five related edits, and presence of background noise/satiation. The potential range of scores was from 0 (no MSV features) to 6 (all six MSV features). The range for the PSAs was 1-3 with the three second-half punch messages all scoring a 2 (*Cold Blooded, Crawling Babies* and *SUV*); whereas the personal testimony messages ranged from 1-3 (*Pam Laffin* = 1, *Victim's Wife* = 2, *Cowboy* = 3). These data suggest the six messages had moderate to low MSV; however, it is difficult to compare these scores with prior work as

studies typically do not provide MSV data. For example, Morgan et al. (2003) did not provide a mean MSV score for the PSAs in their study nor did they provide a categorization structure. Rather, the authors reported correlations of MSV and perceived message sensation value (PMSV).

Procedures

There are two sets of procedures: Phase I was message exposure and Phase II was message recall.

Phase I: Message exposure. Members of the grant team met with school officials to present the project and obtain permission to work with their ninth-grade classes. Principals identified a school contact person (sometimes an administrative assistant, sometimes the head health teacher) who then served as the primary liaison between the grant team and the school. The primary liaison was responsible for working with the teachers who volunteered to work with the project. The grant team sent the liaison a packet of information to give to the teachers for the students to take home to parents. Students/parents received a letter containing information about the research project and two copies of a parental consent form, one for the parent to keep and the other for the student to return to school if s/he wanted to participate in the study (see Appendix E). To participate, students first had to bring their signed parental consent forms to school prior to or on the day of data collection; forms were sent home the week prior to data collection. Data were confidential and students completed assent forms (see Appendix F) with a researcher[2]. A federally certified IRB approved study procedures, as did the principal at each school.

Students were scheduled 10 at a time and data were collected during normal school hours. The school liaison scheduled the students in groups of ten and was responsible for getting the students to the data collection classroom for each session. A data collection lab was set up in

an empty classroom provided by the school. The ten computers were spaced throughout the room and privacy screens were used to maximize privacy and minimize distractions.

At the beginning of each data collection day, the school liaison brought the project manager the parental consent forms for all students participating that day. He or she also brought a list of who would be participating organized chronologically. Students were scheduled every 45 minutes throughout the day with the exception of the lunch hour. A grant team member checked off each name on the list against the parental consent forms before allowing students to participate. Students arrived in small groups of 2-3 or individually. Three or four researchers were on hand to greet the students, to review (orally) the assent form with each student, and to answer any questions students had prior to participating. Students were also encouraged to raise their hands during data collection if they had any questions or needed to stop participation for any reason.

After completing the assent process, each student was directed to sit in front of one of the laptop computers. A research assistant demonstrated how to adjust the noise reducing headsets and initiated the MediaLab program. All data during Phase I were collected on the computers and researchers were available to answer student questions. Researchers randomly assigned students to a message condition and MediaLab randomly set the order messages were shown within each condition. Prior work with this general population indicated literacy problems for many students; thus, all instructions, measures and response options were shown on a computer screen and heard over headsets.

Participants first completed the attitude accessibility task. They then completed a series of other measures (not reported in this dissertation), included within this set of measures were the items measuring smoking behavior. Participants then viewed the three PSAs. After each PSA,

participants completed the message bias and message elaboration scales and prior viewing items. Finally, students reported demographic information and a debriefing statement was displayed on the computer screen (see Appendix H). After reading the debriefing, students were instructed to raise their hand and one of the researchers would escort the student to the door. Outside the door, students received their compensation (detailed below). Then, students were reminded that we would be calling them in approximately 12 weeks to ask them some more questions. Students were asked to provide up to three phone numbers where they might be reached in three months time to complete the follow-up portion of the project. On average, students provided two phone numbers with some providing as few as one. Participants were subsequently thanked for their time and were instructed to return to their classrooms.

Phase II: Message recall. Message recall data were collected via telephone interviews conducted by trained telephone interviewers from the Market Research Division of Macro International. Interviewers began calling participants once the 12-week window had passed. Phone messages including a call back number were left if an answering machine device or voicemail system was active.

If the student agreed to participate in the telephone survey portion, they were asked if it was a good time or if the interviewer should call at a later date/time. Interviewers also encouraged participants to move to a private and quiet place. After verbal assent was obtained from the student, they were asked to provide a current address where their compensation for participation in the second phase could be sent. Both the original parental consent and youth assent forms collected at the schools explained that students would be contacted to participate in a follow-up telephone survey.

Students were first asked a series of questions not used in the present study. They were then asked to recall, without help, any of the PSAs they could remember. Finally, they answered demographic items, were asked if they had any questions, and were thanked for their time. The entire survey took approximately 15 minutes. See Appendix C for a portion of the interviewers' telephone survey script.

Compensation. As compensation for their time, assistance with the parental consent process, organization of the data collection schedule, and use of their space, each school was given $25 per student participant and teachers were given $10 for each student they recruited to participate. These funds could be used to purchase school supplies, which is particularly important for poor rural school districts that do not have the resources of suburban areas. Students were compensated with a $10 gift card to a local restaurant for their help during the message exposure portion of the study (Phase I). All students who participated in the recall portion of the project (Phase II) were mailed another $10 gift card for their time and help.

Independent Variable

The entire list of measures used in this dissertation is included in Appendix A. All items were selected or rewritten to be at a 5th grade reading level.

Attitude accessibility. Attitude accessibility was measured using DRT software controlled by MediaLab, a software program. Students were asked to give a like/dislike (1/-1) response to several items and each response time was recorded in milliseconds. The length of time it took an individual to make a decision about the item determined how accessible that item is to the individual. A list of 26 practice items was provided first to give each student an opportunity to get used to the procedure and to familiarize themselves with the answer keys (see Roskos-Ewoldsen & Fazio, 1992; Shen et al., 2009; for similar procedures). A second set of 12 items

allowed participants to gain speed on the reaction time measures and gain additional familiarity with the procedures. The final set of 12 items had the critical attitude item: cigarettes. The full list of items is included in Appendix A.

To create the attitude accessibility measure, the cigarette attitude latency score first underwent a reciprocal transformation. This transformation is necessary because latency data is typically highly skewed (see Fazio, 1990; Roskos-Ewoldsen & Fazio, 1992). Each latency score was then multiplied by 1000 to calculate the inverse of the reaction time, so that a higher score means a faster reaction time (i.e., higher accessibility). Finally, an interaction term was created by multiplying each score by the attitude valance (i.e., -1 or 1) so that the valence of the attitude was known.

Dependent Variables

Biased message processing and message elaboration serve as independent variables (when predicting message recall) and dependent variables (when predicted by attitude accessibility). I elected to describe them here under dependent variables along with the main dependent variable of unaided recall.

Biased message processing. In the literature, biased message processing has been measured two ways: through the use of scales and thought listing. Thought listing primarily is used with older populations; a search of the literature found only one instance of this technique being used with a population this young (see Shen et al., 2009). With this same population, Shen et al. (2009) piloted a thought listing procedure with students who provided brief responses that were difficult to understand and/or code. Thus, we elected to use Witte's (1994) message bias scale. Witte argues the scale measures two dimensions of bias: message minimization and perceived manipulation. Message minimization items asked participants if the message was

"distorted," "overblown," "exaggerated," "boring," or "overstated" (scale reliability was reported as α = .78; Witte, 1994). Perceived manipulation items asked participants if they felt "manipulated," or "exploited," or if the message "deliberately tried to manipulate my feelings" (posttest α = .66, follow-up α = .81; Witte, 1994). Witte (1991) validated the scale through a content analysis of cognitive responses. All responses are assessed on a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree).

Even though Witte (1994) has claimed the scale measures two dimensions of reactance, confirmatory factor analyses in other studies indicate the measure is unidimensional (e.g., Nabi, Roskos-Ewoldsen, & Carpentier, 2003; Roskos-Ewoldsen, et al., 2004; Shen et al., 2009). Prior research with the unidimensional scale found good internal consistency reliabilities, for example, Shen et al. (2009) report Cronbach α reliability scores ranging from .86 to .89.

Message elaboration. Measures of message elaboration have primarily developed from two dual-process models of persuasion: the heuristic-systematic model (Chaiken et al., 1989) and the elaboration likelihood model (Petty & Cacioppo, 1986). Both models assume that message arguments take more cognitive effort to consider while message components (i.e., spokesperson) take less effort. The primary interest of these items is to determine if the students thought about the message advocacy or the topic (i.e., smoking) as a function of message exposure.

Message elaboration was measured with five items on a 7-point (strongly disagree – strongly agree) Likert-type scale after each PSA. Two of the items had been created and used by the grant team in a previous study and asked the students for their thoughts about smoking. The items were, "When watching this ad, I did not want to think about smoking" and "Watching this ad made me really think about the bad parts of smoking." Three items were taken from Dunwoody and colleagues work on message processing depth (Griffin, Neuwirth, Giese, &

Dunwoody, 2002; Kahlor, Dunwoody, Griffin, Neuwirth, & Giese, 2003). Sample items include "This ad had more information about smoking than I personally need" and "I thought about how this ad related to other things I know about smoking." Two of the items were reversed coded ("When watching this ad, I did not want to think about smoking" and "This ad had more information about smoking than I personally need").

Unaided recall. In accordance with the memory literature, unaided recall asks participants describe a message they have seen with no cue concerning what the content of the message was. Unaided recall was measured approximately 12 weeks after message exposure. Trained interviewers called students at telephone numbers they provided to researchers at the time of data collection. Telephone interviewers were instructed to call each participate a maximum number of four times per phone number provided by the student (a maximum of 16 times across all numbers) or until one of the following occurred: survey completion, participation refusal, wrong phone number(s), or non-working phone number(s).

Table 3.3

Reasons Adolescents Did Not Complete Phase II of Study

Reason	Number	Percent (of original sample, N = 386)
Participation Refusal	14	3.63%
Wrong Phone Number(s)	18	4.66%
Non-Working Phone Number(s)	8	2.07%
Maximum Number of Attempts	102	26.42%

Phone numbers were collected from participants during the message exposure phase. Participants were asked for three different phone numbers (a few provided as many as four),

however, not all students were able to provide that many. Using this strategy, 63.2% (N = 244) of the original project's sample (N = 386) completed the telephone survey. Table 3.3 provides the number and reason each of the 142 adolescents did not participate in Phase II. The telephone survey researchers consistently reported that *if* they got hold of the student, students agreed to participate. The 36.8% non-response rate was almost always a function of not being able to get hold of the student from the phone numbers he or she gave the grant team.

During the recall task, students were asked to think back to when they participated in the study at school and if they remembered any of the ads they saw. We used the word "ads" to describe the messages as this term was more familiar to the population than "PSAs." If a participant indicated s/he could recall a message, the interviewer asked him/her to describe the message in as much detail as possible. This procedure was repeated until the student indicated s/he could not remember seeing any other messages. Trained interviewers, who did not know which messages each student saw, transcribed the students' responses. The telephone survey script is provided in Appendix C and examples of student responses can be found in Appendix D.

Potential Covariates

Smoking behavior. Individuals' cigarette use may be used as a covariate because of its potential impact on the major variables. As already discussed, a correlation between attitude accessibility and behavior is expected (Fazio, 1986; Roskos-Ewoldsen, 1997). Tobacco advertising research also demonstrates a strong relationship between smoking behavior and recall of mediated smoking-related messages; several studies report adolescent smokers report higher recall of smoking brands and slogans than non-smokers (Biener & Siegel, 2000; Chapman & Fitzgerald, 1982; Pierce, Choi, Gilpin, Farkas, & Berry, 1998).

Smoking behavior was measured with two items from the Global Youth Tobacco Survey (GYTS) created by the CDC, World Health Organization (WHO), and the Canadian Public Health Association (CPHA). The GYTS is designed for young adolescents aged 13 to 15 years old (CDC, 2009). Students responded to two items: "During the past 30 days (one month), on how many days did you smoke cigarettes?" and "During the past 30 days (one month), on the days you smoked, how many cigarettes did you usually smoke?"[1] (CDC, 2008). Given prior studies demonstrate that young adolescent smoking behavior rarely forms a normal distribution, the two smoking behavior items (items 1 and 2 in Appendix A) were multiplied and then transformed by taking the square root (see Shen et al., 2009).

Prior viewing. Following each message, students were asked if they had seen that particular PSA before or one that was similar. Two items determined prior viewing: "I've seen this ad before," and "I've seen ads like this before." Response options were "yes, "maybe," "no" for the first statement and "yes" or "no" for the second. A low prior viewing score was expected for each participant given that the State of Georgia has no funding set aside for purchasing viewing time for anti-smoking PSAs and because these messages were created by organizations in other states. It should be noted these items provide a measure of recognition recall.

Demographic Information

Age. Participants self-reported their age, responding to the statement "My age is…" Because the larger grant project was interested in young adolescents, only high school freshman were recruited for participation. A wide age range was not expected as all participants were pulled from the same grade level.

Gender. Students were asked to select their sex by category: "I am female/male." For purposes of this study, an adolescent's sex identification represented his/her gender identity as

there are no theoretical reasons to look for biological differences in attitude accessibility or unaided recall ability. There may, however, be cultural differences between the two genders.

Race. One of the aims of the larger grant project was to compare smoking behavior and attitudes of young African American and White adolescents. Each student reported his/her race or ethnicity at the end of the questionnaire. This project used the same categories suggested by the National Institutes of Health (NIH): African American/Black, Asian or Pacific Islander, White, American Indian, Hispanic, or Other. Students were asked "Which race or ethnicity best describes you?" (National Institutes of Health [NIH], 2001) and were only allowed to select one answer by design of the computer program. For "Other" a space was provided for the individual to type a more specific answer. Similar to gender, racial identity holds a cultural meaning as opposed to a biological meaning.

CHAPTER 4

RESULTS

Preliminary Results

Before analyses were conducted to test the hypotheses, frequency information and scale reliabilities were calculated; followed by scale construction when appropriate. Attrition rate and potential differences among participants who only participated in Phase I (message exposure in school) and those who also participated in Phase II (message recall via telephone survey) on all major variables were also detailed before analyses. Preliminary results were conducted in SPSS 17.0 or STATA 10.0.

Attrition

Phase I had a total of 386 participants, while 244 adolescents completed Phase II. As a result, 63.2% of the original sample completed both phases and are included in these analyses. An analysis of those who completed both phases with those who completed only Phase I on the major variables is presented in Table 4.1. Percentages are presented for binary measures (race, gender, attitude) and means and standard deviations (reported in parentheses) are presented for the rest. Table 4.1 also presents the statistical test conducted to determine if statistically significant differences exist between these two groups. The only significant difference occurred with message elaboration; adolescents who participated in both phases reported elaborating more on the messages than those who only participated in the first phase. Thus, with the exception of message elaboration, the two samples are comparable on all other major variables for this study.

Table 4.1

Comparison of Participants Who Completed Only Phase I with Those Who Completed Both Phases

Variable	Phase 1 Only	Both Phases	Statistical Test	*df*	Sig.
Race	55.7% AA	48.7% AA	$\chi^2 = 1.86$	1	.17
	44.3% W	51.7% W			
Gender	55.7% F	59.4% F	$\chi^2 = .11$	1	.75
	42.3% M	40.6% M			
Smoking Behavior	*m* = 1.37	*m* = 1.76	*t* = -.74	384	.46
	(1.02)	(6.32)			
Attitude	90% anti-cig	87.2% anti-cig	$\chi^2 = .72$	1	.40
	10% pro-cig	12.8% pro-cig			
Attitude Accessibility	*m* = .97	*m* = .98	*t* = -.45	383	.67
	(.36)	(.37)			
Attitude x Accessibility	*m* = -.73	*m* = -.83	*t* = 1.38	380	.17
	(.73)	(.66)			
Biased Message Processing	*m* = 2.52 – 2.58	*m* = 2.39 – 2.49	F = .89	1	.35
	(1.33 – 1.50)	(1.38-1.44)			
Message Elaboration	*m* = 4.48 – 4.62	*m* = 4.81 – 4.87	F = 4.44	1	.04*
	(.93 – 1.06)	(1.70 - 1.79)			

AA = African American, W = White; F = Female, M = Male. * $p < .05$. *Note*: Ranges are provided for Biased Message Processing and Message Elaboration because participants saw three PSAs.

Message Type

As previously discussed, adolescents were randomly assigned to view either three Personal Testimony (PT) or three Second-Half Punch (SHP) PSAs with anti-smoking advocacies. Of those who participated in both phases, 53% (n = 129) of the participants saw PT messages and 47% (n = 115) saw SHP messages. In analyses, PT messages were coded as 1 and SHP messages were coded as 2.

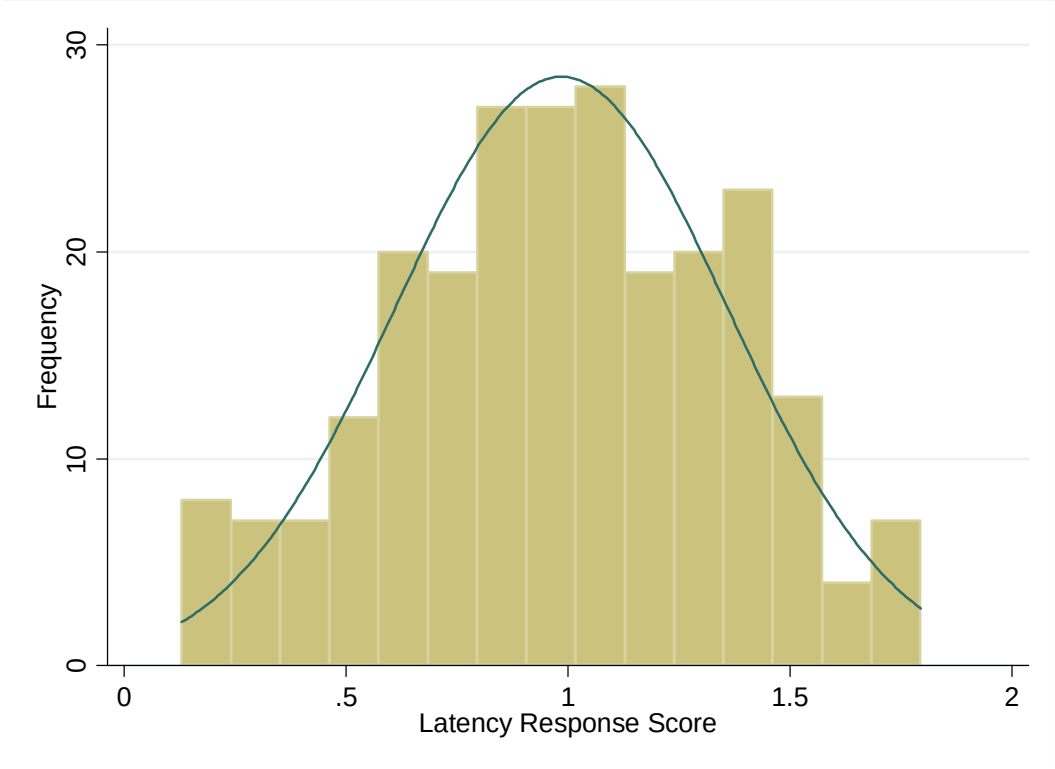

Figure 4.1 Reciprocally transformed latency response scores for cigarette attitudes

Independent Variables

Attitude accessibility. Prior to reciprocal transformation, the latency response measures were skewed, skewness = 3.74, *SE* = .16, kurtosis = 16.16, *SE* = .31. After the transformation, the scores had a close to normal distribution, skewness = -.13, *SE* = .16, kurtosis = -.51, *SE* = .31 (see Figure 4.1 above). The final attitude accessibility measure was a multiplication of the

transformed latency response score by the attitude valence (-1 = negative attitude toward cigarettes, +1 = positive attitude toward cigarettes). The scores range from -1.80 to 1.48, the higher the score the more accessible the cigarette attitude. As hypotheses were only interested in the impact of attitude accessibility and valance, the interaction term is used more often than just attitude accessibility and will be referred to as attitude x accessibility.

Dependent Variables

Biased message processing. Three scores were calculated per participant, as individuals answered the items after each message (message order was randomly determined by the computer program MediaLab). Response options ranged from (1) strongly disagree to (7) strongly agree. A confirmatory factor analysis was performed and all items loaded on a single factor. Cronbach's alpha ranged from .87 to .89. Across message order and PSA, the mean ranged from 2.39 to 2.49, with a standard error of .09 for all. Scores for biased message processing were low and skewed across all PSAs, $m = 2.44$, Mdn = 2.13, $SE = .05$, skewness = .98, *SE* for skewness = .09. A natural log transformation was used to correct for skewness, skewness = .12, *SE* for skewness = .09. Note that biased message processing was used as both a dependent (H1) and independent variable (H4) in analyses.

Message elaboration. Again, three scores were calculated for each participant because they responded to the items after each message. Options ranged from (1) strongly disagree to (7) strongly agree. Two of the items were reverse coded ("When watching this ad, I did not want to think about smoking" and "This ad had more information about smoking than I personally need"). Item reliability was adequate; Cronbach's alpha ranged from .77 to .79. A confirmatory factor analysis was performed and all items loaded on a single factor. Across message order and

PSA, elaboration means ranged from 4.81 to 4.87, with a standard error of.11 for all. Message elaboration was used as both a dependent (H2) and independent variable (H6) in analyses.

Witte (1994) argues individuals engage in message minimization and/or perceive the message as manipulative when they rate a message as biased. As these reactions could cause one to think about a message more or less, a correlation test was performed to determine if message elaboration and biased message processing were related. Not surprisingly, the two variables were modestly but negatively correlated (See Table 4.2). Based on these results, a correlation matrix was calculated for attitude accessibility, biased message processing, and message elaboration. Table 4.2 presents the significant correlations between the three main variables.

Table 4.2

Correlation Matrix of Major Independent Variables

	AA	BP	ME
Attitude Accessibility (AA)	1.00		
Biased Message Processing (BP)	.16 to .22*	1.00	
Message Elaboration (ME)	-.11 to -.22*	-.08 to -.20*	1.00

* $p < .05$. *Note:* Ranges are provided for measures that participants answered three times (after viewing each PSA).

Unaided recall. Unaided recall was coded by two independent coders for both general accuracy and health advocacy accuracy. Students described anything they could remember about a given PSA(s). Coders first examined a specific recall statement provided by the student (because they were not prompted for specific messages) to figure out which message the student was referring to. For example, one student responded, "In a car I know and there was gas or something" so this message was coded as the *SUV*. Recall statements that could not be positively linked to any of the six messages were eliminated. For example, one eliminated response was,

"one had Britney Spears in it, it's been a while," because there was no message that featured Britney Spears or anyone who may resemble Britney Spears.

Next, the coders evaluated the general level of accuracy of the PSA description by considering both the health and non-health aspects of the message. Descriptions were coded as partially accurate (some = 1) and accurate (all = 2); messages that were not recalled were coded as 0. An example of an accurate response about message was, "this man old guy who smoked cigarettes and his wife told him not to and she died from secondhand cigarette smoke." An example of a partially accurate response about a message was, "in a car I know and there was gas or something." Additional examples can be found in the code book in Appendix D.

Finally, descriptions were coded for the accuracy of the health advocacy recalled (0 = not recalled, 1 = recalled). To be coded as accurate participants not only had to recall that the PSA was about smoking (and not, for example, drunk driving), but also what the specific advocacy of the message was (i.e., do not smoke around others, smoking causes illness, etc.). Messages that were coded as 2 (all) for general message accuracy also had to meet the criteria for an accurate health advocacy recall (1). Again, examples can be found in the code book in Appendix D.

Intercoder reliability was estimated using Krippendorff's α as it can be used with any number of judges, any level of measurement, and with missing data. A macro developed for SPSS was used for the estimate (for full macro see Hayes & Krippendorff, 2007). Intercoder reliability was estimated three times at random intervals during the coding process with a total of 20% of the data. After the first estimation, Krippendorff's α was .64 and further coding instruction and discussion was carried out. Data used in the first reliability estimate were then recoded. The second and third estimates resulted in Krippendorff's α of .81 for both. Therefore, reliability between the two coders was adequate.

General accuracy recall could be coded as "not recalled," "some," or "all."[3] Table 4.3 presents the data for level of general accuracy recall by message. The data indicate the modal response for all PSAs is "not recalled" meaning most participants had difficulty remembering the messages. Because so few participants were able to recall "all" of any message (0 participants for three of the six messages), analyses could not be run with the original coding categories. Therefore, the "all" and "some" categories were collapsed, creating a binary measure ("not recalled" and "some").

Table 4.3

General Accuracy Recall by PSA

	Accuracy Level		
PSA	Not Recalled	Some	All
Second Half Punch			
Cold Blooded	89.6%	7.8%	0.0%
Crawling Babies	71.3%	27.0%	0.0%
SUV	67.8%	23.5%	0.9%
Personal Testimony			
Cowboy	69.0%	24.8%	3.9%
Pam Laffin	74.4%	20.9%	0.0%
Victim's Wife	66.7%	22.5%	7.8%

Note: Total percents do not equal 100 because responses that could not be linked to a particular PSA were eliminated.

Table 4.4 presents the results for health advocacy recall with "correct" indicating that participants remembered the health advocacy part of the message correctly and "not recalled" for not being able to remember the specific message advocacy. Adolescents were able to recall the

advocacies of two of the PT messages, *Cowboy* and *Victim's Wife,* more frequently than the other PSAs. No one was able to recall the health advocacy of *Cold Blooded*.

Table 4.4

Health Advocacy Accuracy Recall by PSA

	Recalled	
PSA	Not Recalled	Correctly
Second Half Punch		
Cold Blooded	100.0%	0.0%
Crawling Babies	95.6%	4.3%
SUV	97.4%	2.6%
Personal Testimony		
Cowboy	83.7%	16.3%
Pam Laffin	96.1%	3.9%
Victim's Wife	83.0%	17.1%

General recall and health advocacy recall must be correlated since being coded as "all" in general recall means by definition that the health advocacy was also recalled correctly. Yet, most participants did *not* typically get the full message correct; remember that "not recalled" was the modal response with "some" being the second most frequent. Kendall's tau-c was computed for each message comparing the general recall with the health advocacy. As expected, the correlation of responses were modest[4] (ranging from .04 to .16, *n.s.*, for the SHP messages, and .11 to .55, $p < .05$, for the PT messages). Table 4.5 presents data demonstrating what percent of participants got some of the message correct but not the health advocacy, as compared to those

who got some of the message and health advocacy correct. Clearly, there was a substantial percentage of the sample that recalled some of the message but not the health advocacy. This difference suggests remembering the advocacy of the message was more difficult than general recall, which could include remembering characters or actions in the message.

Table 4.5

Health Advocacy Recall by General Message Recall for Participants Who Recalled at Least Some of a Message

PSA	Recalled Some of Message but *not* Health Advocacy	Recalled Health Advocacy
Second-Half Punch		
Cold Blooded	100.00%	0.00%
Crawling Babies	83.9%	16.13%
SUV	88.89%	11.11%
Personal Testimony		
Cowboy	41.17%	58.33%
Pam Laffin	81.48%	18.52%
Victim's Wife	45.00%	55.00%

Potential Covariates

Smoking behavior. As found in other studies of young adolescents, smoking behavior did not form a normal distribution; therefore, smoking behavior was calculated as a frequency by multiplying two behavior measures and taking the square root (see Shen et al., 2009). The smoking behavior frequency ranged from 1 (no smoking in the past 30 days) to 5.9 (highest possible score was a 7), with a mean of 1.36 (*s.d.* = .95). While the frequency score for smoking

behavior was low, as was expected, 41.8% of the participants reported having tried cigarettes in the past. Somewhat surprising, attitude accessibility and smoking behavior were not correlated (r = -.09, *n.s.*); likely because of the low frequency of smokers.

To determine whether smoking behavior should be included in analyses, separate regressions were run with each of the major variables as dependent variables and smoking behavior as the independent variable. To test biased message processing and message elaboration, multilinear random-effects regression models were estimated. To test the relationship with general accuracy and health advocacy recall, probit regression models were estimated. Results are presented in Table 4.6; no significant results were obtained. Therefore, smoking behavior is not included as a covariate.

Table 4.6

Regression Model Estimates for Smoking Behavior

Dependent Variable	*B*	S.E.	z	Sig.	95% CI	
					Lower Bound	Upper Bound
Biased Processing	.01	.01	.87	.39	-.01	.04
Message Elaboration	.01	.02	.85	.40	-.02	.04
General Accuracy Recall	-.04	.05	-.70	.48	-.14	.07
Health Advocacy Recall	.15	.14	1.06	.29	-.13	.43

*$p \leq .05$

Prior viewing. Prior viewing was measured with two separate items that asked participants if they had seen the exact message before ("yes," "no," or "maybe) or seen a message like it before ("yes" or "no"). Table 4.7 presents the results for both.

Table 4.7

Self-Reported Prior Viewing by PSA

	Seen Before			Seen Similar Before	
PSA	No	Maybe	Yes	No	Yes
Second Half Punch					
Cold Blooded	79.8%	14.0%	6.1%	31.6%	68.4%
Crawling Babies	45.6%	16.7%	37.7%	14.0%	86.0%
SUV	71.9%	14.0%	14.0%	27.2%	72.8%
Personal Testimony					
Cowboy	78.5%	12.3%	9.2%	25.4%	74.6%
Pam Laffin	83.1%	11.5%	5.4%	30.0%	70.0%
Victim's Wife	78.5%	10.0%	11.5%	23.1%	76.9%

As these messages were chosen, in part, because there was a low chance of this population having seen them before, "yes" responses were expected to be low. Indeed, for five out of six messages, over 70% of participants reported they had not seen the message before. *Crawling Babies* was the PSA the students were most likely to have seen (37.7% reported having seen it previously). Not surprisingly, *Crawling Babies* was also the message most thought they had seen something similar to before (86%) and *Cold Blooded* was the message they were least likely to believe they had seen a message like before (68.4%). All other messages were in the 70% range.

To test the relationship between prior viewing variables and the major dependent variables, separate regression analyses were again conducted. Multilinear random-effects regression models were estimated for biased message processing and message elaboration, with

"seen before" and "seen like" as independent variables. Probit regressions were conducted with general accuracy recall and health advocacy recall, with the prior viewing variables as the independent variables. The results are presented in Table 4.8 ("seen before") and Table 4.9 ("seen like"). None of the results were significant; suggesting prior viewing did not significantly affect message perceptions or delayed recall. Therefore, prior viewing is not included in analyses.

Table 4.8

Regression Model Estimates for "Have You Seen This Message Before?"

					95% CI	
Variable	*B*	S.E.	z	Sig.	Lower Bound	Upper Bound
Biased Message Processing	-.01	.02	-.58	.56	-.05	.03
Message Elaboration	.00	.02	-.04	1.00	-.03	.03
General Accuracy Recall	-.07	.07	-.98	.33	-.21	.07
Health Advocacy Recall	.07	.10	.74	.46	-.12	.27

Table 4.9

Regression Model Estimates for "Have You Seen a Message Like This Before?"

					95% CI	
Variable	*B*	S.E.	z	Sig.	Lower Bound	Upper Bound
Biased Message Processing	.02	.01	1.70	.09	.00	.04
Message Elaboration	-.01	.01	-.80	.43	-.03	.01
General Accuracy Recall	-.14	.12	-1.16	.25	-.38	.10
Health Advocacy Recall	-.29	.17	-1.68	.09	-.63	.05

Major Results

Recall that a 2 (Gender) X 2 (Race: African American vs. White) X 2 (Message type: personal testimony vs. second-half punch messages) x 3 (Message: nested within condition) mixed design was used. The first two factors were measured; participants were randomly assigned to view either personal testimony (PT) or second-half punch (SHP) messages, and within condition, the order participants viewed the three messages was also random. Participants evaluated each message immediately after viewing it. Message recall measures were taken approximately 12 weeks after message exposure via a telephone survey. Both perceptions of message bias and message elaboration were repeated measures defined by PSAs, with PSAs nested within message type. To test H1 and H2, two-level multilinear random-effects regression models were calculated in STATA 10.0 (see Rabe-Hesketh & Skrondal, 2005 for general linear modeling in STATA discussion). To test H3 to H9, two-level multilinear random-effects probit regression models were estimated in because the dependent variables (general accuracy recall and health advocacy recall) are binary measures. All analyses were conducted in STATA 10.0.

Hypothesis One

The first hypothesis states that individuals with message inconsistent attitudes will engage in more biased message processing than those with message consistent attitudes, but only when attitude accessibility is high. Evidence for both hypotheses should come from a significant interaction effect between attitude and accessibility (see Shen, et al., 2009). As shown in Table 4.10, message type was significant such that SHP messages (m = 2.74, SE = .08) resulted in more bias than did PT messages (m = 2.18, SE = .07). In addition, males (m = 2.67, SE = .09) reported the messages were significantly more biased than did females (m = 2.30, SE = .06). Finally, the attitude valance-accessibility interaction term was positive and significant providing initial

support for H1. The means and standard errors (in parentheses) for biased message processing by attitude valence and accessibility are presented in Table 4.11.

Table 4.10

Maximum Likelihood Estimates of Fixed Effects on Perceived Message Bias

Parameter	β	*SE*	*z*	Sig.	95% CI	
					Lower Bound	Upper Bound
Message Type[a]	.24	.06	3.81	.001**	.12	.36
Race[b]	.04	.06	.67	.50	-.08	.17
Gender[c]	.16	.06	2.55	.01*	.04	.29
Attitude x Accessibility	.12	.05	2.55	.01*	.03	.22

a. PT = 1, SHP = 2; b. African American = 1, White = 2; c. Female = 1, Male = 2. * $p < .05$, ** $p < .001$

Table 4.11

Biased Message Processing Means and Standard Errors by Attitude Valence and Accessibility

	High Accessibility	Low Accessibility
Anti-Cigarette Attitude	2.34*	2.31*
	(.07)	(.07)
Pro-Cigarette Attitude	4.39*[a]	3.01*[a]
	(.37)	(.24)

Note: Shared superscripts denote mean differences that are significant within attitude while asterisks denote significant mean differences within accessibility conditions.

To further investigate, data were median split (1.02 seconds) into higher and lower attitude accessibility and two models were estimated. The interest of this analysis is whether the attitude valance coefficient is significant, since the data were spilt by accessibility. Results for

attitude were positive and significant among individuals with highly accessible attitudes (β = .14**,** *SE* = .07, *z* = 2.19, *p* = .03, 95% CI range .01 to .27); those with a positive attitude toward cigarettes perceived the messages as more biased than those with a negative attitude toward cigarettes. Among those with low accessibility, attitude barely missed significance, β = .11**,** *SE* = .06, *z* = 1.80, *p* = .07, 95% CI range -.01 to .24. In addition, the largest difference in biased message processing occurs within highly accessible attitudes (see Table 4.11), which provides support for H1.

Table 4.12

Maximum Likelihood Estimates of Fixed Effects on Message Elaboration

Parameter	β	*SE*	*z*	Sig.	95% CI	
					Lower Bound	Upper Bound
Message Type[a]	-.44	.19	-2.36	.01*	-.81	-.08
Race[b]	-.83	.19	-4.32	.001**	-1.20	-.45
Gender[c]	.04	.19	.18	.86	-.35	.42
Attitude x Accessibility	-.37	.15	-2.52	.01*	-.66	-.08

a. PT = 1, SHP = 2; b. African American = 1, White = 2; c. Female = 1, Male = 2. * $p < .05$, ** $p < .001$

Hypothesis Two

The second hypothesis states that individuals with message consistent attitudes will engage in more message elaboration than those with message inconsistent attitudes, but only when attitude accessibility is high. Table 4.12 displays the results. Participants reported engaging in more elaboration after watching PT messages (*m* = 5.02, *SE* = .08) than SHP messages (*m* = 4.63, *SE* = .10). African Americans adolescents (*m* = 5.27, *SE* = .09) reported engaging in more elaboration than did White adolescents (*m* = 4.61, *SE* = .09). And the attitude valance-accessibility interaction term was significant.

Table 4.13

Message Elaboration Means and Standard Errors by Attitude Valence and Accessibility

	High Accessibility	Low Accessibility
Anti-Cigarette Attitude	4.98*	4.86
	(.08)	(.10)
Pro-Cigarette Attitude	2.95*[a]	4.53[a]
	(.32)	(.29)

Note: Shared superscripts denote mean differences that are significant within attitude while asterisks denote significant mean differences within accessibility conditions.

To further investigate, individuals were again split into higher and lower attitude accessibility (median = 1.02 seconds) groups. Table 4.13 presents the means and standard errors (in parentheses) for message elaboration by attitude valance and accessibility. Again, because the participants were separated into higher and lower attitude accessibility, the interest was in a difference between anti- and pro- cigarette attitudes. Among those with higher attitude accessibility, attitude valance (-1 = unfavorable toward cigarettes, +1 = favorable toward cigarettes) was non-significant, β = -.35, *SE* = .21, z = -1.66, p = .10, 95% CI -.77 to .06. That is, individuals with highly accessible anti-cigarette attitudes (or message consistent attitudes) reported engaging in more message elaboration than did individuals with highly accessible pro-cigarette attitudes. Attitude valance was also non-significant among those with lower attitude accessibility, β = -.28, *SE* = .21, z = -1.33, p = .18, 95% CI -.68 to .13. Thus, H2 was not supported.

Hypothesis Three

The third hypothesis states that individuals with message consistent attitudes will accurately recall more messages than those with message inconstant attitudes, but only when attitude accessibility is high. The results are displayed in Table 4.14. Adolescents were able to

accurately recall more of the PT messages (m = .28, SE = .02) than the SHP messages (m = .21, SE = .02).

Table 4.14

Fixed Effects: Attitude Accessibility on Unaided Message Recall

					95% CI	
Parameter	β	SE	z	Sig.	Lower Bound	Upper Bound
Message Type[a]	-.29	.11	-2.65	.008*	-.50	-.07
Race[b]	-.07	.11	-.60	.55	-.28	.15
Gender[c]	.00	.11	.02	.98	-.22	.22
Attitude x Accessibility	-.18	.09	-2.00	.05*	-.35	.00

a. PT = 1, SHP = 2; b. African American = 1, White = 2; c. Female = 1, Male = 2. * $p < .05$

Table 4.15

Unaided Recall Means and Standard Errors by Attitude Valence and Accessibility

	High Accessibility	Low Accessibility
Anti-Cigarette Attitude	.24	.24
	(.03)	(.03)
Pro-Cigarette Attitude	.19	.20
	(.06)	(.06)

The attitude accessibility-valance interaction term was negative and significant; therefore participants were again split into higher and lower attitude accessibility (median = 1.02 seconds). The means and standard errors (in parentheses) for unaided recall by attitude valance and accessibility are presented in Table 4.15; there were no significant differences among the means. Again, because the participants were separated into higher and lower attitude accessibility, the interest was in a difference between anti- and pro- cigarette attitudes. Higher attitude

accessibility: β = -.11, *SE* = .12, *z* = -.94, *p* = .36, 95% CI -.35 to .12. Lower attitude accessibility: β = -.10, *SE* = .12, *z* = -.85, *p* = .40, 95% CI -.32 to .13. Thus, H3 was not supported.

Hypothesis Four

The forth hypothesis states that biased message processing and unaided recall for a message are negatively associated; as biased message processing increases, message recall will decrease. As shown in Table 4.16, message type was again significant (see results under H3). Also, the relationship between perceptions of message bias and message recall was negative and significant. As perceptions of message bias increased, delayed message recall decreased, supporting H4.

Tests of the fifth and seventh hypotheses follow the sixth hypothesis, as they explore the potential moderator effects of perceived message bias and message elaboration.

Table 4.16

Fixed Effects: Perceived Message Bias on Unaided Recall

					95% CI	
Parameter	β	*SE*	*z*	Sig.	Lower Bound	Upper Bound
Message Type[a]	-.21	.11	-1.96	.05*	-.43	.00
Race[b]	-.08	.11	-.78	.44	-.29	.13
Gender[c]	.01	.11	.12	.90	-.20	.23
Perceived Message Bias	-.23	.10	-2.39	.02*	-.42	-.04

a. PT = 1, SHP = 2; b. African American = 1, White = 2; c. Female = 1, Male = 2. * $p \leq .05$

Table 4.17

Fixed Effects: Message Elaboration on Unaided Recall

					95% CI	
Parameter	*β*	*SE*	*z*	Sig.	Lower Bound	Upper Bound
Message Type[a]	-.26	.11	-2.38	.02*	-.47	-.05
Race[b]	-.06	.11	-.59	.56	-.28	.15
Gender[c]	-.03	.11	-.28	.78	-.24	.18
Message Elaboration	.04	.03	1.24	.24	-.02	.11

a. PT = 1, SHP = 2; b. African American = 1, White = 2; c. Female = 1, Male = 2. * $p < .05$

Hypothesis Six

The sixth hypothesis states that message elaboration and unaided recall for a message are positively associated; as message elaboration increases, message recall will increase. As shown in Table 4.17, message type was again significant for delayed unaided recall (see results under H3). However, message elaboration did not reach significance. Therefore, H6 was not supported.

Hypotheses Five and Seven

The proposed model predicts biased message processing and message elaboration moderate attitude accessibility's relationship with delayed unaided message recall. From the hypotheses, attitude accessibility's relationship with delayed recall is unclear (see H3), proving another reason to consider biased processing and elaboration as moderators. In addition, the hypotheses do demonstrate that message consistent and highly accessible attitudes decrease biased message processing and increase elaboration. Biased processing and elaboration in turn decrease and increase delayed recall, respectively (see Figure 4.2).

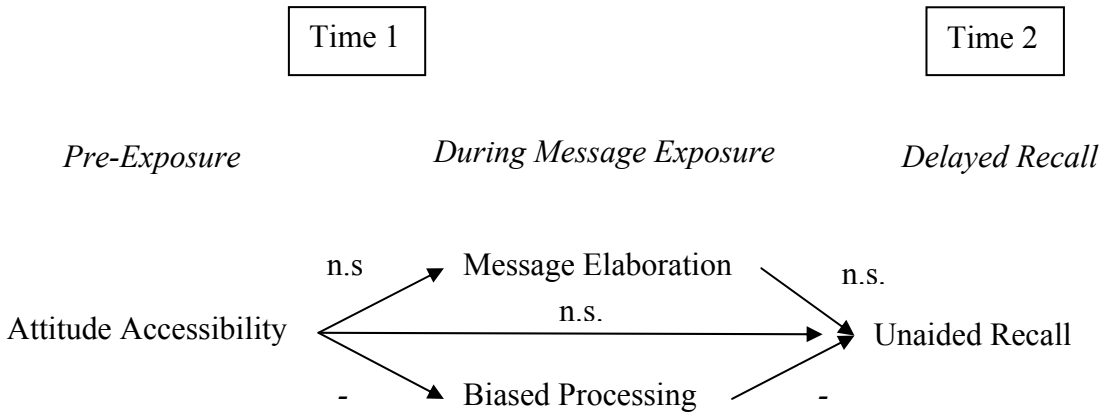

Figure 4.2 Hypotheses results.

Specifically, H5 states that individuals with high attitude accessibility and high levels of biased processing will accurately recall fewer messages. H7 states that individuals with high attitude accessibility and high levels of message elaboration will accurately recall more messages.

To test the moderator relationships, interaction terms were created for attitude accessibility-biased processing and attitude accessibility-message elaboration. As attitude accessibility, biased message processing, and message elaboration were all significantly correlated (see Table 4.2), a frequency score was created for attitude accessibility by taking the square root of the inverse of the reaction time score. This frequency score was then multiplied by each bias processing and elaboration score. A multilevel random-effects probit regression model was then estimated in STATA 10.0 with biased message processing and message elaboration separately. Attitude accessibility was not expected to be significant in either estimation based on the results for H3.

As displayed in Table 4.18, the main effect for biased message processing was negative and significant. Interestingly, the attitude accessibility-biased message processing interaction

term barely missed significance. So while a biased message processing moderating effect cannot be confirmed, it cannot be dismissed either.

Table 4.18

Moderating Effects of Biased Message Processing

					95% CI	
Parameter	*β*	*SE*	*z*	Sig.	Lower Bound	Upper Bound
Message Type[a]	-.19	.11	-1.76	.08	-.41	.02
Perceived Bias	-.43	.19	-2.33	.02*	-.80	-.07
Attitude Accessibility	-.63	.47	-1.34	.18	-1.56	.30
Attitude x Accessibility	-.07	.10	-.63	.53	-.27	.14
AA x Perceived Bias	1.04	.57	1.82	.07	-.08	2.16

AA = Attitude Accessibility
a. PT = 1, SHP = 2. * $p < .05$

Table 4.19

Moderating Effects of Message Elaboration

					95% CI	
Parameter	*β*	*SE*	*z*	Sig.	Lower Bound	Upper Bound
Message Type[a]	-.22	.11	-2.06	.04*	-.43	-.01
Msg. Elaboration	-.20	.12	-1.62	.11	-.44	.04
Attitude Accessibility	-1.11	.62	-1.80	.07	-2.31	.10
Attitude x Accessibility	-.08	.10	-.75	.45	-.28	.13
AA x Msg. Elaboration	1.06	.50	2.11	.04*	.07	2.05

AA = Attitude Accessibility
a. PT = 1, SHP = 2. * $p < .05$

Table 4.19 displays the results of the model estimation that included message elaboration and the attitude accessibility-message elaboration interaction term. Message type was again significant, predicting message recall. Barely missing significance was the main effect for

attitude accessibility. Importantly, the attitude accessibility-message elaboration interaction term was positive and significant.

Based on these results, the hypothesized moderating effects of biased message processing and message elaboration were partially supported. Biased message processing has a strong negative and significant relationship with delayed unaided recall; messages high in perceived bias were not remembered as well by young adolescents. As opposed to having main effect relationships with unaided recall, attitude accessibility and message elaboration appear to work together. Adolescents with highly accessible attitudes and higher amounts of message elaboration recalled PSAs more frequently. Also important to note, message type was significant in all by one model estimation (see H5) predicting delayed unaided recall.

Table 4.20

Fixed Effects: Message Type on Unaided Recall

					95% CI	
Parameter	*β*	*SE*	*z*	Sig.	Lower Bound	Upper Bound
Race[a]	-10	.11	-.92	.36	-.31	.11
Gender[b]	-.03	.11	-.32	.75	-.25	.18
Message Type[c]	-.27	.11	-2.55	.01*	-.48	-.06

a. African American = 1, White = 2; b. Female = 1, Male = 2; c. PT = 1, SHP = 2. * $p < .05$

Hypothesis Eight

The eighth hypothesis states that accurate unaided message recall will be higher for PT messages than for SHP messages. The results (displayed in Table 4.20) for message type were significant such that PT messages ($m = .28$, $SE = .02$) were recalled more frequently than SHP messages ($m = .21$, $SE = .02$). Therefore, H8 was supported.

Hypothesis Nine

The ninth hypothesis states that accurate *health advocacy* recall will be higher for PT messages than for SHP messages. As shown in Table 4.21, the health advocacies for PT messages (m = .30, SE = .03) were recalled more frequently than the health advocacies for SHP messages (m = .20, SE = .02). H9 was supported.

Table 4.21

Fixed Effects of Health Advocacy Recall

					95% CI	
Parameter	β	SE	z	Sig.	Lower Bound	Upper Bound
Race[a]	.39	.29	1.37	.17	-.17	.96
Gender[b]	-.08	.29	-.27	.79	-.64	.49
Message Type[c]	-1.45	.43	-3.39	.001*	-2.30	-.61

a. African American = 1, White = 2; b. Female = 1, Male = 2; c. PT = 1, SHP = 2. * $p < .05$

Hypotheses Results Summary

Table 4.22 presents a summary of the results of the hypotheses tests (sig. or *n.s.*). It is clear that attitude accessibility and attitude valance together have an impact on message perceptions, while the results for unaided delayed recall are less clear. The attitude accessibility-attitude valance interaction term was significant in the full participant test of general recall, but results were not significant when participants were split into high and low accessibility groups. Biased message processing and message type impacted delayed recall, while message type also impacted recall of the PSA's health advocacy.

Table 4.22

Summary of Hypotheses Results

H1: Individuals with message inconsistent attitudes will engage in more biased message processing than those with message consistent attitudes, but only when attitude accessibility is high.	supported
H2: Individuals with message consistent attitudes will engage in more message elaboration than those with message inconsistent attitudes, but only when attitude accessibility is high.	not supported
H3: Individuals with message consistent attitudes will accurately recall more messages than those with message inconstant attitudes, but only when attitude accessibility is high.	not supported
H4: Biased message processing and unaided recall for a message are negatively associated; as perceptions of bias increase, unaided message recall will decrease.	supported
H5: Individuals with high attitude accessibility and high levels of biased processing will accurately recall fewer messages.	not supported
H6: Message elaboration and unaided message recall are positively associated; as message elaboration increases, unaided message recall will increase.	not supported
H7: Individuals with high attitude accessibility and high levels of message elaboration will accurately recall more messages.	supported
H8: Accurate unaided message recall will be higher for PT messages than for SHP messages.	supported
H9: Accurate health advocacy recall will be higher for PT messages than for SHP messages.	supported

CHAPTER 5

DISCUSSION

The primary objective of this dissertation was to explore how attitude accessibility impacts young adolescents' delayed recall of anti-smoking PSAs. While theory and empirical evidence support the relationship between attitude-objects and accessibility (Fazio et al., 1982; Fazio et al., 1983; Powell & Fazio, 1984; Roskos-Ewoldsen & Fazio, 1992), attitude accessibility and attention (Bargh & Pratto, 1986; Higgins, 1996; Roskos-Ewoldsen, et al., 2002; Roskos-Ewoldsen & Fazio, 1992), attitude accessibility and biased message processing (Fazio, 1986; Fazio & Williams, 1999; Houston & Fazio, 1989; Roskos-Ewoldsen et al., 2004; Shen et al., 2009), and attitude accessibility and message elaboration (Fazio, 1986; Roskos-Ewoldsen, 1997; Roskos-Ewoldsen, Bichsel et al., 2002); there has been little explanation of how accessible attitudes affect memory for messages and future message recall. In addition, little research has examined young adolescents' memory for mediated messages. Focusing on this age group is important as they experience significant memory development and changes in memory (Adams, 1991; Bjorklun & de Marchena, 1984; Case et al., 1982; Gathercole et al., 2004; Hulme et al., 1984; Siegel, 1994; Swanson, 1999). Importantly, this dissertation provides evidence of the moderating effect of message elaboration in the attitude accessibility-delayed unaided recall relationship. Message type also resulted in varying degrees of successful recall, with health advocacies of personal testimony PSAs remembered more frequently by adolescents. Overall, adolescents had a difficult time recalling any of the PSAs (see Table 4.3). This difficulty may be

because it is difficult, after a single viewing, to remember 30-second PSAs after exposure, regardless of how accessible the topic is.

Based on the aforementioned research, a model of the attitude accessibility-delayed message recall relationship was proposed and tested with a young adolescent population (i.e., high school freshmen). This chapter provides an in-depth discussion of the results, limitations, implications for health communication, and future directions of this dissertation. First, findings relating to attitude accessibility's impact on message perceptions and delayed unaided recall are discussed, followed by differences in message type recall.

Attitude Accessibility

Different from what was hypothesized, attitude accessibility influenced delayed unaided recall only when moderated by message elaboration. Biased message processing may also moderate the relationship, although results did not quite reach significance. I begin with a discussion of attitude accessibility's impact on message elaboration and biased message processing followed by an examination of unaided recall results.

Message Elaboration

In this study, attitude accessibility did have a significant impact on message elaboration that is consistent with previous work that provides both theoretical (Fazio, 1986; Roskos-Ewoldsen, 1997) and empirical (Roskos-Ewoldsen, Bichsel et al., 2002) evidence for this relationship; even though significant results disappeared when adolescents were split into high and low attitude accessibility (see H2). Importantly, when every participant's attitude accessibility was considered on a continuum, highly accessible message consistent attitudes did increase how much adolescents thought about the message (see Table 4.12). This relationship is important to attitudes and related information as message elaboration should in turn

reinforce/increase the accessibility of the attitude (Roskos-Ewoldsen, 1997) and also activate similar information in memory creating stronger links (Cowan, 1988; Lang, 2000). Ultimately, adolescents who engage in greater amounts of message elaboration should retain and be able to recall more information about the message.

Interestingly, African American students reported thinking about the message advocacy more than White students (see Table 4.12). This result may be because African American adolescents have more involvement from family and community members in the creation of anti-smoking attitudes (Clark, Scarisbrick-Hauser, Gautam, & Wirk, 1999; Taylor et al., 1999). Thus, the advocacies of the PSAs are likely consistent with messages they repeatedly receive. Relatedly, African American adolescents have more complex smoking-related attitudinal structures than White adolescents (e.g., Roskos-Ewoldsen, Rhodes, Monahan, & Scales, 2007); which is likely related to more accessible anti-cigarette attitudes (Fabrigar et al., 1998). These findings provide evidence that family and community involvement are the first and possibly most important steps to preventing smoking initiation among young adolescents, while mediated message serve to reinforce such attitudes. These results also suggest race could be used for audience segmentation; White adolescents may need more information about the consequences of smoking.

Biased Message Processing

Based on prior work, I expected that perceptions of bias in messages would be a function of both attitude and accessibility. Specifically, those with highly accessible pro-cigarette attitudes would perceive the messages as significantly more biased than those with anti-cigarette attitudes. While this relationship was demonstrated, the results for low attitude accessibility barely missed significance. In addition, mean differences were found within accessibility (see

Table 4.11). These results suggest that while those with message inconsistent attitudes may perceive the messages as more biased, biased processing is greatest when the accessibility of the attitudes related to the message are high.

This finding has important implications for health communicators and health practitioners. Messages that feature advocacies inconsistent with an adolescent's currently held attitude will result in at least some perceived message bias. Thus, the intended audience of health-related PSAs needs to be carefully considered. If interested in smoking prevention, messages should focus on children and young adolescents, before the behavior has begun and before the majority have developed positive cigarette attitudes (see this study's population as an example). But repeated exposure to anti-smoking messages within this population is also key as it will reinforce negative cigarette attitudes and the accessibility of those attitudes. Without it, anti-smoking efforts would likely resemble the unsuccessful DARE project (Ennett, Tobler, Ringwalk, & Flewelling, 1994; Lyman, Milich, Zimmerman, Novak, Logan, Martin, et al., 1999). For older adolescents and adults, messages may need to focus on attitude change or self-efficacy (depending on the population), which may require a strategy different from those present in the PSAs in this study.

Like Shen et al. (2009), male adolescents reported the messages as more biased than female adolescents (see Table 4.10). The results of these studies is different from much of the prior research on message perceptions, which reports few gender differences (see Witte & Allen, 2000, meta-analysis) or focuses on differences on elaboration (see Putrevu, 2001, review). While a difference may have been found in this dissertation because of the age of participants, most prior work was with college students or adults, a few studies have found females are more persuaded by emotional messages (e.g., Andsager, Austin & Pinkleton, 2002; Fishbein, Hall-

Jamieson, Zimmer, von Haeften & Nabi, 2002). Assuming message bias and emotion are correlated, these findings may be consistent. Selecting messages low in bias is important for any population, as it has reduces message effectiveness, but it is particularly important for a young male population. Message types (see discussion below), message severity (e.g., *please consider* instead of *do not do*), and topic (e.g., smoking, drugs, ect.) can all influence the amount of bias perceived in a message. When concerned with preventing smoking initiation among young adolescent males, messages should be constructed employing techniques that may reduce the amount of bias perceived. For example, using personal testimony messages instead of second-half punch messages. This point is further discussed below, under message type.

Unaided Recall

Both accessibility and valance were predicted to affect delayed unaided recall. Highly accessible objects should receive more attention, increasing the likelihood of future recall (Fazio, 1986; Higgins, 1996; Higgins et al., 1982; Roskos-Ewoldsen, 1997; Roskos-Ewoldsen & Fazio, 1992). Thus, those with highly accessible cigarette attitudes should pay more attention to smoking-related messages than those with less accessible cigarette attitudes. Following this rationale and based on the memory literature, highly accessible message consistent attitudes were predicted to increase future recall. While initial results suggested a significant relationship (see Table 4.14), further investigation found that adolescents with highly accessible pro-cigarette attitudes were not significantly less likely to recall message content than were those with highly accessible anti-cigarette attitudes. Surprisingly, there were no significant differences, whether between attitude valance or attitude accessibility (see Table 4.15).

Instead, biased message processing significantly contributed to delayed unaided recall of PSAs; a greater amount of biased message processing resulted in less message recall. When its

role as a moderator in the attitude accessibility-recall relationship was explored, results barely missed significance. Thus, attitude valance and biased processing seem to be key to message storage and retrieval, which confirms care needs to be taken when selecting health messages to use with adolescents and messages with low levels of perceived bias should be chosen. In this study, personal testimony messages were perceived as less bias than second-half punch, which is further discussed under message type.

In combination, high attitude accessibility and high message elaboration resulted in a greater number of accurately recalled messages (see Table 4.19). Based on network models of memory and H2, it is assumed this result happened when attitudes were consistent with the message advocacy. Spending more time thinking about the advocacy of the message increased the amount of information the adolescent could store and link to relevant cigarette attitudes and knowledge, therefore increasing his/her ability to recall the message in the future. By elaborating on the PSAs, those adolescents were reinforcing their already held attitude. Reinforcing pre-existing anti-cigarette attitudes is important as it should make those attitudes more resistance to change in the future (e.g., Burgoon, Pfau, & Birk, 1995). Particularly as young adolescence is when many individuals re-evaluate such attitudes and decide that smoking (or drinking or drugs) is not that bad or is not bad all of the time (e.g., Dunn & Goldman, 1998; Johnston, O'Malley, & Bachman, 2002; Simons-Morton, Crump, Haynie, Saylor, Eitel, & Yu, 1999).

Overall, the adolescents had a difficult time recalling the PSAs (see Table 4.3). However, the low recall is not very surprising. Research on memory degradation suggests an unaided recall measure will result in lower recall than an aided recall measure because only accessible (and not all available) information should be remembered (see Neath & Surprenant, 2005). In addition, adolescents only saw each PSA one time and were not asked to recall it until three months later.

Turning to the forgetting literature, it is difficult to compare this populations' recall with known memory degradation curves because of the way forgetting is measured, how long after learning memory is assessed, and the types of information participants are asked to memorize. First, Ebbinghaus's classic forgetting cure calculates memory "savings" (or how long it took to relearn information) instead of the percent of information forgotten. And his curve timeline only goes up to two days (as cited in Zechmeister, 1982). Covering the same timeframe (2 days), Kalbaugh and Walls (1973) found that students who learned only one biographical passage were able to correctly answer nine out of 10 questions correctly while students who had learned four other passages were only able to correctly three of the questions. Studies that cover a longer period of time have primarily considered adults' memory of information or events related to personal experiences. For example, Bahrick, Bahrick and Wittlinger (1975) examined adults' memory for the names of high school classmates through unaided recall. The percent correct dropped from 80% to a little less than 70% during the first year. Finally, Linton (1975) examined her own recall of autobiographical incidents and found that she could recall approximately 97% of something that happened to her a year ago, but only about 37% of something that happened four and a half years ago (as cited in Baddeley, 1990). Ultimately, forgetting is a function of the type of information and exposure to the information (Baddeley, 1990).

Message Type

One of the unique findings of this dissertation is that personal testimony (PT) messages appear to be a better use of resources than second-half punch (SHP) messages. While this finding is not completely surprising because PT messages have long been known to be successful, it is unique because some studies have reported SHP messages increase message elaboration and are recalled (through aided means) more frequently than messages without surprise/twist endings

(e.g., Niederdeppe, 2005; Niederdeppe et al., 2007). However, this dissertation demonstrates that young adolescents perceived SHP messages as more biased and remembered them less accurately than PT messages. The following sections outline the impact of the narrative structure of PT messages on memory and recall, followed by a discussion of possible reasons SHP messages were not as successful with young adolescents.

Personal Testimony Messages

As previously mentioned, PT messages are a type of narrative (see Labov, 1974) and narrative structure is important to communication. Fisher (1989) argues that we interpret events as occurring in time and are "shaped by history, culture, and character" (p. 57). Ultimately, the narrative paradigm Fisher conceptualizes explains both our recounting and accounting of human communication and action. Whether attempting to provide a history of an event or explain an event, humans rely on story to relay information and make sense of things (Fisher, 1987). It influences our thoughts, perceptions and imaginations, and whenever possible, humans connect information to form a story (Sarbin, 1986). The basic structure of communication is a story (Ferrell, 1985; Fisher, 1985); therefore, it is not surprising that previous research on narrative messages has found consistent results in terms memory and recall. For example, strong narratives have been found to increase an individual's ability to remember messages (Graesser, 1981; Lang et al., 1995) and both audio and visual narratives increase an individual's message processing and amount of information stored (Lang, 1995).

The results of this dissertation add to this body of literature. PT messages were consistently recalled more accurately than SHP messages. The influence of the story form of the PT messages on message retention is clear in the recalling statements adolescents provided during the second phase of the study. A few examples are provided below. Two messages,

Cowboy and *Victim's Wife*, were particularly remembered with a lot of detail for the participants having only seen the PSA once three months before.

Cowboy:

> "I remember one that was a commercial of a cowboy, selling Marlborough and his brother was talking about how he died from that."
>
> "He was talking about how he had always seen the people on the smoking tobacco ad, saying how he wanted to be like them how he wanted to be like the cowboys. One of the cowboys was his brother and his brother had died from cancer from tobacco."

Victim's Wife:

> "He said that he had been smoking she tried to tell him to stop and he didn't and she was killed from second hand smoke."
>
> "I think he was sitting on the chair or sofa, he looked kind of old. He said his wife died from second hand smoke and I think it made him stop smoking or something."
>
> "He was sitting on the porch in a rocking chair and he was talking about his wife who died from second hand smoke and he was talking about that people shouldn't do that and people shouldn't be around them when they smoke and that's about all I remember."

All of these examples outline the basic story provided in each PSA. In both messages, the spokesperson tells a story about how his life was impacted by cigarette smoking. This structure not only helped the adolescents recall general aspects of the PSAs, but also the specific health advocacies. In all of the examples above, the specific advocacy, as well as who died, is recalled from the story.

Second-Half Punch Messages

In some of the literature, particularly that on message sensation value (MSV), SHP is discussed as a message feature. I argue it more importantly serves as a feature that distinguishes a specific message type. While it is possible for any type of message to have a surprising ending, the more important quality of the SHP messages used in this dissertation is that the message *topic* is unclear until the very end. By providing this topic twist, these messages stand apart from

traditional health messages and campaigns that clearly place the focus on the health topic/advocacy.

A trend that started in advertising, second-half punch (SHP) allows communicators to create messages that are more outlandish, and supposedly, attention grabbing. Well-known examples include Apple's 1984 Super Bowl ad *1984* and Electronic Data Systems' (EDS, now part of HP Enterprise Services) 2000 Super Bowl ad *Cat Wranglers*. However, in the case of health messages, this strategy to increase attention to the message does not seem to work. One explanation for this result is that SHP messages do not follow a narrative structure. Because humans understand stories (Ferrell, 1985; Fisher, 1985, 1987) and often try to create stories out of information (Sarbin, 1986), interpreting stories requires less mental capacity (Lang et al., 1995). Absent a narrative structure, SHP messages may be more difficult to remember because we are not as practiced at understanding them. The topic twist at the end of the message throws off any storyline that may have been followed to that point and the viewer may not know what to do with the new information.

Another possible explanation is that the SHP messages are stored in memory as something other than an anti-smoking message. In this study two of the SHP messages, *Cold Blooded* and *SUV*, take place in vehicles. The continual recall of the vehicle demonstrates how important adolescents' perceived it was to the advocacy of the message. The following responses were provided by adolescents who saw the SHP messages and had been asked to "describe one of the ads you remember" (see Telephone Survey Script, Appendix C).

Cold Blooded:

> "It was when the guy was driving the car in the city, that's all I can recall."
>
> "I know he ran over a bicyclist I think and he didn't stop, he just kept on going like he didn't care."

> "There was this, he was some man in a car, and he was driving, and there was a kid in the road and he hit him."
>
> "I know he hit some people and he didn't really care and he just kept driving and didn't pay attention."

SUV:

> "I just remember seeing a picture of them and they were in their car, and it was family."
>
> "They were sitting in the car and the dad passed gas and that's about it."
>
> "They were in a car, they were talking about something and it was something that wasn't a cigarette but was kind of like a cigarette."

By placing the focus of the PSAs on the vehicle, the messages are either reinterpreted at time of recall or are stored in memory differently than expected and intended. The recall pattern for the vehicle messages also followed a pattern. Three months later, several adolescents remembered alcohol as a component of the message; likely associating the vehicle with anti-drunk driving messages they had previously seen.

Cold Blooded:

> "I think he was crashing into stuff he might have been drinking."
>
> "It was a car and I think a person was either smoking or drinking and they almost hit a child."
> "I guess he was drinking and talking on the cell phone and at the same time driving and causing danger to other people."

SUV:

> "They were in a car and it seemed like one of them was drunk or something like that."
>
> "The kids were sitting in the back seat and the wife was on the other side I guess he was drunk."

Even though the students were told the study was about smoking messages (see Youth Assent, Appendix F, and Telephone Survey Script, Appendix C) and answered questions about

their smoking behavior (see Appendix A), they still did not recall *Cold Blooded* and *SUV* as anti-smoking messages. Instead, the presence of a vehicle seemed to override the anti-smoking advocacy. It does not seem likely that the students reinterpreted the messages during recall, as the students were reminded that the study was about anti-smoking when the telephone interviewers called (see Appendix C). If they could not remember specifics of a message, they often said something like, "smoking is bad for you." It is more likely that the connection between the vehicle and drunk driving was made while the adolescents were watching the PSAs. The car/vehicle probably grabbed the attention of these adolescents, likely a highly accessible object as 14 and 15 year-olds are counting down the days until they can get their drivers' licenses. Adolescents also receive a lot of messages against drinking and driving. Not only are their national campaigns created by the Ad Council and Mothers Against Drunk Driving (MADD), but organizations like Students Against Drunk Driving (SADD) are active in many high schools. In fact, adolescents use alcohol more than cigarettes or drugs (DHHS, 2007), making underage drinking and driving a major concern among parents, schools and communities. As another health issue often presented to them, it is not surprising that adolescents would assume a PSA with a vehicle in it was an anti-drinking and driving message, not an anti-smoking message.

Another important difference between message types is that SHP messages were rated as more biased than PT messages. The PT PSAs used in this dissertation are representative of anti-smoking PT PSAs used with young adolescents and this result is consistent with previous work that has found PT messages to be lower in perceived bias than other types of messages (e.g., Cin et al., 2004). The results of other studies out of the larger grant project this dissertation was part of have also found PT messages are perceived as less biased than informative or second-hand smoke messages. Interestingly, in this dissertation, even those with highly accessible anti-

cigarette (not just pro-cigarette) attitudes rated PT PSAs as less biased than SHP PSAs (PT *m* = 2.10, *sd* = 1.20; SHP *m* = 2.53, *sd* = 1.32). It may be the surprise/twist ending itself that increases perceptions of bias as adolescents may view the PSAs as less truthful or more manipulative by hiding the true advocacy for the majority of the message. Importantly, and as discussed above, perceptions of message bias was negatively and significantly related to delayed unaided recall.

At least as a one-shot message, personal testimonies continue to be the best strategy. Young adolescents are more likely to process and remember PSAs with a narrative structure, ultimately meaning the information from these types of messages has a chance to impact attitudes and behavior. On the other hand, second-half punch messages may be extremely ineffective based on the higher perceptions of bias and lower recall found in this study. In addition, Niederdeppe (2005) found that SHP messages did not increase message elaboration younger teens (aged 12-15); this result was only found for older teens (aged 16-18). Depending on other elements in the message, adolescents may even be confused about the true topic/advocacy, resulting in wasted campaign resources. It is important to note, that the SHP PSAs used in this study may not be characteristic of all SHP messages. As outlined above, messages can be considered as having a second-half punch if the plot *or* the topic has a surprise ending or twist. And while the topic twist significantly decreased young adolescents' message retention, how a plot twist impacts message retention cannot be determined from this study and further examination is required. Ultimately, using a topic twist in a message aimed at young adolescents is probably not the best strategy in terms of message and cost effectiveness. These messages result in less retention and may require the adolescent to be exposed to the message multiple times. It could be the case that repeated exposure to SHP PSAs increases message retention; watching the message several times provides the exposure needed to figure out how to

put the information (story) together. Repeated exposure could also have a negative impact on PT messages; adolescents may become bored with it because they know what comes next.

Identifying the best message type is particularly significant as many health-related organizations do not have the public relations/marketing/advertising budgets equivalent to corporations. It is difficult for them to purchase ad space at the same high volume levels and many resources are channeled into other areas (i.e., policy change, fundraising, research, medical treatment, ect.). As mediated messages are never guaranteed to reach their intended messages at all, let alone multiple times, strategic dissemination is needed to increase chances of exposure (Salmon & Atkin, 2003).

Measurement of Mediated Message Recall

In order to get the best assessment of if and how messages are being remembered, unaided recall measures should be used. Aided recall will provide more a higher recall frequency, but the rate of false recalls may not be able to be determined, leading to inaccurate results. I am unaware of any studies that employ an unaided recall strategy when assessing delayed PSA recall. Studies that have measured delayed recall have either used recognition or aided strategies often because the researchers are interested in specific messages or information (e.g., Niederdeppe, 2005; Niederdeppe et al., 2007). However, messages that feature highly accessible content are remembered more frequently by adolescents – whether the content relates to the advocacy for the adolescent or something else entirely (i.e., drunk driving). Therefore, if they cannot recall a message by unaided means, it is likely the topic/advocacy is not important to them, meaning they will not engage in the advocacy. Thus, using unaided recall, even when the target message(s) is not mentioned, provides the best assessment of memory for that message(s).

Study Limitations

While this dissertation offers many insights into adolescent perceptions and recall ability of health PSAs, there are also several limitations. First, even though participation rate for Phase II of the study was better than half (63.2% of the original sample), the low N may explain why some analyses were non-significant. For example, only 12.8% of the participants reported a pro-cigarette attitude making compressions within that attitude and between attitude valance more difficult and unreliable. However, the low number of pro-cigarette attitude participants likely accurately reflects this population, since approximately 19% of high school students (across all grades) in Georgia smoke cigarettes (GDHR, 2005). In addition, reported smoking behavior of the 30 days prior to the study was low, with approximately 17% reporting smoking at all, which may also reflect low sampling error on this variable.

The demographics of the adolescents may also be considered a limitation. First, participants were only sought out from high school located in counties with median household income ranges of $26,223 to $43,514 (USDA, 2009). Low-income populations are underrepresented in communication research and understanding differences in communicative behavior is important, but a comparison between low- and middle-income students would also provide important insights. Particularly in terms of smoking behavior, as low-income, rural, Southern teenagers have higher than average smoking rates (e.g., Atav & Spencer, 2002; Sarvela, et al., 1997). Second, only high school freshman (*m* age = 14.75 years, *s.d.* = .06, median = 15) were recruited. As a difference in recall between younger and older adolescents is likely (Adams, 1991; Bjorklun & de Marchena, 1984; Niederdeppe, 2005), a direct comparison is necessary and should be examined in future research. Third, only differences between African American and White students could be examined. It would have been interesting to include participants of more

racial/ethnic backgrounds; particularly because Latino/a adolescents have a higher smoking prevalence rate than African American adolescents (CDC, 2007b). Finally, as not all ninth grade students participated at each school, nonresponse error could exist.

The way in which the adolescents viewed the PSAs may also be a limitation. First, viewing was done on laptop computers in a lab setting in high school classrooms, which may have encouraged more positive responses (i.e., trying to be a good participant) to some items. Second, Messages were embedded in the survey participants were responding to, not during a regular television program, so they may have paid more attention to them then they would typically. Second, messages were only viewed once. While this study provides a description of recall ability for PSAs viewed a single time, it is not able to describe how a message is perceived or recalled when it is viewed several times. A longitudinal study that accounts for repeated exposure, both in lab and natural settings, is needed to assess these affects. In addition, in a study such as this where message exposure is known, unaided recall could be assessed first, followed by an aided recall assessment (i.e., "Do you remember the ad with the cowboy?"). Direct comparison would allow several things: a) incidence of false recall could be compared among the two methods, b) any additional recall by aided means could be assessed, and c) suggestions could be made for when each method is appropriate to use.

Participants who only participated in Phase I of the study were different from participants that participated in both phases on only one of the major variables, however, that variable—message elaboration—turned out to be a key one. Adolescents who participated in *both* phases reported elaborating more on the PSAs than those who only participated in the first phase (see Table 4.1). Elaboration appears to moderate attitude accessibility's influence on future message

recall, but these results may not have been found if all original participants were included. Additional studies are needed to confirm the results of this study.

Overall, the PSAs were perceived as relatively low in bias. While SHP messages were perceived as more biased than PT messages, a more pronounced difference was expected. The low bias scores may be due in part to the design of the study. Instead of viewing both types of messages, adolescents either saw three PT or three SHP messages. The novelty of SHP messages may have worn off; after the first message adolescents may not have felt betrayed finding out the message topic at the end. Or, as all participants were well aware of the study topic, the surprise/twist may not have been as dramatic at the time of message exposure because the topic was already known. In addition, whether consciously or unconsciously, adolescents may have compared PSAs to each other when rating them (i.e., This message is a little less biased than the last, so I'll rate it low).

Finally, not including attention as a measured variable in the study may also be a limitation. Adolescents had to have paid attention to at least parts of the message in order to correctly recall it later. According to the model of attitude accessibility (Fazio, 1986; Roskos-Ewoldsen, 1997), those with highly accessible attitudes about the message topic would pay more attention to the PSAs than those with less accessible attitudes. Attention, in turn, increases both message elaboration and biased message processing (i.e., perceiving the message more positively or negatively). Not having a measure of attention may at least partially explain why attitude accessibility did not have a significant impact on delayed unaided recall. Even though in a lab setting with privacy screens, students could have been excited by the novel situation and lacked focus on the study.

Future Research

The results of this dissertation provide insight into how young adolescents retain health-related mediated messages; and how attitude accessibility and message perceptions in particular impact message retention and future recall. However, both the findings and limitations of this study provide areas for future research. First, in addition to conducting another longitudinal study, message recall should be assessed at multiple points in time and employ both unaided and aided cues. Measuring message recall immediately, one week later, one month later, and three months later will provide comparisons within subject and an idea of how quickly messages are forgotten (since this population had a difficult time recalling any of the messages). Using both unaided and aided cues will allow for a comparison of these two measurements, clarifying which provides a better measure of message retention at that specific point in time (i.e., immediately after, one month after, ect.). Similarly, adolescents should be exposed to the same PSAs multiple times before the recall measure in order to further investigate the impact of message type on retention and recall. As previously mentioned, SHP messages may be remembered more accurately after several exposures and PT messages may become too predictable. Measuring current smoking behavior and behavioral intent to smoke each time message retention is assessed may also provide information on changes in behavior, even though smoking behavior did not significantly impact message retention in this study. Future research should also include other populations. As mentioned in study limitations, more races and ethnicities should be included because smoking behavior among them varies. Finally, to better understand differences in how young adolescents and older adolescents perceive and retain messages, a study comparing high school and college students should be conducted. While this is only a short list of the directions

future research can take, each would provide additional insight into message retention and, ultimately, message effectiveness.

Conclusion

The goal of this dissertation was to examine attitude accessibility's effect on delayed unaided recall of anti-smoking PSAs in young adolescents. While a direct relationship between attitude accessibility and message recall was not established, the moderating effect of message elaboration was found. In addition, biased message processing and message type reduced delayed unaided recall. As there were several limitations, strategies for future research were outlined, including measuring attention and examining the affects of repeated exposure.

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Endnotes

[1]The latter of the sample questions was originally intended to serve as a decision tree item so the response to that question would later (after viewing each PSA) determine whether participants received a "this ad made we want to quit smoking" or "this ad made me never want to start smoking". However, because of an error in the computer programming, the majority of the participants received the "quit" question regardless of their previous response. This item was therefore not a reliable measure.

[2] Youth Opt Out Forms were also provided to students. Signing the form and returning it to their teacher, counselor or principal meant they would not be called out of class to participate in the study if their parent(s) had signed the parental consent form. The form can be found in Appendix G.

[3] Based on the original code book, messages could also be incorrectly recalled. An incorrect recall would entail recalling part of a message (e.g., teens in the back of a car like in *SUV*) but mixing it with something that did not happen in the message (e.g., one teen tried to get the other to smoke). The difference between incorrectly recalling a message and simply not recalling a message is theoretically interesting, but not considered in this project. Few students incorrectly recalled a message (27 responses out of 732) so those responses were removed from analyses.

[4] Kendall's tau-c could not be calculated for *Cold Blooded* because no student was able to recall the health advocacy. Health advocacy, therefore, acted like a constant.

[5] In the larger grant project, emotional responses to the PSAs was measured by having participants respond to a modified version of Dillard and Peck's (2001) scale. However, the majority of the responses fell on the extremes (either 1 = strongly disagree or 7 = strongly agree) and no significant results were obtained in analyses for another project.

APPENDIX A

List of Measures

Pre-PSA Measures

Attitude Accessibility *(Created by Grant Team, Y2)*

For the following items, please choose whether you like or dislike the thing on the screen.

Practice Items

- Disney World
- NASCAR racing
- Dancing
- Atlanta
- Recycling
- Britney Spears
- Church
- Credit cards
- Laundry
- Chew/dip
- Cell phone
- Clothes shopping
- Walmart
- Beer
- Candy
- Pickles
- Tuna fish
- Video games
- MTV
- Guitars
- Guns
- Flowers
- School
- Mexican Food
- Skipping Class
- Exercising

Experimental Items

- College
- TV
- Coke
- Large dogs
- Hip-hop music
- Gas prices
- Pizza
- Hurricane
- Peanut butter
- Marlboro
- Dairy Queen
- President Bush
- Spiders
- Rock music
- Broccoli
- Shopping
- Football
- History
- **Cigarettes**
- Parties
- Friends
- Studying
- Miller Lite
- Lying

RT = milliseconds
LD: 1 = like, -1 = dislike

Current Tobacco Use *(CDC, Global Youth Tobacco Survey, 2008)*

1. During the past 30 days (one month), on how many <u>days</u> did you smoke cigarettes?
    1. 0 days
    2. 1 or 2 days
    3. 3 to 5 days
    4. 6 to 9 days
    5. 10 to 19 days
    6. 20 to 29 days
    7. All 30 days

2. During the past 30 days (one month), on the days you smoked, how many <u>cigarettes</u> did you usually smoke?
    1. I did not smoke cigarettes during the past 30 days
    2. Less than 1 cigarette per day
    3. 1 cigarette per day
    4. 2 to 5 cigarettes per day
    5. 6 to 10 cigarettes per day
    6. 11 to 20 cigarettes per day
    7. More than 20 cigarettes per day

<u>Immediately Post-Message Measures</u>

Biased Message Processing *(Witte, 1994)*

Next we want your opinions on the ad you just saw. There are no right or wrong answers, just your opinion.

3. The ad was boring.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

4. The ad was overstated.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

5. The ad was overblown.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

6. The ad was exaggerated.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

7. The ad distorted the information.
   Strongly Disagree Strongly Agree
   1 2 3 4 5 6 7

8. The ad tried to manipulate my feelings.
   Strongly Disagree Strongly Agree
   1 2 3 4 5 6 7

9. I felt like I was being taken advantage of when I watched the ad.
   Strongly Disagree Strongly Agree
   1 2 3 4 5 6 7

10. While watching the ad, I felt it was not very truthful.
    Strongly Disagree Strongly Agree
    1 2 3 4 5 6 7

Message Elaboration *(Message Elaboration, Created by Grant Team, Y1)*

11. When watching this ad, I did not want to think about smoking.
    Strongly Disagree Strongly Agree
    1 2 3 4 5 6 7

12. Watching this ad made me really think about the bad parts of smoking
    Strongly Disagree Strongly Agree
    1 2 3 4 5 6 7

*(Heuristic Information Processing, Griffin, Neuwirth, Giese, & Dunwoody, 2002 **modified from original)*

13. This ad had more information about smoking than I personally need.
    Strongly Disagree Strongly Agree
    1 2 3 4 5 6 7

*(Systematic Information Processing, Kahlor, Dunwoody, Griffin, Neuwirth & Giese, 2003 **modified a lot from original)*

14. I thought about how this ad related to other things I know about smoking.
    Strongly Disagree Strongly Agree
    1 2 3 4 5 6 7

15. I thought about what I might do based on this ad.
    Strongly Disagree Strongly Agree
    1 2 3 4 5 6 7

Prior Viewing (*Created by Grant Team, Y3)*

16. I've seen <u>this</u> ad before. 1 2 3
Yes Maybe No

17. I've seen ads <u>like</u> this before. 1 2
Yes No

Demographic Items

18. I am 1_____ Female 2_____ Male

19. My Age is _____

20. Which race or ethnicity best describes you? Check only one. *(NIH, 2001)*

I am 1_____ African American/Black 4 _____ American Indian

2_____ Asian or Pacific Islander 5 _____ Hispanic

3_____ White 6 _____ Other (describe please)

<u>12 Week Follow-Up Measures</u>

(administered by phone)

For this next section, I want you to think back to when you participated in the study at school. You watched several public service announcements on the computer and you rated them.

I'm now going to ask you questions about those. Instead of using the phrase 'public service announcements', I'm going to call them 'ads'.

21. Do your remember any of the ads you saw that day at school?
1 = yes, 2 = no

Take a minute to think. I bet you can remember at least one of the ads you saw. [*Pause*].

22. Now do you remember any of the ads you saw?
1 = yes, 2 = no

23. Okay, describe one of the ads you remember. (open-ended response)

24. What else do you remember about that ad? (open-ended response)

APPENDIX B

Description of Anti-Smoking PSAs

Second-Half Punch

Cold Blooded: A white businessman drives a high-end black car. He presses a button in his car marked "Phone" and starts talking. While talking business, he hits a bicycler. The biker flies over the car, and his bike becomes lodged under the car. The driver keeps talking business and driving. Next, we hear the driver ask, "How's it going to affect our profits?" Then, he speeds through a crosswalk full of pedestrians. As his car hits around 5 people, he keeps driving and looks in his rear-view mirror. He flashes a frown but keeps driving. He then says, "That's all I care about." At the end, the viewer sees the license tag of the black car, and learns that it reads "TOBACCO." The car drives away and a black screen with the message "Tobacco companies make billions selling a product that killed 4.9 million last year."

Crawling Babies: The number 135 in red-orange is shown. Then you see a mechanical baby crawling and crying on a sidewalk in a large city. The cries and mechanical dolls multiply to hundreds as we see a man putting them on the street. A baby then falls over, and the message on the bottom is exposed: "How do infants avoid second hand smoke?.... At some point they begin to crawl." We then zoom out to see the hundreds of mechanical babies with about 5 or 6 people standing amongst them. Screen says "Knowledge is contagious." We can still hear the mechanical babies. The last screen says "Infect Truth."

SUV: An African American family is riding in their SUV. Two kids (teen boy and a younger girl) are in the back listening to headphones and sleeping. The mother is in the passenger seat, the father is driving. The son makes a face and says, "Whoa Whoa- something's funky." An announcer states, "Passing gas can be deadly." The mom scolds her husband with "ohhhh-ohhhh- honey! Not in the car." The announcer talks about how gasses are poisonous. "Kids shouldn't be exposed to second hand smoke." Dad is driving with a steady stream of cigarette smoke in front of him. He puts out the cigarette and looks shamed. Announcer says, "Don't pass gas, take it out side." The last screen has the web address dontpassgas.com and a phone number provided on the screen.

Personal Testimony

Cowboy: This PSA has an old western feel. A white man states how he used to love the cigarette ads and commercials because they exuded independence, rugged manliness, and freedom. The first screen is of a farm backdrop with a "The Truth" in large letters. This fades away to various photos and video clips that convey the beauty and freedom of the Wild West. We see an emotionally pained man who says "Then the cowboy died. Got lung cancer from smoking." We find the cowboy was the Marlboro man and was the speaker's brother. He talks about how the smoking industry used his brother. We see pictures and videos of the cowboy at

first healthy, then lying on a hospital bed with tubes in him. He is very fat and has several tubes attached to his body due to cancer. We are warned to not buy into the smoking company's marketing.

Pam Laffin: A woman states she started smoking as a young person, and got hooked. She also got asthma, bronchitis, and emphysema. She still did not quit. She did not quit until she had to have a lung removed. She was 24 when all of this happened. Now 26, she tells the viewer that she will be on medication for the rest of her life. The medication gives her a "fat face" and a hump on her neck. In the end, she says she started smoking to look older. She then adds, "…and I'm sorry to say, it worked." This ad starts with her going up an elevator. It progresses by giving a photographical account of her life from healthy and young, to older and smoking, and finishes with her talking to the camera.

Victim Wife: The PSA focuses on an older man. He talks about how his wife always bugged him to quit smoking. She told him it was bad for him, made the drapes smell, and she even threatened to stop kissing him if he did not stop. He did not quit because it was his lungs and life. He then explains that he was wrong – instead of losing his life, his wife lost hers. The message "secondhand smoke kills 53,000 people every year" is shown. The message ends with the man saying that his wife was his life. He is obviously very upset and starts to cry.

APPENDIX C

Telephone Survey Script

INTRODUCTION

HELLO, my name is _____. I am calling on behalf of the University of Georgia's Southern Center for Communication Health and Poverty.

a. Is this [name of person]?
- o Yes
- o No → **Is [name of person] available?** If no → **Thank you very much, but I seem to have dialed the wrong number.** STOP

[Interviewer: If necessary, repeat the greeting after the correct person comes to the phone.]

We are collecting information from young people who participated in the "TV and Smoking Messages" study to learn how teens feel about anti-smoking public service announcements that are shown on TV. You probably remember the first part of this study when you watched several public service announcements on a computer at your school and then answered some questions about them.

[*Interviewer: Obtain confirmation from the respondent that they remember participating in the study at school.]*

You may also remember that you provided your phone number so that we could follow up with you about your smoking behavior and what you remember about the public service announcements you watched on the computer. That is why I am calling you today.

If you agree to participate in this survey, we will send you a $10 Visa card in the mail. We are not trying to sell you anything.

b. Is this a good time for you to take this 10-15 minute survey?
- o Yes → go to Informed Consent
- o No → **That's okay. I'll call you back another time soon**. STOP

INFORMED CONSENT

We are trying to learn more about young people's smoking behavior and what you thought about the smoking videos that you saw a few months ago. We want your opinions, so there are no right or wrong answers to these questions.

This survey should last between 10 and 15 minutes and your participation is voluntary. If you agree to participate, you will receive a $10 Visa card in the mail in appreciation of your time and willingness to talk with us. If at any point you want to stop the survey you may do so and I will not call you back to collect more information.

If there is a question that you cannot or do not want to answer just say so, and we will move on. All of the information that we collect from you is confidential and the only people that will have access to this information are the researchers at UGA and Macro International who are conducting this study. All the information we collect will be kept on a secure network or in locked files. If you would like to contact the principal investigator of this study, you can ask for the contact information at any time during the interview. Please answer as truthfully as you can.

c. Do you agree to participate?

- o Yes → go to d.
- o No → STOP

d. What is your address so we can mail you your $10 Visa card?

Street address	
City	
State	
Zip code	

UNAIDED RECALL

For this next section, I want you to think back to when you participated in the study at school. You watched several public service announcements on the computer and you rated them.

I'm now going to ask you questions about those. Instead of using the phrase 'public service announcements', I'm going to call them 'ads'.

1. **Do you remember any of the ads you saw that day at school?**
   - o Yes → go to 24
   - o No → go to 23b

Take a minute to think. I bet you can remember at least one of the ads you saw. [*Pause*].

23b. Do you remember any of the ads you saw now?
- o Yes → go to 24
- o No → go to Part C

1st Free Recall Ad

24a. Okay, describe one of the ads you remember.
[Open Ended. Record comments]

24b. What else do you remember about that ad?
[Open Ended. Record comments]

2nd Free Recall Ad

25a. Describe another ad that you remember.
[Open Ended. Record comments] → if none, go to Part C

25b. What else do you remember about that ad?
[Open Ended. Record comments]

3rd Free Recall Ad

26a. Describe another ad that you remember.
[Open Ended. Record comments] → if none, go to Part C

26b. What else do you remember about that ad?
[Open Ended. Record comments]

CLOSING STATEMENT

That was my last question. Thank you very much for your time and cooperation. Everyone's answers will be combined to give us information about young people and smoking in the south.

If you have any questions about this study, please contact Dr. Jennifer Monahan at the University of Georgia, Southern Center for Communication, Health and Poverty. Her phone number is (706) 542-3257. Thank you.

APPENDIX D

Unaided Recall Codebook

Directions: Code each response (or unit) following the steps below. A unit equals each statement made in recalling. In other words, there will be one recall statement per message.

First, look at the students ID number and determine which condition (control or experiment) they should have been in (1 = experimental, 2 = control).

Next, code the 3 messages the student should have seen. If there is no unaided response for a message, assign a 0 (see below) for no recall.

If the student mis-recalls a message (i.e., recalls a PSA from the control condition when they were in the experimental), do not do anything with it for now. Just make note of the person's response by completing a code sheet.

Category	*Question*	*Code*	*Examples*
1. Message	What message is the student referring to? **Important Note: If you cannot tell which message it is supposed to be, fill out one of the code sheets with all information.	1 = Cold Blooded 2 = Crawling Doll 3 = SUV 4 = Cowboy 5 = Pam Baffin 6 = Victim Wife	
2a. Accuracy Level	Look at both health and non-health aspects of the message – how accurate is the message? **Important Note: If coded 0 (not recalled) here, then 2b must also be 0. If coded 2 (all) here, then 2b must be 1.	0 = not recalled 1 = some 2 = all	0 = "I don't know" or "I don't remember" 0 = Message cannot be identified e.g., "It had like a teenage kid on there and was smoking cigarettes." 1 = "In a car I know and there was gas or something."

			1 = “Something about cigarettes.” 2 = “This man old guy who smoked cigarettes and his wife told him not to and she died from second hand cigarette smoke.”
2b. Accurate Health	If some, was the health aspect accuracy recalled? (i.e., did they get that the message was about secondhand smoke and not drinking) But simply saying the message was about smoking is not enough (they know that’s what the survey’s about).	0 = no 1 = yes	0 = “The kids were sitting in the back seat and the wife was on the other side I guess he was drunk.” 0 = “I remember the old man crying. He was sad ‘cause his wife smoked and died.” 0 = “There was babies cryin’, their moms died.” 1 = “He was on his cell phone and the bike rider flipped over and something like how many people die each year from smoking.” 1 = “The lady said smoking made her fat and old.”

APPENDIX E

Parental Consent

Your child is invited to participate in a research study titled "TV and Smoking Messages." This study is being conducted by Dr. Jennifer Monahan from the Department of Speech Communication at the University of Georgia. Dr. Monahan can be reached at (706) 542-3257 or by email at jmonahan@uga.edu. All of the 9th graders at your child's school are invited to participate in this study.

The purpose of this study is to learn how teens feel about anti-smoking public service announcements that are shown on TV. This information will help others improve the TV ads that are produced to prevent smoking in young people.

This study has 2 parts. The first part of the study - Part 1 - will take place at school. It will take about 1 hour. Your teen will be using headsets and working on a laptop computer to answer some questions about themselves and about tobacco use he or she sees in his or her daily lives. Then, he or she will also watch some TV public service messages and give his or her opinion about them.

For Part 2 of the study, a researcher will call your teen by phone about 3 months after Part 1. During the phone call, the researcher will ask your teen what they can remember from the TV messages they watched at school. They will also ask your teen questions about themselves and about smoking behavior. If a researcher is unable to connect via phone with your teen, the researcher will be available for in person interview with your teen at school.

Other important things you should know before you sign this form:

A. Your teen's participation is voluntary; your teen can refuse to participate or stop taking part at any time without giving any reason and without penalty. He or she can also choose not to answer any questions that he or she feels uncomfortable answering.

B. Your teen's answers are *confidential.* Any information your teen provides will be used for research purposes only. The researcher can link your teen's name to his/her responses to questions. However, the researchers will not share that information with anyone, including you or their teachers, unless required by law.

C. Although the risks of participating in this study are minimal, some teens might feel some discomfort when answering questions about smoking. If someone who knows your child sees or hears their responses to the questions in the study, it could be uncomfortable for your child. We will do everything we can to protect your child's information.

D. Your child will receive a $10 gift card for participating in any or all of Session 1. Your child will also receive a $10 gift card for participating in the follow up phone call 3 months later. Your teen may also learn about the risks of smoking.

E. If you have any questions now or later about this study, please contact Dr. Jennifer Monahan at (706) 542-3257 or email her at jmonahan@uga.edu. You can also leave a message for the researcher with your child's teacher and the researcher will call you back.

I agree to allow my teen to participate in the "TV and Smoking Messages" study.

I am the natural parent and/or legal guardian of _____ (print name of child here) and am legally authorized by the laws of the state of Georgia to sign on behalf of this child. I have been given a copy of this form for my records.

Your relationship to the teen: _____

Name of Parent or Legal Guardian _____

(Print name)

Signature of Parent or Legal Guardian _____ _____

(Signature) Date

What phone number should we use to call your teen in April/May? _____

Is there a second phone number we could use to call your teen in April/May? _____

Researcher: Jennifer L. Monahan _____ _____

Telephone: 706 542-3257 Signature Date

Email address: jmonahan@uga.edu

Please sign both copies. Keep one and return the other to the researcher.

Additional questions or problems regarding your child's rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu).

APPENDIX F

Youth Assent

Dear Teen:

You are invited to participate in a research study titled "TV and Smoking Messages." The purpose of the study is to learn how teens feel about anti-smoking public service messages that are shown on TV. The study has two parts. The first part takes place in school during class time and takes approximately 1 hour. You will be asked to answer some questions about yourself. Next we will ask you to watch three TV public service messages on a computer and tell us what you think about each one. At the end of the first session, we will ask for your phone number and address so we can call you back in 3 months to do the follow up session. For the second part of the study, a researcher will call you on the phone about 3 months from now to ask you more questions about the study about yourself. The phone call will take approximately 15 minutes.

Your responses will be confidential. That means any answers that you give **will not** be shared with anyone. We will not share your responses with your parents, your teachers or anyone else. Instead, your answers are used only for research purposes without any names attached. The only time we would tell anyone what you said is if we were ordered to by law.

Although the risks of participating in this study are minimal, some teens might feel uncomfortable when answering questions about smoking. Also, if someone who knows you sees or hears your responses to the questions in the study, it could be uncomfortable for you. So we will do everything we can to protect keep your information private.

Your participation in this study is *voluntary*. That means you can choose not to participate or stop participating in the study at any time without telling us why you want to stop without any penalty. If you want to stop participating, just let the researcher know at any time. If there is a specific question you don't want to answer, you can skip that question.

You will receive a $10 gift card for participating in the first part of the study at school, even if you decide to stop before you finish. You will also receive a $10 gift card for participating in the follow up phone call 3 months from now. You will also learn about smoking risks and your personal attitudes toward smoking.

If you have any questions or concerns while you are participating, you can ask one of the researchers. If you have any questions after you participate, you can contact Jennifer Monahan (jmonahan@uga.edu or at (706) 542-3257 and she will be happy to answer your questions. If you want a copy of the findings of this project, you can email or phone Jennifer Monahan and she will be happy to send a copy to you.

Jennifer L. Monahan
Department of Speech Communication
University of Georgia, Athens, Georgia 30602
Telephone: (706) 542-3257 Email address: jmonahan@uga.edu

I understand the study described above. My questions have been answered and I agree to participate in this study. I have received a copy of this form.

_____	_____	_____
Your Name (Print)	Your Signature	Date

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

APPENDIX G

Youth Opt Out Form

Dear Teen:

You are invited to participate in a research study titled "TV and Smoking Messages." The purpose of the study is to learn how teens feel about anti-smoking public service messages that are shown on TV. Please see the Youth Assent form for information about the benefits and risks of participating in this study.

- If you do *not* want to participate, please sign this form and no one will call you out of class to participate in the study.

- If you do want to participate or if you are unsure if you want to participate, please do *not* sign this form and you will given the opportunity to participate in this study at school.

I choose *not* participate in this study. By signing this form I understand that I will *not* be called out of class to participate in this study.

_____	_____	_____
Your Name (Print)	Your Signature	Date

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

APPENDIX H

Debriefing Statement

Thank you for your participating in our study. The purpose of this study is to learn about how people view anti-smoking public service announcements (PSA) that are on TV. As you know, smoking remains a major health problem in our country and researchers are trying to find out the best ways to a) prevent people from beginning to smoke and b) getting them to quit if they currently smoke.

The purpose of this study was to better understand people's decision making process and attitude toward smoking, as well as the effects of media messages. We want to assess what kind of social factors are related to risk behavior intentions. We also want to know your attitude toward smoking. By conducting a phone survey in 12 weeks, we will also want to compare what kind of PSAs created anti-smoking attitudes and affected smoking intentions.

The information you provided us with will help us to understand which types of messages work best for which types of people. We hope to provide this information to people who create these messages. Thus, you're participation today was extremely valuable.

Again, we thank you for your time today. If you have any further questions, please contact:

Dr. Jennifer L. Monahan
(706) 542-3257
jmonahan@uga.edu

Elisabeth Bigsby
(706) 542-9360
ebigsby@uga.edu