

**MOVING BEYOND FEAR: EXPLORING PERCEPTIONS OF  
THEORY-BASED GRAPHIC WARNING LABELS AMONG LOW-  
INCOME, URBAN SMOKERS**

by  
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## ABSTRACT

**Background:** Research supports the greater impact of graphic warning labels than text-only labels on cessation behaviors; however, few studies have looked at the effectiveness of specific content. Evidence-based communication and behavioral theories and constructs—particularly efficacy beliefs, risk perceptions, and perceived similarity to characters—in label design might enhance their persuasiveness. Moreover, few studies have explored graphic warning labels among low socioeconomic status (SES) populations in the U.S. The aim of this dissertation was to develop and explore perceptions of theory-driven graphic warning labels among low-income smokers in Baltimore, Maryland.

**Methods:** From January-February 2014, qualitative interviews were completed with 25 low-income smokers, who were purposively sampled from a community-based population by age group (<40 versus  $\geq$ 40 years) and gender. Participants were asked about their perceptions of the labels, perceived influence on efficacy beliefs, risk perceptions, and motivation to quit, and perceived similarity to the characters. Interview transcripts were coded using a deductive and inductive approach in *Atlas.ti* v.7, and data were analyzed using the framework method, a thematic analysis using a matrix structure for data reduction.

**Findings:** Efficacy messages in which participants vicariously experienced the characters' quit successes were reported as most influential to self-efficacy beliefs, and viewing characters as role models for quitting was also reported as motivational for quitting. High threat labels were reported as increasing perceived risk from smoking and

causing fear and worry about the risks, and these high risk perceptions and negative emotional reactions to the labels were reported as being very motivational. Findings also highlighted ways in which the characters and perceived similarity to characters might enhance or diminish the influence of labels on efficacy beliefs, risk perceptions, and motivation. Labels depicting negative effects from smoking were most often reported as motivational, compared to labels depicting the benefits of quitting, with some differences in reporting by participants' quit attempt status.

**Conclusions:** This research contributed to the growing literature exploring graphic warning labels in the U.S. and suggested new approaches for the design of theory-based labels to promote cessation. It also contributed valuable information on perceptions of graphic warning labels among low SES populations.

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## **CHAPTER 1: INTRODUCTION AND SPECIFIC AIMS**

## **Background**

### *Prevalence of smoking and secondhand smoke exposure*

Smoking continues to be the leading preventable cause of morbidity and premature mortality in the U.S. and globally (U.S. Department of Health and Human Services, 2014; World Health Organization, 2012). After publication of the 1964 Surgeon General's report, in which smoking was identified as a cause of morbidity and mortality, smoking prevalence in the U.S. declined sharply from 51% of men and 34% of women, and the smoking prevalence gap between men and women narrowed (National Center for Health Statistics, 2010). However, downward trends have slowed over the past two decades (National Center for Health Statistics, 2010). As of 2012, 18% of U.S. adults are current cigarette smokers, a small decline from 21% in 2005 (Centers for Disease Control and Prevention, 2014). The prevalence is higher among men (21%) than women (16%) and highest among adults aged 25-44 years (22%) and 45-64 years (20%) (Centers for Disease Control and Prevention, 2014).

Exposure to secondhand smoke also contributes to the public health burden of smoking. As of 2007-2008, 40% of U.S. nonsmokers aged  $\geq 3$  years are exposed to cigarette smoke, totaling 88 million people (Centers for Disease Control and Prevention, 2010). Secondhand smoke prevalence is highest among children aged 3-11 years (54%) and youth aged 12-19 years (45%). Nearly all of those who live with a smoker are exposed.

Although much progress has been made in U.S. tobacco control, more work is needed to reach the Healthy People Goals to reduce current smoking by adults to 12%

and the proportion of children and youth exposed to secondhand smoke to 47% and 41%, respectively, by 2020 (U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion, 2014).

### *Health & economic burden of smoking*

Globally, direct tobacco use causes an estimated 5.1 million deaths per year according to 2004 estimates (the most currently available), which is nearly one in every eight deaths among adults aged  $\geq 30$  years (World Health Organization, 2009, 2012). Over 600,000 deaths are caused each year by secondhand smoke exposure, most of which in women (47%) and children (28%) (Öberg, Jaakkola, Woodward, Peruga, & Prüss-Ustün, 2011). In the U.S., more than 480,000 premature deaths and 5.2 million years of potential life lost on average each year are attributable to smoking (Centers for Disease Control and Prevention, 2008; U.S. Department of Health and Human Services, 2014). The total economic burden from smoking, accounting for productivity losses and direct healthcare expenditures, is \$193 billion per year in the U.S. (Centers for Disease Control and Prevention, 2008).

Smoking causes numerous cancers, respiratory and cardiovascular diseases, stroke, reproductive effects, and other conditions (U.S. Department of Health and Human Services, 2010, 2014). As of 2000 (the most current estimates), an estimated 8.6 million U.S. current smokers and former smokers are living with serious illnesses attributable to cigarette smoking, the most common of which are chronic bronchitis, emphysema, all cancer (except lung), stroke, and lung cancer (Centers for Disease Control and



Prevention, 2003; U.S. Department of Health and Human Services, 2014). Moreover, secondhand smoke causes significant morbidity and mortality in children and adults who do not smoke, including sudden infant death syndrome, respiratory infections and severe asthma in children, and cancer and coronary heart disease in adults (U.S. Department of Health and Human Services, 2006, 2014).

There is no safe level of exposure to tobacco smoke, even if the exposure is occasional or secondhand (U.S. Department of Health and Human Services, 2014). Risk and severity of smoking-attributable disease is strongly correlated with the amount and duration of exposure (U.S. Department of Health and Human Services, 2014).

### *Smoking cessation*

To reduce the burden of smoking and secondhand smoke exposure, an important component of a comprehensive tobacco control strategy is promotion of smoking cessation. Cessation is beneficial for smokers at any time, no matter their age or length of time as a smoker (U.S. Department of Health and Human Services, 2010). For example, risk of heart attack declines sharply after just one year of quitting, and risk of lung cancer mortality drops by half after 10 years.

As of 2010, 69% of adult U.S. smokers want to quit smoking, and about half made a quit attempt in the previous 12 months (Centers for Disease Control and Prevention, 2011). However, very few current smokers and former smokers who quit in the previous year (6%) are able to stop smoking for 6 months or longer. Despite a desire to quit, smokers experience great difficulty in quitting. To reach the U.S. Healthy People

Goals of 80% of adult smokers attempting to quit and 8% achieving success for 6 months or longer by 2020, further work is needed in tobacco control policy to motivate quit attempts and help smokers achieve cessation (U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion, 2014).

*Racial and socioeconomic disparities in smoking & cessation*

Despite declines in smoking in the U.S., significant disparities by race/ethnicity and socioeconomic status (SES) persist in prevalence and cessation (Fagan, Moolchan, Lawrence, Fernander, & Ponder, 2007). According to a 2012 national survey, the prevalence of current smoking is highest among adults aged  $\geq 18$  years who self-identify as having multiple races (26%) and lowest among Asians (11%). A slightly higher percentage of non-Hispanic White adults smoke (20%) compared to African American adults (18%) (Centers for Disease Control and Prevention, 2014). After adjusting for socioeconomic and demographic factors, African Americans have lower odds of current smoking than Whites (Barbeau, Krieger, & Soobader, 2004; LaVeist et al., 2008).

Despite a lower smoking rate than Whites, African Americans are less likely to have quit success. More African Americans are interested in quitting (76%) and attempted to quit in the previous 12 months (59%) compared to Whites (69% and 51%, respectively), according to a 2010 national survey (Centers for Disease Control and Prevention, 2011). However, fewer achieved recent short-term cessation (quit within the previous 12 months for  $\geq 6$  months) compared to Whites (3% versus 6%) (Centers for Disease Control and Prevention, 2011). Using national survey data from 1990-2000,

King, Polednak, Bendel, Vilsaint, and Nahata (2004) found that Whites are significantly more likely than African Americans to be former smokers (quit for at least 1 year). Contributing to cessation disparities may be that African American smokers have lower odds of being screened for tobacco use or advised to quit smoking by healthcare professionals as well as lower odds of using quit aids in the past year during a quit attempt (Cokkinides, Halpern, Barbeau, Ward, & Thun, 2008).

SES may play a more significant role than race/ethnicity in smoking prevalence and cessation disparities (Barbeau et al., 2004; King et al., 2004). In an adjusted analysis using a 2000 national survey, Barbeau et al. (2004) found that individuals with lower income levels and educational attainment are significantly more likely to be current smokers than those with higher income and education. Lower SES is also associated with increased risk of smoking initiation and progression to regular smoking, as well as reduced likelihood of cessation (Barbeau et al., 2004; Gilman, Abrams, & Buka, 2003). According to the 2012 national survey, 25% of those without a high school diploma and 28% of those living below the poverty line currently smoke compared to 9% of those with undergraduate degrees and 17% of those living at or above the poverty line (Centers for Disease Control and Prevention, 2014).

As well as a greater burden from smoking, African Americans and low SES individuals have a higher burden from secondhand smoke. According to the 2008 national survey, 56% of African Americans are exposed to secondhand smoke compared to 40% of Whites and 29% of Mexican-Americans (Centers for Disease Control and Prevention, 2010). An even greater disparity exists by poverty status: 61% of individuals

living below the poverty line are exposed to secondhand smoke compared to 37% of individuals living at or above the poverty line.

In addition to individual-level SES factors, people who live in economically deprived neighborhoods experience significant disparities in smoking status. Individuals who live in low SES or deprived neighborhoods are at increased risk of smoking, even after adjusting for individual-level characteristics (Dragano et al., 2007; Ellaway & Macintyre, 2009; Frohlich, Potvin, Gauvin, & Chabot, 2002). These area-level smoking disparities may be due to residents using smoking as a coping mechanism for stress and as a shared behavior that fosters community norms favorable toward smoking, significant barriers to quitting, and isolation from factors that encourage cessation (Chow et al., 2009; Stead, MacAskill, MacKintosh, Reece, & Eadie, 2001). In addition, the tobacco industry has a history of targeting advertisements in low SES neighborhoods (Hackbarth, Silvestri, & Cosper, 1995).

Public policy at the local, state, national, or international level is a highly effective means to reduce smoking through prevention and cessation on a large scale using regulation and economic measures (World Health Organization, 2004). An important element of comprehensive tobacco control policy is the regulation of tobacco product packaging to include pictorial health warning labels about the risks of smoking (World Health Organization, 2003, 2011b).

### *Overview of graphic warning labels globally*

Article 11 of the World Health Organization Framework Convention on Tobacco

Control (FCTC) requires tobacco product packaging to have no deceptive messages and contain health warnings on at least 30% of the principal display areas (World Health Organization, 2003, 2013). Other recommendations for the warning labels include, for example, having a picture, being large, clear, visible and legible, written in the principal language(s) of the country, and rotating. Implementation of warnings on 50% or more of the principal display areas is considered best practice. FCTC Implementation Guidelines recommend the use of full-color pictorial warnings (henceforth referred to as graphic warning labels) that depict the health effects of tobacco exposure, advice on cessation, addictiveness of tobacco, adverse economic and social outcomes, and impact of tobacco use on important others (World Health Organization, 2011a). Prior to the FCTC, text-only warning labels were the most common way to provide health information on tobacco product packaging worldwide. Including the U.S., 120 countries still use text-only labels (Hiilamo, Crosbie, & Glantz, 2014). As of 2012, 30 countries representing 14% of the world's population have requirements for health warning labels at the highest level of practice; that is, they have graphic warnings covering at least 50% of packaging and complying with all major characteristics outlined in Article 11 (World Health Organization, 2013). Most of these countries are middle-income. Forty-nine countries have graphic warning labels of any size (Hiilamo et al., 2014).

### *Warning labels in the U.S.*

In the U.S., the first warning label to appear on cigarette packs was required by the Federal Cigarette Labeling and Advertising Act of 1965, which was later amended by

the Comprehensive Smoking Education Act of 1984 to mandate the use of more warnings (Centers for Disease Control and Prevention, 2012; "Comprehensive Smoking Education Act," 1984). Four rotating text labels, labeled as Surgeon General's Warnings, were required on cigarette packages and advertisements warning about (a) what diseases smoking causes the smoker (lung cancer, heart disease, emphysema, and pregnancy complications), (b) what negative fetal effects it causes when smoked by a pregnant woman (fetal injury, premature birth, low birth weight), (c) carbon monoxide in smoke, and (d) quitting to improve health.

The Family Smoking Prevention and Tobacco Control Act of 2009 gave the U.S. Food and Drug Administration (FDA) legal authority to regulate tobacco products, including packaging and labeling (Deyton, Sharfstein, & Hamburg, 2010; "Family Smoking Prevention and Tobacco Control Act," 2009). In 2011, the FDA approved regulations that required the display of nine rotating graphic warning labels on the top 50% of the front and rear panels of cigarette packaging beginning in September 2012 (U.S. Food and Drug Administration, 2012). The law mandated nine text statements to accompany pictures, some of which were adapted from the four warning statements from the 1984 Act and others that added new information including that (a) cigarettes are addictive, (b) tobacco (secondhand) smoke can harm children, and (c) smoking can kill ("Family Smoking Prevention and Tobacco Control Act," 2009). In addition to the warning statement and picture, the U.S. Quitline number must be displayed.

These graphic warning labels would have been the first changes to the U.S. warning labels on cigarette packages in over 25 years (U.S. Food and Drug

Administration, 2012). However, implementation has been delayed after R.J. Reynolds sued the FDA and the D.C. Circuit Court ruled in favor of the tobacco company, citing that the FDA did not provide substantial evidence that the warnings would directly reduce smoking rates (Tobacco Control Legal Consortium, 2013). New studies are needed to design and test new graphic warning labels to replace the nine previously proposed labels.

*Summary of evidence for graphic warning label effectiveness*

Scientific evidence supports that graphic warning labels are more effective at promoting smoking cessation than text-only labels (Hammond, 2011, 2012). Firstly, graphic warning labels can have a significant impact simply by detracting from the attractiveness and attention paid to the branding on cigarette packaging (Hoek, Wong, Gendall, Louviere, & Cong, 2011; Strasser, Tang, Romer, Jepson, & Cappella, 2012).

Secondly, graphic warning labels can be a prominent source of health information for smokers to promote cessation-related cognitions and behaviors (Hammond, 2011; Hammond, Fong, McNeill, Borland, & Cummings, 2006). For example, calls to the national Quitline increased in Australia and quit attempts increased and smoking prevalence decreased in Canada after adoption of graphic warning labels (Azagba & Sharaf, 2013; Miller, Hill, Quester, & Hiller, 2009). Observational and experimental studies have shown that graphic warning labels promote short-term (attitudes, beliefs, knowledge), intermediate (intentions to quit), and longer-term behavioral (quit attempts) changes (Bansal-Travers, Hammond, Smith, & Cummings, 2011; Borland, Wilson, et al.,

2009; Cantrell et al., 2013; Kees, Burton, Andrews, & Kozup, 2010; Miller, Quester, Hill, & Hiller, 2011).

Although strong evidence supports the superior effectiveness of graphic warning labels over text-only labels, limited research has examined what content of graphic warning labels is most effective (Hammond, Reid, Driezen, & Boudreau, 2013; Hammond et al., 2012; Thrasher, Arillo-Santillan, et al., 2012). Much of the development of label content has relied on fear appeals using vivid depictions of the negative consequences of smoking (Hammond, 2011). Fear is an important pathway to increase cessation, and research has shown that fear and other strong affective responses to the labels are positively associated with cognitive reactions (e.g., credibility), greater risk perceptions, intentions to quit, and future quitting behaviors (Emery, Romer, Sheerin, Jamieson, & Peters, 2014; Hammond, Fong, McDonald, Brown, & Cameron, 2004; Kees et al., 2010). However, negative emotions alone may not create positive behavior change. Indeed, a study of the nine final labels selected by the FDA showed that they elicited negative affective responses, but did not increase intentions to quit (U.S. Food and Drug Administration, 2010).

In addition to negative emotional reactions, efficacy messages and individuals' efficacy beliefs are important for behavior change, according to several risk communication and behavioral theories (Bandura, 1982; Rimal & Real, 2003; Witte, 1992; Witte & Allen, 2000). However, they have received little attention in the graphic warning label literature. The limited evidence has shown very little impact of existing labels on increasing smokers' self-efficacy beliefs (Berg et al., 2011; Hammond et al.,



2004; Romer, Peters, Strasser, & Langleben, 2013; Schneider, Gadinger, & Fischer, 2012). This may be largely due to the lack of development of efficacy messages (Cismaru & Lavack, 2007). Evidence suggests some smokers may be engaging in fear control behaviors in response to graphic warning labels, such as avoidance of the labels (Borland, Wilson, et al., 2009; Hammond et al., 2004). A greater focus on efficacy messages may help to address engagement in fear control behaviors in reaction to labels and promote engagement in cessation behaviors.

Another critically important aspect of graphic warning labels often overlooked in the literature are people's perceptions of the characters in the pictures, particularly their perceived similarity to the characters. Perceived similarity is "the degree to which an individual perceives that he or she is similar to a character" (Moyer-Gusé, 2008, p. 410). Research has shown that perceived similarity to the character portrayed in a health message can increase the message's persuasiveness, information retention, and favorable attitudes toward the message (Andsager, Bemker, Choi, & Torwel, 2006; Appiah, 2001; Hoffner & Buchanan, 2005; Moyer-Gusé, 2008). Similarity may be particularly important in the face of a high threat message, because it can help overcome avoidance and reduce resistance (Moyer-Gusé, 2008; Silvia, 2005). Moreover, similarity to characters can enhance feelings of self-efficacy to perform behaviors modeled by the characters (de Graaf, 2014). Perceptions of characters and similarity to the characters could be highly useful in the design and evaluation of new labels.

## **Rationale for Research**

There is a critical need to develop and implement new graphic warning labels for cigarette packaging because of label “wear-out.” Labels are most effective when they are first adopted, at least partially because their newness attracts attention, and their effectiveness diminishes over time (i.e., “wears out”) (Borland, Wilson, et al., 2009; Hammond et al., 2007). Therefore, exploring new graphic warning label designs is necessary to guide countries in their adoption of new labels.

The lack of theory-driven design of graphic warning labels is a missed opportunity to design effective content. In particular, the limited work on efficacy messages and perceptions of characters are significant gaps in the research. Using behavioral theories to create and explore smokers’ responses to self-efficacy and response efficacy messages would add greatly to our understanding of how labels might be used to influence efficacy beliefs and, consequently, increase engagement in cessation behaviors. Moreover, the characters pictured on the labels likely have a significant influence on message acceptance and persuasiveness, but this has not been studied to date. By exploring perceptions of the characters and factors that play a role in perceived similarity to the characters, we can not only better understand how labels influence smokers’ attitudes and behaviors but also identify new approaches to enhance the impact of labels. Only cognitive processing of labels at the very highest level was found to predict cessation behaviors (Hammond, Fong, McDonald, Cameron, & Brown, 2003). By using well-established theories to develop and explore labels, we might be able to engage more people in high cognitive processing of the labels.

Much of the research on graphic warning labels has been conducted in an international setting and few studies have been conducted in the U.S. Moreover, limited research has been conducted with low SES populations or populations living in deprived neighborhoods, and much of it has simply focused on testing the impact of the labels compared to higher SES populations (Cantrell et al., 2013; Thrasher, Arillo-Santillan, et al., 2012; Thrasher et al., 2010). While important, this work fails to engage low SES populations at the formative research stage; that is, it does not sufficiently develop and qualitatively explore graphic warning labels with this population. The 2010 formative research study that guided the FDA's selection of the nine final labels for the U.S. (that were ultimately struck down in court due to lack of evidence) contained sample sizes of minority (<22% of study sample) and low SES (<2% of study sample with less than a high school diploma, <12% with income <\$25,000 per year) populations that were too small to obtain precise estimates for these populations (U.S. Food and Drug Administration, 2010). Addressing the research gap of limited formative work among low SES smokers and smokers living in deprived neighborhoods may be critically important for reducing smoking disparities in the U.S. and worldwide.

This dissertation will address the gaps in the literature by developing and exploring perceptions of theory-based labels, including their risk and efficacy messages and characters, and the perceived influence of the labels on risk perceptions, efficacy beliefs, and motivation to quit among low-income smokers in Baltimore, Maryland, U.S.

## Theoretical Perspective

As discussed above, the use of well-established social and behavioral theories in the design and research of graphic warning labels can substantially contribute to the body of literature and inform national policy. This dissertation study is informed by four communication and behavioral theories and theoretical constructs that are well-supported by research: the **extended parallel process model** (Witte, 1992; Witte & Allen, 2000), **risk perception and attitude framework** (Rimal & Real, 2003), **self-efficacy** (Bandura, 1982, 2004), and **perceived similarity to characters** (Moyer-Gusé, 2008).

### *Extended parallel process model and risk perception attitude framework*

The extended parallel process model (EPPM) is a risk communication theory positing that the threat of a health condition portrayed by a health communication message is important for cognitive or behavioral changes to occur (Witte, 1992; Witte & Allen, 2000). Characterization of the **threat components** of a message includes **severity of the condition** as well as the individual's **susceptibility to the condition**. The objective of the message is to increase individuals' fear of the threat so that they are motivated to take action. If the message contains no threat, individuals are unlikely to be motivated to act. The **efficacy components** of a message determine how individuals will react to the fear appeal. Characterization of the efficacy components includes the effectiveness of the recommended response (i.e., **response efficacy**) and the individual's ability to successfully perform the recommended response (i.e., **self-efficacy**).

If the message contains a threat component but no efficacy component, individuals will be motivated to engage in **fear control behaviors** to cope with their fear and resist the message, such as rejection or minimization of the threat or becoming inattentive to the message. It can also result in reactance to the message in which individuals perceive that the message is trying to manipulate them and increase their engagement in the unhealthy behavior in reaction to that perceived threat to freedom. If the message contains both threat and efficacy components, individuals are likely to engage in the **danger control process**, in which they are motivated to protect themselves and minimize their risk by accepting the message and adopting the new behavior. Therefore, both the threat and efficacy components of a message are essential for cognitive and behavioral impact.

Complementing and building off EPPM, the risk perception attitude (RPA) framework posits that individuals' risk perceptions and efficacy beliefs are equally important to the properties of the health communication message (Rimal & Real, 2003). Individuals' risk perceptions and efficacy beliefs may influence how they react to the message, but may also be changed by the message. Messages that depict threat and efficacy must influence individuals' **perceptions of the severity** of the risk, **perceptions of their susceptibility** to the risk, beliefs that a behavior is effective at eliminating or reducing a health threat (i.e., **response efficacy belief**), and confidence in their ability to successfully perform the recommended behavior (i.e., **self-efficacy belief**) (Rimal & Real, 2003). The stronger the threat and efficacy information portrayed in a message, the

stronger the risk perceptions and efficacy beliefs and the greater the changes in attitude, intention, and behavior (Witte & Allen, 2000).

The RPA framework characterizes individuals as belonging to one of four attitudinal groups based on their risk perceptions and efficacy beliefs. Those with high perceived risk and high efficacy beliefs are characterized as having a **responsive attitude** and are most likely to adopt the action recommended in the message (Rimal & Real, 2003). In contrast, those with high perceived risk and low efficacy beliefs—characterized as having an **avoidance attitude**—are less likely to adopt the recommended action and more likely to try to remove their fear through denial of their risk, avoidance of the issue, or perceive a manipulative motive.

Similarly, the nature of the responses among those who perceive low risk from a message is determined by their efficacy beliefs. Those with low perceived risk and high efficacy beliefs are characterized by a **proactive attitude** and motivated to take action by their desire for prevention of disease rather than their perceived risk status. In contrast, those with low perceived risk and low efficacy beliefs are characterized by an **indifference attitude** and the least likely to take the recommended action because they believe the risk is not severe and/or that they are not vulnerable to that risk and, even if they were vulnerable, they do not believe they can avert the risk. In the absence of efficacy information in health communication messages, people rely on past experiences and beliefs to determine the response efficacy of and self-efficacy to perform a recommended action (Witte & Allen, 2000).

Public health researchers and program planners can use the RPA framework to segment the target audience (whose behavior they want to change) into the four attitudinal groups based on their risk perceptions and efficacy beliefs and develop health communication messages that are tailored for each group. For example, a tobacco control campaign might develop messages emphasizing quitting as an effective strategy to prevent disease (i.e., response efficacy) to target smokers with a proactive attitude, or emphasize the severity of smoking-related disease and smokers' susceptibility to this disease to motivate smokers with an indifferent attitude.

### *Self-efficacy*

As described above, **self-efficacy** is defined as an individual's confidence in his or her ability to successfully perform a behavior, including overcoming barriers to perform that behavior. Albert Bandura originally developed this construct as part of social cognitive theory (Bandura, 1982, 2004), and it has since been incorporated into many other social and behavioral theories, including EPPM, theory of planned behavior, protection motivation theory and others (Ajzen, 1991; DeBarr, 2004). Increasing self-efficacy can lead to increased motivation to perform a behavior, even when faced with obstacles, and the likelihood of long-term behavior change (Bandura, 1982, 2004). Individuals with high self-efficacy expect to accomplish positive outcomes, perceive obstacles as surmountable through improved self-management and perseverance, and continue in the face of difficulties (Bandura, 2004). However, individuals with low self-efficacy expect that their actions will lead to negative outcomes and perceive that their

efforts are futile in the face of obstacles and quickly give up. Therefore, high self-efficacy is necessary for healthy behaviors to be initiated and maintained.

There are four major sources of self-efficacy information: mastery experiences, social modeling, social persuasion, and physical and emotional states (Bandura, 2012). In **mastery experiences**, individuals build their self-efficacy by performing a task successfully. These tasks must be attainable and can be small steps on the road to a significant behavior change, such as reducing smoking frequency to build self-efficacy to quit smoking. However, the behavioral tasks must require perseverance to overcome obstacles in order to build resilient self-efficacy. Individuals who achieve early successes are easily demoralized when they face failures and setbacks. The **social modeling** approach occurs when individuals see others who are similar to themselves succeed in completing a task through perseverant effort and are rewarded for that effort. Observing modeling increases individuals' expectations that they can also perform the behavior and will have a positive outcome. Role models can be observed in-person or through the media, such as in print advertisements or television (Bandura, 2001).

In **social persuasion**, individuals are persuaded that they have the skills and capability to perform the behavior through greater, perseverant effort, even in the face of obstacles (Bandura, 2012). They should be encouraged to measure their success in terms of self-improvement, rather than their success over others. Lastly, individuals' **physical and emotional states** play a role in the formation of self-efficacy beliefs. Moods and emotional states (such as anxiety, depression, or stress) as well as physical states (such as strength and stamina) affect how individuals judge their abilities to perform a behavior in



a particular situation. Improving these states, as well as correcting individuals' misreading of their emotional and physical states, can increase self-efficacy.

### *Perceived similarity to characters*

According to the health communication literature, **perceived similarity** with a character portrayed in a media message can increase the message's persuasiveness, information retention, and favorable attitudes toward the message (Andsager et al., 2006; Appiah, 2001; Hoffner & Buchanan, 2005; Moyer-Gusé, 2008). Perceived similarity is "the degree to which an individual perceives that he or she is similar to a character" (Moyer-Gusé, 2008, p. 410). This definition implies an emic perspective of similarity, in which individuals judge their own similarity to characters, in contrast to an etic perspective in which outsiders judge the similarity between an individual and a character. Similarity may be particularly important in the face of a high threat message, because it can help overcome avoidance and reduce resistance (Moyer-Gusé, 2008; Silvia, 2005). Perceived similarity can enhance the effect of messages on feelings of susceptibility to health conditions by showing highly similar characters as vulnerable to the harmful effects of an unhealthy behavior (de Graaf, 2014; Moyer-Gusé, 2008; Rimal & Morrison, 2006).

In addition to influencing individuals' responses to messages, attitudes, and risk perceptions, greater perceived similarity may also lead to modeling of the character's behavior (Andsager et al., 2006; Hoffner & Buchanan, 2005). According to social cognitive theory, exposure to models of various behaviors, including those in the media,

can shape attitudes towards the behavior, affect perceptions about the acceptability and prevalence of the behavior (i.e., norms), and teach new behaviors (Bandura, 2001).

Individuals are more likely to imitate behavior learned from models if they observe the models receiving positive rewards, not punishments, for the behavior, particularly if they perceive themselves as similar to the model (Bandura, 2001). For example, models in the media that portray positive aspects of smoking (e.g., glamor, stress relief) promote attitudes favorable to smoking (Charlesworth & Glantz, 2005; Hines, Saris, & Throckmorton-Belzer, 2000; Watson, Clarkson, Donovan, & Giles-Corti, 2003).

Similarly, tobacco cessation may be effectively promoted in the media through models that portray the negative aspects of smoking (Chapman & Davis, 1997). Research has shown that similarity to characters can enhance feelings of confidence (i.e., self-efficacy) to perform behaviors modeled by the characters (de Graaf, 2014), desire to become like the characters (Hoffner & Buchanan, 2005), and engagement in the modeled behaviors (Fox & Bailenson, 2009).

Perceived similarity encompasses multiple dimensions, such as personality, beliefs, values, attitudes, behavioral tendencies and life experiences (Cohen, 2001; Hoffner & Buchanan, 2005; Moyer-Gusé, 2008). For example, Hoffner and Buchanan (2005) found that respondents felt similar to television characters that seemed similar in attitudes and had certain personality attributes (e.g., intelligent, successful). Demographic traits such as race, ethnicity, age, and gender may also be significant cues of similarity in media (Appiah, 2001; Hines et al., 2000; Hoffner & Buchanan, 2005). A study with adolescents found that African Americans perceived themselves to be more similar to

African American than non-Hispanic White characters portrayed in product advertisements (Appiah, 2001). Another study with young adults found that men and women have greater perceived similarity with television characters of the same gender than those of the opposite gender (Hoffner & Buchanan, 2005). Thus, demographic concordance between viewers and characters portrayed in health communication messages may enhance the impact of the messages on viewers' risk perceptions and efficacy beliefs through the construct of perceived similarity.

### **Study Aims**

The overall aim of this dissertation research is to explore perceptions of theory-based graphic warning labels and their role in risk perceptions, efficacy beliefs, and motivation to quit among low-income smokers in Baltimore, Maryland, U.S. (Figure 1.1).

The specific aims are:

**Aim (1)** To explore participants' perceptions of graphic warning labels with a threat message, an efficacy message, and a threat + efficacy message across several health topics and their role in risk perceptions and efficacy beliefs.

**Research question 1a:** What are the perceptions of labels with different levels of threat (high, low, or no threat) and different types of self-efficacy messages (mastery experience, social persuasion, social modeling)?

**Research question 1b:** What is the role of the labels in risk perceptions and self-efficacy beliefs?

**Research question 1c:** How does the role of the labels in self-efficacy beliefs differ by labels with an efficacy message + high, low, or no level of threat?

**Aim (2)** To explore participants' perceptions of their similarity (and dissimilarity) to the characters on graphic warning labels.

**Research question 2a:** What characters do participants perceive themselves as similar to, and what factors promote perceived similarity?

**Research question 2b:** What characters do participants perceive themselves as dissimilar to, and what factors promote perceived dissimilarity?

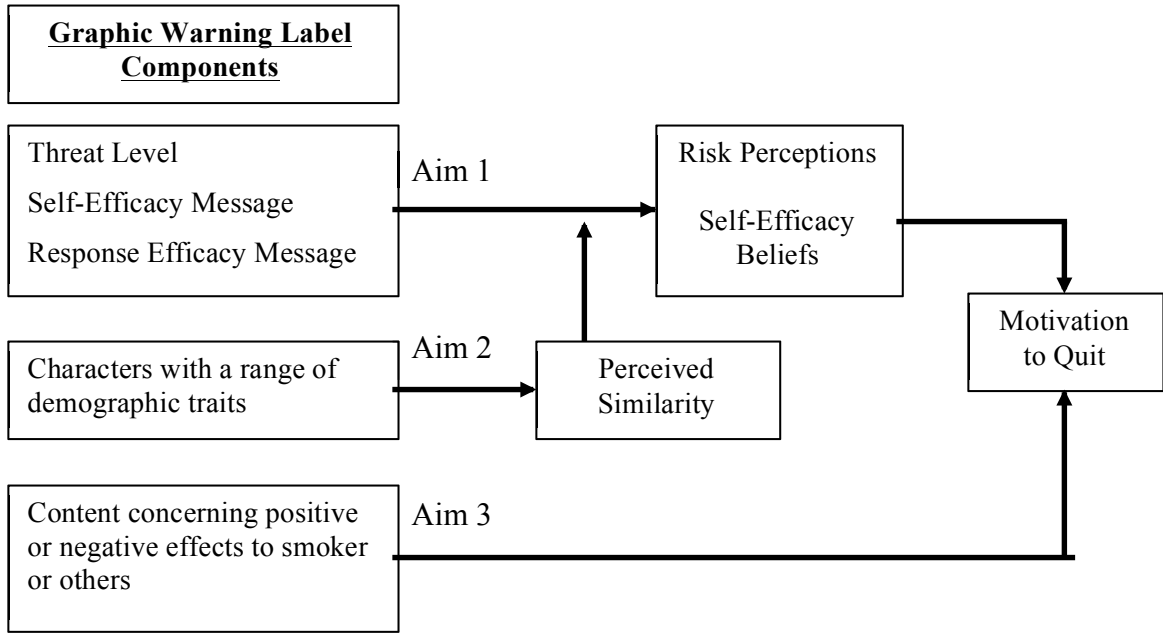
**Research question 2c:** What are participants' perceptions of the credibility of the characters, and what factors promote and inhibit credibility?

**Aim (3)** To explore the role of graphic warning labels in motivation to quit.

**Research question 3a:** What label content do participants perceive as influential on their motivation to quit?

**Research question 3b:** What factors inhibit the role of labels in motivation to quit?

**Figure 1.1.** Conceptual model of research aims



**Development of Graphic Warning Labels and Interview Guide**

Twelve graphic warning labels were either adapted from existing labels (from Canada, the U.S., Brazil, and Australia) or created using pictures purchased online (see Appendix A). Authorization was obtained from all countries for use and adaptation of their labels. All labels were standardized to include a warning title at the top, a picture on the left, and subtext on the right describing the negative effects of smoking, a response efficacy message about the benefits of quitting or using the Quitline, or a self-efficacy message. The U.S. Quitline number was included on all the labels. The warning statements mandated by U.S. law were used for the warning titles whenever possible.

Following EPPM (Witte, 1992), labels were developed to vary on threat and efficacy messages. The threat message varied on the level of threat portrayed, i.e., high, low, and none. Based on categorization used previously (Hammond et al., 2012), labels

with a highly vivid picture of the negative effects of smoking were categorized as portraying a high threat level (n=4), whereas labels with a nonvivid picture of the negative effects were categorized as low threat (n=4). Labels with a picture relating to a positive message about quitting were categorized as no threat (n=4). In addition to threat level, the threat message varied by the type of health effect: emphysema, gangrene, heart disease, cancer, premature birth, fatal lung disease in nonsmokers, secondhand smoke effects on children, and premature death.

Labels were also developed to contain response or self-efficacy messages. Following Bandura (2012), three types of self-efficacy messages were developed: (1) *mastery experiences* (enabling the person to succeed in attainable behavioral performances, such as delaying smoking); (2) *vicarious experiences* (seeing people similar to oneself succeed, such as the story of how a character quit); and (3) *social persuasion* (encouragement to exert greater effort towards the goal, such as affirming their power to quit). Response efficacy messages addressed the effectiveness of quitting on improving health and calling the Quitline in aiding cessation. These efficacy messages were combined with different threat levels to explore how labels with varying combinations of threat and efficacy influence efficacy beliefs. The threat and efficacy components are explored in **Research Aim 1**.

Pictures were selected purposively to portray a wide range of characters that differed based on gender, age group (<40 years versus  $\geq$ 40 years), and race (African American versus other, which was chosen due to the predominantly African American population in the recruitment area). Pictures were also selected to portray both characters

suffering from the negative health effects of smoking (i.e., negative characters) and characters showing the benefits of quitting (i.e., positive characters). The characters are explored in **Research Aim 2**.

To ensure a range of content, the labels fell into one of four categories: (a) negative depiction of the health effects of smoking to the smoker (n=4) (b) and to others (i.e., a child or adult nonsmoker; n=4), and (c) a positive message about quitting for the smoker (n=2) and (d) for others (n=2). These four content categories are explored in **Research Aim 3**.

The graphic warning labels (see Appendix A) and interview guide (see Appendix B) were pilot tested with five participants and staff at the Lighthouse Studies at Peer Point, a community-based research center that works with low SES populations with a high burden of intravenous drug use and HIV.

### **Dissertation Overview**

This dissertation research is a qualitative study in which in-depth interviews were conducted with 25 smokers recruited from low-income neighborhoods in Baltimore, Maryland. The dissertation is organized into six chapters, including three manuscripts.

#### *Chapter 1: Introduction*

The first chapter provides an introduction to the smoking epidemic globally and in the U.S., disparities in smoking and cessation, an overview of warning labels on cigarette packaging globally and in the U.S., and a brief overview of the evidence regarding graphic warning label effectiveness for smoking cessation. It also describes the

theoretical perspective that guides the dissertation, the rationale for the research, and the research aims.

### *Chapter 2: Literature review*

The second chapter provides an in-depth literature review of graphic warning label effectiveness, their impact in low SES smoker populations, and the relevance of the previously discussed theories and theoretical constructs for understanding graphic warning labels. The goal of this literature review is to critique the literature on graphic warning labels to identify gaps in research.

### *Chapters 3-5: Manuscripts 1, 2 and 3*

The next three chapters are the three independent manuscripts that present the research methods and findings of this dissertation research. Manuscript 1 addresses Aim 1 concerning the perceptions of graphic warning labels with threat and efficacy messages and their role in risk perceptions and efficacy beliefs. Manuscript 2 addresses Aim 2 concerning perceptions of similarity and dissimilarity to the characters portrayed on labels. Manuscript 3 addresses Aim 3 concerning the role of labels in motivation to quit.

### *Chapter 6: Discussion*

The last chapter presents a summary of the research findings and discusses the strengths and limitations, implications and recommendations for future research and policy, and the conclusions from the research.



## **CHAPTER 2: LITERATURE REVIEW**

## **Impact of Graphic Warning Labels on Smoking Cessation Behaviors**

Strong evidence indicates that graphic warning labels on cigarette packaging are more effective at promoting smoking cessation behaviors than text-only labels (Hammond, 2011). One avenue through which graphic warning labels can have a significant impact is simply by detracting from the attractiveness and attention paid to the branding on cigarette packaging (Hoek et al., 2011; Strasser et al., 2012). Product packaging is an important element of the tobacco industry's marketing strategy to promote the use of tobacco products, particularly given bans on other forms of advertising in many countries (Freeman, Chapman, & Rimmer, 2008; Wakefield, Morley, Horan, & Cummings, 2002). Tobacco companies design packages to establish brand imagery that promote ideals and values (such as status, attractiveness, and sophistication) and meet the psychological (such as obesity reduction) and psychosocial (such as personal image) needs of customers to sell products (Cook, Wayne, Keithly, & Connolly, 2003; Doxey & Hammond, 2011; Wakefield et al., 2002).

Packaging can influence individuals' attitudes and perceptions to promote use of that product. For example, colors on the pack convey different messages to smokers, such as lower cigarette strength and low tar (Wakefield et al., 2002). Both smokers and nonsmokers identify cigarette packs with text such as "light," "silver," and "smooth" as having a lower health risk and smoother taste, delivering less tar, and easier to quit (Bansal-Travers et al., 2011; Hammond, 2012; Hammond, Dockrell, Arnott, Lee, & McNeill, 2009; Hammond & Parkinson, 2009). Pictures of cigarette packs have been shown to elicit cravings in smokers (Carter et al., 2006). In short, pack designs can not

only attract consumers, but also impart incorrect health information and have cue reactivity properties that make cessation difficult. Large, prominent graphic warning labels may promote cessation by detracting from the branding elements.

Secondly, graphic warning labels can be a prominent source of health information for smokers to promote cessation-related cognitions and behaviors (Hammond, 2011; Hammond et al., 2006). At the population-level, smoking prevalence decreased and quit attempts increased in Canada after introduction of graphic warning labels (Azagba & Sharaf, 2013), and calls to the national Quitline in Australia increased after introduction of graphic warning labels, which contained the Quitline number (Miller et al., 2009). Experimental research has found that graphic warning labels reduce smokers' demand for cigarettes (Thrasher et al., 2007). Graphic warning labels can promote smoking cessation through cognitive and affective responses to the labels, recall of the labels, changes in short-term (attitudes, beliefs, knowledge, and motivation) and intermediate (intentions to quit) cognitive outcomes, and longer term behavioral change (quit attempts) (Hammond, 2011).

Intentions to perform a behavior are an important antecedent to behavior (Montaño & Kasprzyk, 2008), including quit attempts and other cessation behaviors (Hammond et al., 2003; Hyland et al., 2006). Experimental evidence has shown that graphic warning labels increase intentions to quit over text-only labels (Cantrell et al., 2013). Changes in attitudes, beliefs, and knowledge can lead to greater intentions (Ajzen, 1991), and research has shown that graphic warning labels produce self-reported changes in attitudes favorable to cessation, including making people think about the health risks of

smoking and about quitting, increasing their likelihood of quitting, and giving them greater confidence to quit (Bansal-Travers et al., 2011; Borland, Wilson, et al., 2009; Cantrell et al., 2013; Kees et al., 2010).

Messages from graphic warning labels are more effectively retained and recalled than text-only labels. Graphic warning labels increase knowledge of the health effects from smoking and tobacco constituents, and this knowledge is positively associated with quit intentions (Hammond et al., 2006; Miller et al., 2011; Mutti, Hammond, Reid, & Thrasher, 2013). After the introduction of new graphic warning labels that contained the Quitline number in Australia, awareness and recall of the Quitline number increased over time (Miller et al., 2011).

Strong cognitive and affective responses to the labels are an important part of the pathway to increase cessation using graphic warning labels (Hammond, 2011). Cognitive reactions to the labels, such as believability of the label, attentiveness to the label, and perceived impact of the label on self and other smokers, are associated with greater risk perceptions from smoking, lower desire to smoke, positive feelings towards quitting, and future quit attempts and quitting (Borland, Yong, et al., 2009; Emery et al., 2014; Hammond et al., 2003). Affective responses to the labels, such as fear, disgust, and worry, are positively associated with cognitive reactions as well as greater risk perceptions, lower desire to smoke, positive feelings towards quitting, intentions to quit, and future quitting behaviors (Emery et al., 2014; Hammond et al., 2004; Kees et al., 2010). Cognitive processing and responses to the labels are associated with increased knowledge of the risks from smoking and intentions to quit (Hammond et al., 2003;

Hammond et al., 2006). High levels of cognitive processing of labels, emotional and behavioral responses to labels, and intentions to quit have been found to longitudinally predict future engagement in cessation behaviors (Borland, Yong, et al., 2009; Hammond et al., 2004; Hammond et al., 2003).

In sum, strong observational and experimental evidence supports the greater effectiveness of graphic warning labels compared to text-only labels. However, research on the effectiveness of graphic warning labels among low socioeconomic status groups and on the most effective types of warning label content are more limited.

### **Graphic Warning Label Effectiveness Among Low SES Groups**

Graphic warning labels on cigarette packaging have potential to promote cessation in low socioeconomic status (SES) U.S. populations who have often been difficult to reach through tobacco control media campaigns (Niederdeppe, Kuang, Crock, & Skelton, 2008). Investigating graphic warning labels among low SES groups may be particularly important given the evidence of a health knowledge gap (Beacom & Newman, 2010; Viswanath & Finnegan, 1996). High SES groups are able to access health information from their environment more rapidly than low SES groups, and this knowledge gap is linked to health disparities (Beacom & Newman, 2010; Viswanath et al., 2006; Viswanath & Finnegan, 1996). Cultural and literacy factors play a role in how information is accessed, processed and used by groups (Beacom & Newman, 2010; Kreuter & McClure, 2004). Graphic warning labels may help address the health knowledge gap due to their use of pictures to impart information, their noticeability, and their universal presence on all cigarette packs.

Several studies have explicitly looked at differences in the effectiveness of graphic warning labels on cessation by SES factors, including educational attainment, income level, and health literacy (Cantrell et al., 2013; Hammond et al., 2013; Thrasher, Arillo-Santillan, et al., 2012; Thrasher, Carpenter, et al., 2012; Thrasher et al., 2010). Some evidence suggests a greater effect among low educated respondents. In a U.S. population, Thrasher, Carpenter, et al. (2012) found that graphic warning labels were rated as more credible than text-only labels among participants with low health literacy only. In another U.S.-based study, Cantrell et al. (2013) found that the effect of graphic warning labels versus text-only labels on cognitive responses and intention to quit was the same across income groups, but graphic warning labels had a stronger effect on intentions to quit among smokers with moderate education versus high education. A cross-sectional study comparing Uruguay, Brazil, and Mexico found that graphic warning labels had a bigger impact on cognitive and behavioral responses among low educated populations than those with higher education (Thrasher et al., 2010). In sum, the literature shows that graphic warning labels are more effective than text-only labels at promoting cessation-related responses and cognitions regardless of SES, but graphic warning labels may have an even bigger impact among those with low education and literacy.

### **Research on Graphic Warning Label Content**

Limited research has been conducted on the most effective graphic warning label content (Berg et al., 2011; Hammond et al., 2013; Hammond et al., 2012; Mays et al., 2014; Thrasher, Arillo-Santillan, et al., 2012; Thrasher, Carpenter, et al., 2012; Zhao, Nan, Yang, & Iles, 2014). In terms of format characteristics, adult smokers and youth

smokers and nonsmokers have rated labels with color pictures, pictures of real people, and Quitline information as more effective than labels with black-and-white pictures, comic book-style pictures and without Quitline information (Hammond et al., 2013).

The message content of current graphic warning labels on tobacco product packaging can be classified into four broad categories: graphic health effects (strong, vivid depictions of physical effects of tobacco use), lived experiences (portrayals of personal experience including social and emotional impact, or implications for quality of life), symbolic (use of abstract imagery), and testimonial (brief narrative from a person portrayed on the label about his or her personal consequences of smoking, accompanied by his or her name and age) (Hammond et al., 2012). Evidence suggests that more graphic, vivid depictions of the physical effects of smoking, particularly the external effects, are the most effective in changing individuals' cessation-related cognitions and behaviors (Berg et al., 2011; Hammond, 2011; Hammond et al., 2013; Hammond et al., 2012; Kees et al., 2010; Mutti et al., 2013; Thrasher, Arillo-Santillan, et al., 2012; Thrasher, Carpenter, et al., 2012; U.S. Food and Drug Administration, 2010). However, there may be substantial variation between individuals in their ratings; that is, some people rate vivid warnings higher than nonvivid, and some rate them lower (Hammond et al., 2013). These ratings may differ by gender, race/ethnicity, perceived descriptive norms, level of autonomous motivation, and self-efficacy (Berg et al., 2011).

Studies on the use of testimonials on graphic warning labels have shown mixed results regarding their perceived effectiveness (Berg et al., 2011; Hammond et al., 2013; Hammond et al., 2012; Thrasher, Arillo-Santillan, et al., 2012). Two studies found that

labels with testimonial information were rated moderately higher than comparable labels without testimonials (Hammond et al., 2013; Hammond et al., 2012). Another study found that labels with didactic information were rated higher on credibility, relevance, and impact than those with testimonials, but the difference was not significant among participants with lower education (Thrasher, Arillo-Santillan, et al., 2012). One study compared labels about the effects of smoking to others versus labels about the effects of smoking to self and found that labels with effects to others were rated higher than those with effects on self (Hammond et al., 2012).

In addition to format characteristics, vividness of pictures, testimonial information, and information about effects on self versus others, the framing of the content on graphic warning labels may be important. Research findings comparing loss-framed messages about the health consequences of smoking to gain-framed messages about the benefits of quitting have been mixed (Mays et al., 2014; Zhao et al., 2014). Mays et al. (2014) found that participants exposed to gain-framed messages on plain packaging (cigarette packs without any branding imagery) were more motivated to quit than those exposed to loss-framed messages, but differences were not seen for messages on packaging with branding. In contrast, Zhao et al. (2014) found that participants exposed to loss-framed warnings (on plain packaging) had higher levels of perceived effectiveness and negative emotions, less favorable attitudes towards smoking, and greater intentions to reduce smoking than participants exposed to gain-framed warnings.

The limited research comparing the effectiveness of various graphic warning label content by SES factors suggests few differences. Perceived effectiveness of different



format characteristics of graphic warning labels (such as color versus black-and-white pictures) does not appear to differ by household income or educational level (Hammond et al., 2013). Labels with vivid pictures are rated as more effective than those with nonvivid pictures across health literacy groups (Thrasher, Carpenter, et al., 2012). Labels with testimonial information are rated as highly as labels with didactic information among individuals with lower education; in contrast, didactic labels are rated higher among individuals with higher education (Thrasher, Arillo-Santillan, et al., 2012). No study to date has compared the impact of loss- and gain-framed labels by SES.

In sum, the few studies on graphic warning label content have had mixed findings in several areas, including the use of testimonial, narrative formats and message framing. Also, further work is needed to look at new ways to design labels. For example, no study to date has looked at testimonials with gain versus loss framing. Although labels with vivid pictures tend to be rated more highly than nonvivid pictures, there appears to be substantial variation (Hammond et al., 2013). Additional work is needed to compare the effectiveness of content by smokers' characteristics; for example, smokers' level of motivation to quit before viewing graphic warning labels may influence which types of labels they respond to more. Communication and behavioral theories and theoretical constructs, such as the extended parallel process model and self-efficacy, may aid in the development of effective labels (Strahan et al., 2002). Moreover, development and testing of labels within low SES populations has been limited. Further research is needed to design theory-based labels and qualitatively explore perceptions of these labels among low SES smokers.

## **Graphic Warning Labels and Risk Communication Theory**

Graphic warning labels can arouse negative emotional responses, such as fear, disgust, and discomfort (Hammond et al., 2004; Kees et al., 2010; Peters et al., 2007; U.S. Food and Drug Administration, 2010). They are also associated with fear intensity and perceived severity of the health consequences (Schneider et al., 2012). These emotional responses are associated with cognitive processing and perceived effectiveness (Hammond et al., 2004), and, specifically, fear evoked by the message is a significant mediator for the effect of the graphic warning label on intentions to quit smoking as well as quitting, attempting to quit, and reducing smoking three months later (Hammond et al., 2004; Kees et al., 2010). Fear may be more important than message recall in promoting pro-smoking cessation attitudes (Kees et al., 2010). Thus, graphic warning labels are most effective when they depict a high threat and evoke a high level of fear within the audience, which is consistent with the extended parallel processing model (EPPM) and risk perception attitude (RPA) framework literature (Rimal & Real, 2003; Witte, 1992; Witte & Allen, 2000). These theories may explain why labels with vivid pictures are often rated as more effective than labels with nonvivid pictures (Berg et al., 2011; Hammond, 2011; Hammond et al., 2012; Kees et al., 2010; Thrasher, Arillo-Santillan, et al., 2012; Thrasher, Carpenter, et al., 2012; U.S. Food and Drug Administration, 2010).

However, the role of efficacy message properties and efficacy beliefs in graphic warning label research has not received much attention in the literature. According to EPPM and the RPA framework, threat and perceived risk are important to motivate action, but message efficacy properties and perceived efficacy are critical to determine

whether individuals will adopt the recommended action or take another, defensive action (i.e., rejection, avoidance, and reactance) to eliminate their fear (Rimal & Real, 2003; Witte, 1992; Witte & Allen, 2000). A limited amount of research has examined the effect of graphic warning labels on defensive actions (Borland, Wilson, et al., 2009; Borland, Yong, et al., 2009; Hammond et al., 2004). Longitudinal research has shown that, although adult smokers self-reported engagement in avoidance behaviors of graphic warning labels (Borland, Wilson, et al., 2009; Hammond et al., 2004), avoidance was not associated with depth of cognitive processing of the label at baseline or cessation behaviors over time (Borland, Yong, et al., 2009; Hammond et al., 2004).

Drawing from risk communication theories, these findings suggest that efficacy may be playing a role in behavioral responses to graphic warning labels, but very few studies have investigated the role of self-efficacy and response efficacy beliefs (Berg et al., 2011; Romer et al., 2013; Schneider et al., 2012). Romer et al. (2013) found that perceived self-efficacy to quit significantly modified the effectiveness of graphic warning labels on intentions to quit among smokers, such that the labels were only effective in increasing intentions among smokers with high quit self-efficacy. This study illustrates the importance of increasing efficacy beliefs and suggests that the inclusion of efficacy messages in graphic warning labels may be beneficial, but further research is needed to test this hypothesis.

### **Label Efficacy Messages and Impacts on Efficacy**

Evidence has shown very little (or no) impact of current graphic warning labels on increasing the efficacy beliefs of smokers. One experimental study found that graphic

warning labels had no statistically significant effect on changing perceived quitting self-efficacy compared to text-only labels, but this finding may be attributable to the fact that the study used comic book style picture warning labels (Romer et al., 2013), which research has shown to be less effective than graphic health effect labels using real pictures (Hammond et al., 2013). Moreover, the labels included no efficacy message, and, in fact, the text accompanying the picture (“Studies have shown that tobacco can be harder to quit than heroin or cocaine”) is theoretically more likely to decrease than increase quitting self-efficacy. Hammond et al. (2004) found that most Canadian adult smoker respondents (73%) self-reported no impact of the graphic warning labels on their self-efficacy to quit. However, this study did not objectively or longitudinally measure changes in self-efficacy influenced by the graphic warning labels. An experimental study among German smokers found that four European Union graphic warning labels with a high threat message significantly increased perceived severity of smoking (a dimension of perceived risk), but had no impact on response efficacy or self-efficacy beliefs, compared to text-only labels (Schneider et al., 2012).

A cross-sectional study on graphic warning label properties found that smokers with higher self-efficacy in the face of external stimuli (e.g., ability to refrain from smoking when having a drink with friends) had slightly, but statistically significant, greater odds of selecting testimonial labels as most effective compared to labels portraying highly vivid health effects, and no association was found with self-efficacy in the face of internal stimuli (e.g., ability to refrain from smoking when feeling depressed) (Berg et al., 2011). This study implies that testimonial, as opposed to vivid health effect,

labels may have a greater impact on self-efficacy to quit. However, this study was cross-sectional and did not specifically assess the impact of labels on self-efficacy beliefs, so conclusions are limited. None of the studies discussed thus far looked at graphic warning label efficacy properties and their impact on efficacy beliefs and cessation behaviors, thus we cannot determine which, if any, label message attributes increase efficacy beliefs (Berg et al., 2011; Hammond et al., 2004; Romer et al., 2013; Schneider et al., 2012).

A 2007 review article looked at graphic warning label message properties and found that none of the Canadian graphic warning labels at the time contained efficacy messages, though they did include threat messages to influence risk perceptions (Cismaru & Lavack, 2007). The authors recommended the addition of self-efficacy and response efficacy messages to the labels to increase perceived self-efficacy and response efficacy. A qualitative study in France found that two efficacy-oriented messages on graphic warning labels—“get help to stop smoking” and “your doctor and your pharmacist can help you stop smoking”—were inadequate to increase efficacy beliefs in smokers (Gallopel-Morvan, Gabriel, Le Gall-Ely, Rieunier, & Urien, 2011). However, the authors failed to discuss how theory and evidence were used to develop the efficacy messages. Further work is needed to develop effective, evidence- and theory-based efficacy messages for graphic warning labels.

In addition to increasing efficacy beliefs, graphic warning labels have the potential to make smokers' current efficacy beliefs more salient when making a decision about whether or not to quit. Health psychology research has shown that an attitude towards a behavior will guide an individual's decision about whether or not to engage in

that behavior if the attitude is strongly accessible from the individual's memory (Fazio, Powell, & Williams, 1989). Graphic warning labels may help people access their perceptions of efficacy and, thus, help them attempt to quit based on their currently held efficacy beliefs.

Work is needed to develop evidence-based, theory-driven efficacy messages on graphic warning labels to promote cessation. No studies to date have developed labels with different levels of threat (i.e., high, low, or none) combined with several types of self-efficacy and response efficacy messages and qualitatively explored perceptions of these labels and their role in risk perceptions, efficacy beliefs, and motivation to quit. Lastly, additional research is needed to explore these labels with low SES populations to help address smoking disparities in the U.S.

**CHAPTER 3: MANUSCRIPT 1 – The influence of graphic warning labels on  
efficacy beliefs and risk perceptions**

**The influence of graphic warning labels on efficacy beliefs and risk perceptions: a qualitative study with low-income, urban smokers\***

*\*As of August 26, 2014, the manuscript is under review at Health Education Research*

**Abstract**

**Background:** Health communication theories indicate that messages depicting efficacy and threat may promote behavior change, but this has received little attention in graphic warning label research. To inform the development of labels to promote smoking cessation, this qualitative study explored perceptions of 12 graphic warning labels with quitting self-efficacy messages paired with messages portraying high, low, or no threat from smoking among low socioeconomic status (SES) smokers.

**Methods:** From January – February 2014, we conducted 25 in-depth interviews with low SES adult men and women smokers (n=25) in Baltimore, Maryland, U.S. Participants discussed the labels' role in their efficacy beliefs and risk perceptions. Data were analyzed through framework analysis.

**Findings:** Efficacy messages in which participants vicariously experienced the characters' quit successes were reported as most influential to self-efficacy beliefs. Labels portraying a high threat were reported as most influential to participants' perceived severity of and susceptibility to smoking risks. Efficacy messages alone and paired with high threat were seen as most influential on efficacy beliefs.

**Conclusion:** Role model-based efficacy messages may enhance the effectiveness of labels by making smokers' self-efficacy beliefs about quitting most salient. The findings



may aid in the development of labels to address smoking disparities among low SES populations in the U.S.

## **Introduction**

In the U.S. and worldwide, smoking is the leading preventable cause of morbidity and premature mortality (U.S. Department of Health and Human Services, 2014; World Health Organization, 2011). As of 2012, 18% of U.S. adults were current cigarette smokers (Centers for Disease Control and Prevention, 2014). The burden is heaviest among individuals with low socioeconomic status (SES) (i.e., living below the poverty line or with low educational attainment), who are more likely to be current smokers and less likely to quit or make a quit attempt (Barbeau et al., 2004; Centers for Disease Control and Prevention, 2011, 2014; Gilman et al., 2003).

An important element of comprehensive tobacco control policy is the implementation of pictorial labels warning about the health consequences of smoking on cigarette packaging, called graphic warning labels (World Health Organization, 2003; World Health Organization, 2011). A 2011 rule by the U.S. Food and Drug Administration (FDA) requires cigarette packaging to display nine approved graphic warning labels, but it has not yet been implemented (U.S. Food and Drug Administration, 2012).

Observational and experimental evidence have found that graphic warning labels are more effective than text-only labels at promoting smoking cessation behaviors, including increased calls to the national Quitline and quit attempts (Azagba & Sharaf, 2013; Hammond, 2011; Miller et al., 2009). Graphic warning labels can be a prominent

source of health information to promote short-term (attitudes, beliefs, knowledge), intermediate (intentions to quit), and longer-term behavioral (quit attempts) changes (Bansal-Travers et al., 2011; Borland, Wilson, et al., 2009; Cantrell et al., 2013; Hammond, 2011; Kees et al., 2010; Miller et al., 2011).

Much of the development of graphic warning label content has relied on fear appeals using vivid depictions of the negative consequences of smoking (Hammond, 2011). Research has shown that fear and other strong affective responses to labels are positively associated with cognitive reactions (e.g., believability), greater risk perceptions, lower desire to smoke, positive feelings towards quitting, intentions to quit, and future quitting behaviors (Emery et al., 2014; Hammond et al., 2004; Kees et al., 2010). However, negative emotions alone may not create behavior change. Indeed, the final labels selected by the FDA elicited negative affective responses, but did not increase intentions to quit (U.S. Food and Drug Administration, 2010).

According to the extended parallel process model (EPPM), graphic warning labels would be most effective when portraying both a threat that arouses fear as well as the efficacy of a recommended action to mitigate the threat (Witte, 1992; Witte & Allen, 2000). The threat message—characterized by severity of and susceptibility to a health condition—motivates action through fear. However, the efficacy message—characterized by response efficacy of the recommended action to reduce risk and self-efficacy to perform the action—determines whether the individual will engage in fear control behaviors (i.e., coping behaviors to reduce fear such as avoidance) or danger control behaviors (i.e., adoption of the recommended action).

Although efficacy messages and individuals' efficacy beliefs are important for behavior change (Witte & Allen, 2000), they have received little attention in the graphic warning label literature. The limited evidence has shown very little impact of existing labels on increasing smokers' self-efficacy beliefs (Berg et al., 2011; Gallopel-Morvan et al., 2011; Hammond et al., 2004; Romer et al., 2013; Schneider et al., 2012). This may be largely due to the lack of development of efficacy messages (Cismaru & Lavack, 2007). An experimental study found that graphic warning labels had no effect on changing quitting self-efficacy beliefs compared to text-only labels (Romer et al., 2013); however, the text accompanying the picture ("Studies have shown that tobacco can be harder to quit than heroin or cocaine") may be more likely to decrease self-efficacy than increase it. A qualitative study found two efficacy-oriented messages on graphic warning labels were inadequate to promote efficacy beliefs in smokers (Gallopel-Morvan et al., 2011). Evidence suggests some smokers may be engaging in fear control behaviors in response to graphic warning labels, such as avoidance of the labels (Borland et al., 2009; Hammond et al., 2004). A greater focus on efficacy messages may help to address this gap between graphic warning labels and cessation.

Investigating threat and efficacy messages on graphic warning labels may be particularly important among low SES populations given the evidence of a health knowledge gap (Beacom & Newman, 2010; Viswanath & Finnegan, 1996). High SES groups are able to access health information from their environment more rapidly than low SES groups, and this knowledge gap is linked to health disparities (Beacom & Newman, 2010; Viswanath et al., 2006; Viswanath & Finnegan, 1996). Cultural and

literacy factors play a role in how information is accessed, processed and used by groups (Beacom & Newman, 2010; Kreuter & McClure, 2004). Although graphic warning labels overall are more effective than text-only labels regardless of SES (Cantrell et al., 2013), the effectiveness of specific content (e.g., didactic versus testimonial information) may differ by SES (Thrasher et al., 2010; Thrasher, Arillo-Santillan et al., 2012). Further research is needed on perceptions of graphic warning labels and their threat and efficacy content among low SES smokers.

This qualitative study explored low-income, urban smokers' perceptions of graphic warning labels with efficacy and threat messages across several health topics. We developed different efficacy messages based on health communication and behavioral theories and explored perceptions of labels with a threat message, an efficacy message, and a threat + efficacy message, and their potential influence on risk perceptions and efficacy beliefs.

## **Methods**

### *Participants and setting*

Participants were 24 current smokers and 1 former smoker (who quit <3 months prior) who completed a survey for the Tobacco Influences in the Drug Environment (TIDE) study (Principal Investigator: C.L.), which aims to examine associations between tobacco use and attitudes and to identify communication channels that promote tobacco use and cessation among low-income smokers in Baltimore, Maryland. TIDE recruitment took place in low-income neighborhoods through street outreach and word-of-mouth by trained staff from the Lighthouse Studies at Peer Point, a community-based research

center that works with low SES populations with a high burden of intravenous drug use and HIV. This population was chosen because of its high smoking prevalence and significant barriers to cessation (e.g., managing stress without cigarettes). In Baltimore, smoking prevalence is highest among those in the lowest income (35%, <\$15,000 annual income) and educational (34%, less than college degree) groups (Baltimore City Health Department, 2010), and up to 58% in some areas (LaVeist, Thorpe, Mance, & Jackson, 2007). At the Lighthouse, unpublished data from three other studies showed smoking rates of 83-88%.

Participants were chosen using purposive sampling by gender and age group (18-39 and  $\geq 40$  years). We stratified by age to capture variations among younger (<40 years) and older ( $\geq 40$  years) smokers who may have different health concerns. Inclusion criteria were aged 18 years or older, smoked  $\geq 100$  cigarettes in lifetime, and smoked cigarettes in the past 30 days at the time of the TIDE survey.

### *Data collection*

The first author (E.M.) conducted in-depth interviews in a private office. The interviews lasted 1-2 hours and were audio recorded. Participants were shown 12 graphic warning labels and asked about their cognitive and affective reactions to each label (see Appendix A for labels and Appendix B for interview guide). They were then asked to select which labels showed the highest level of severity from smoking (i.e., perceived severity), showed a health effect likely to happen to them if they did not quit or made them worry the most about their smoking (i.e., perceived susceptibility), and made them

feel confident that they could quit if they wanted to (i.e., self-efficacy belief). For participants who initially selected all or most of the labels, the interviewer probed which labels were their top choices.

Age, gender, and race data were collected at the time of the interview. Marital status, educational level, employment status, income, smoking frequency, and quitting behavior data were collected during the TIDE survey. Participants provided written informed consent prior to the interview and were compensated with \$25 after completion. The Johns Hopkins Bloomberg School of Public Health Institutional Review Board approved the study.

#### *Graphic warning label and interview guide development*

Graphic warning labels were either adapted (with permission) from existing labels (from Canada, the U.S., Brazil, and Australia) or created (Table 3.1). Labels were standardized to include a warning statement at the top, a picture on the left, and text on the right describing either the negative effects of smoking or an efficacy message, and the U.S. Quitline number. The warning statements mandated by U.S. law were used whenever possible.

Following EPPM (Witte, 1992), labels were developed to vary on threat and efficacy messages (Table 3.1). The threat message varied on the level of threat portrayed, i.e., high, low, and none. Based on categorization used previously (Hammond et al., 2012), labels with a highly vivid picture of the negative effects of smoking were categorized as portraying a high threat level, whereas labels with a nonvivid picture of

the negative effects were categorized as low threat. Labels with a picture relating to a positive message about quitting were categorized as no threat. In addition to threat level, the threat message varied by the type of health effect (e.g., cancer, secondhand smoke effects).

Following Bandura (2012), three types of self-efficacy messages were developed: (1) *mastery experiences* (enabling the person to succeed in attainable behavioral performances, such as delaying smoking); (2) *vicarious experiences* (seeing people similar to oneself succeed, such as the story of how a character quit); and (3) *social persuasion* (encouragement to exert greater effort towards the goal, such as affirming their power to quit). Response efficacy messages addressed the effectiveness of quitting on improving health and calling the Quitline in aiding cessation. These efficacy messages were combined with different threat levels to explore how labels with varying combinations of threat and efficacy influence efficacy beliefs. The labels and interview guide were pilot tested with five participants.

### *Data analysis*

In *Atlas.ti v7*, the transcribed interviews were coded by the first author (E.M.) with a coding scheme that was developed using a combined deductive and inductive approach with input from two co-authors (J.C. and C.K.; see Appendix C.1 for final codebook and Appendix C.2 for sample coding). Analytic memoing was conducted to reflect on emerging themes or issues, including deviant cases. The framework method was used for analysis of the coded transcripts, which is a thematic analysis using a matrix

structure to systematically reduce the data (Gale, Heath, Cameron, Rashid, & Redwood, 2013). Following this method, codes were grouped into broader categories to begin the process of data abstraction, such as a category for efficacy-related codes. Next, data were charted into the framework matrix to provide accurate summaries by participant, category, and label. For example for each participant and label, responses were summarized for the codes within the efficacy category. Notes taken during the interviews as well as post-interview summaries were also considered to provide context. Broader themes were developed by comparing codes and categories within and across cases with special attention to deviant cases. To enhance rigor and transparency (Gale et al., 2013), the data were summarized by case within the matrix, thus keeping the data within the rich context of each case. The matrix structure facilitated the identification of patterns and included references to specific lines within the transcripts to easily ascertain the evidence supporting the themes.

## **Findings**

### *Study sample*

The 25 participants were on average 45 years old (range=22 to 61 years), 22 were African American, and 13 were female (Table 3.2). Many had not completed high school (n=12), had an income <\$10,000 during the previous year (n=16), were retired or unable to work for health reasons (n=16), and were either single (n=12) or married/partnered (n=12). The majority (n=23) reported smoking everyday in the previous 30 days, and 11 reported smoking <1 pack per day. Over half (n=14) had ever tried to quit, and among



these 14 participants 11 had made  $\geq 1$  quit attempts in the previous 12 months and 8 were currently trying to quit.

### *Reactions to efficacy messages*

Participants were asked about their reactions to self-efficacy messages on the labels, which included social persuasion, mastery experience, and vicarious experience (Table 3.1). Many participants responded favorably to social persuasion messages, which were designed to persuade individuals that they had the ability to quit. Participants stated these messages were credible and helpful:

It's like a lot of stuff is set out there, but you're not just quitting for yourself. [If] you want to be around your kids and stuff, you need to quit. It gives you a lot of hope... Yeah, I feel good just seeing you've got the power to quit, like you can do it. Like saying they did it and they're happy now (younger man).

For several participants, the message reminded them of their ability to quit, thus influencing their self-efficacy beliefs. Several other participants reported that these messages were not helpful or credible, citing difficulties in overcoming nicotine addiction.

Most participants reacted negatively to mastery experience messages, which were designed to suggest small behavioral steps towards cessation that individuals could master to increase their self-efficacy. One main reason was their lack of credibility – participants believed that the behavioral step would not be effective for cessation. In addition, participants did not think they had the ability to master the behavioral step and would need additional help; in other words, they had low self-efficacy. For example,

when asked about a message suggesting the delay of the day's first cigarette to facilitate cessation, one older woman stated: "No. I don't think so. I ain't got that happening... when I get up in the morning I have a cigarette. Then in like a good, I ain't even going to say a half an hour, probably 15 - 20 minutes I go smoke another one." Several participants stated that the mastery experiences were helpful for them and they might try the behavioral steps.

Many participants reacted positively to vicarious experience messages, which were designed to tell the stories of characters who quit as role models to influence self-efficacy beliefs. Participants reported that the characters' quit methods would be helpful for quitting, and often added methods, such as removing ashtrays, enforcing smoke-free home policies, and using nicotine replacement therapy. Moreover, they described the characters as role models to admire and emulate: "That one about Michael quitting before he set his quit date, he looks at his quit date and get rid of all his cigarettes. I think I can do that. When I really, really feel like it need to be done which is now, I think I can do it" (older man).

However, several participants stated that vicarious experience messages were not helpful. They said the character's method would not be effective. Underlying this statement for several participants seemed to be a belief that they did not have the ability to use that method successfully, that is, low self-efficacy:

No. I don't think that's true... I generally had to have something to help remove those urges, to stop those urges from being strong. Because the urges had become so overwhelming that it was just like I'd tell myself, well, I'm just going to take an inhale just to get it off of me... yeah, you ain't just going to just stay busy and stop smoking. That's not going to happen (older woman).

As illustrated above, this participant not only questioned the validity of the quit method but also her ability to use it without succumbing to her urges. The characters failed to be adequate role models of cessation for several participants.

#### *Perceived influence of labels on efficacy beliefs*

Participants were asked which labels made them feel more confident that they could quit smoking if they wanted to (i.e., quitting self-efficacy). No clear pattern emerged by the type of self-efficacy message. The two labels selected most often were both positive messages about quitting, but one had a social persuasion message (label #11) and the other had a response efficacy message about quitting (label #9). The major reasons for selecting the social persuasion label were that the characters were role models showing the benefits of quitting and the social persuasion message was motivating: “They triumphed. They’ve proven that people can stop smoking and that whole families can do it... Cigarette smoking can be stopped. It’s only an urge; that’s all it is” (older man). The overwhelming reason for selecting the response efficacy label was that the character was a positive role model for quitting and looked healthy after quitting: “You know, it make you say, ‘Wow, if he could quit at such a young age, you know, I should be able to quit’” (younger woman).

Six participants reported that none of the labels increased their quitting self-efficacy. Most of them had never tried to quit (n=4); in contrast, 12 of the 19 participants who selected  $\geq 1$  labels had tried to quit. Several had no desire to quit and were resistant

to the messages, doubting their credibility. Others expressed their desire to quit at some point in the future but had low self-efficacy to quit at the moment:

Cravings can stop you from quitting... because if you got these strong cravings and you know that you really want it, you ain't going to stop. You ain't going to stop. I'd be having like cravings sometimes too and it's like well, I need to smoke... you got your mind set on quitting but then here comes something else that make you [say], "oh, I need a cigarette" (younger man).

One participant reported that none of the labels affected her self-efficacy because she already had high self-efficacy.

Although no pattern emerged by the type of efficacy message, participants' discussions showed that they vicariously experienced the situations portrayed by the characters and role modeling played a role in shaping their self-efficacy beliefs. Five of the labels showed one or more characters who had quit smoking (labels #1, 9-12), and the majority of participants discussed at least one of these characters as a role model for quitting and living a healthy lifestyle: "This one [character on label #10] makes me proud that they was able to do it and I can do it too" (older woman). Even though this participant did not select this label as one that made her confident to quit, her statement illustrates how vicariously experiencing a quit attempt can influence self-efficacy.

We also explored how participants' perceptions may have been influenced by the portrayal of a high threat (i.e., containing vivid pictures), low threat or no threat from smoking-related conditions. When a label contained a self-efficacy message, participants most often reported that labels with no threat, followed by high threat then low threat, influenced their self-efficacy beliefs. Participants reported that high and low threat labels showed the negative effects from smoking and motivated them to quit to avoid those

conditions and improve their overall health. In contrast, participants stated that no threat labels showed characters who were role models for quitting and showed the effectiveness of quitting on improving health. They also stated that the labels made them more confident to overcome obstacles to quitting (e.g., cravings) and the self-efficacy text was motivating.

#### *Perceived influence of labels on risk perceptions*

Participants were asked which labels influenced their perceived severity of and susceptibility to smoking-related conditions. They most often reported that the labels portraying a high threat influenced their perceived severity of smoking, followed by low threat labels; only one participant reported no threat labels as influential. All participants perceived high severity from at least one high threat label. The picture was most often the reason for the label's influence, and other major reasons included negative emotional reactions (e.g., scared, anxious) and the clear provision of information. Some participants reported these labels as influential because they contained new information and because of the potential long-term health outcomes (i.e., diminished quality of life, irreparable physical damage, and death).

Participants most often reported feeling susceptible to the health conditions shown on the high threat labels, followed by low threat then no threat labels. Many participants reported that these labels influenced their perceived susceptibility because they were concerned about these conditions and wanted to prevent them, or they perceived high severity of the conditions. Other major reasons stated were that they have, or know

someone who has, a similar condition, and the labels stimulated them to contemplate how much physical damage smoking had caused to their bodies: “Because you wonder how close or how far you is to being that way. So if, like, you a little concerned, a lot concerned, you wonder how close you is to being like these people. You might don’t even know it” (older man). Several participants also selected labels showing conditions that they stated were inevitable if they continued to smoke.

In a notable case, an older female participant qualified her selections by stating smoking cigarettes is not the main cause of these conditions. She was the only participant to state none of the labels made her worry about her smoking. Indeed, throughout the interview she criticized the labels’ credibility and expressed frustration and anger at the perceived misinformation: “It’s all different kind of lung diseases out there and it don’t come from tobacco. So I don’t know where they getting this crap from, but I think they need to redo their research all over again.” In addition to denial about the effects from smoking, she represented an emerging theme for a subset of participants who expressed attitudes regarding the inevitability of and lack of control over acquiring diseases: “You going to die one day from something. Who’s to say it’s going to be nicotine.” Several participants described what they said was a common attitude among smokers: They are going to die anyway so they may as well smoke. They described the inevitability of disease even if they quit because of other exposures, such as environmental toxins and secondhand smoke. These examples show how prior beliefs and attitudes can affect reactions to the labels and, potentially, limit the cognitive and affective impact.

## **Discussion**

This study explored reactions to and perceptions of graphic warning labels among adult low-income smokers in Baltimore, Maryland. Using health communication and behavioral theories (Bandura, 2012; Witte & Allen, 2000), the study developed several types of efficacy and threat messages and explored the perceived influence of the labels on risk perceptions (i.e., perceived severity and susceptibility) and self-efficacy beliefs. In addition, the study compared perceptions of labels with a threat message, efficacy message, and threat + efficacy message.

We found that, when asked which labels influenced their self-efficacy beliefs, smokers selected most often labels with efficacy messages and no threat, followed by high then low threat. Reasons included enhanced feelings of confidence from self-efficacy messages, vivid pictures, and desires to avoid the disease and be healthy. This finding illustrates the complex interplay between risk perceptions and efficacy beliefs in the influence of graphic warning labels. Research has shown that higher threat messages are more persuasive and accepted than lower threat messages only among individuals with high self-efficacy (Block & Punam, 1997; Popova, 2014). Romer et al. (2013) found that graphic warning labels increased intentions to quit only among smokers with stronger quitting self-efficacy beliefs. The gaps in the literature demonstrate a need to further understand the role that graphic warning labels can play in efficacy beliefs and to test combinations of threat and efficacy messages to determine their possible impact on cessation-related attitudes and behaviors.

Public health practitioners have recommended the development of graphic warning labels with efficacy messages (Cismaru & Lavack, 2007; Strahan et al., 2002), but limited progress has been made. Although other studies have found limited impact of labels on efficacy beliefs (Berg et al., 2011; Hammond, 2011; Romer et al., 2013; Schneider et al., 2012), these findings may be due to the lack of development of theory-driven self-efficacy messages. To fill this gap, we developed three types of self-efficacy messages (i.e., social persuasion, mastery experience, and vicarious experience) and explored reactions to these messages and their perceived influence on efficacy beliefs. We found that participants reacted positively to efficacy messages and reported the messages influenced their self-efficacy beliefs. Their efficacy beliefs seemed to be most influenced by vicariously experiencing the quit successes of the characters pictured on the labels. Observing others perform actions and the consequences of those actions is an important way that individuals learn, and observing the behaviors of role models in the media environment can not only teach new skills but also enhance self-efficacy to perform those behaviors (Bandura, 2001). For example, the use of role models has been shown to increase self-efficacy and intentions to perform breast self-examinations (Anderson & McMillion, 1995), rehabilitation self-efficacy and outcomes following knee surgery (Maddison, Prapavessis, & Clatworthy, 2006), and smoking cessation during pregnancy (Secker-Walker et al., 1997).

Narrative communication, which describes events and characters to promote a particular message, is an effective means to engage the audience in vicariously experiencing the characters' behaviors and outcomes, thus overcoming message



resistance and promoting message acceptance (Kreuter et al., 2007). However, studies on the use of testimonials on graphic warning labels, which are narratives of real smokers' experiences with smoking-related conditions, have shown mixed results regarding their perceived effectiveness (Hammond, 2011; Hammond et al., 2013; Hammond et al., 2012; Thrasher, Carpenter, et al., 2012). Testimonial labels may be most effective among smokers with greater quitting self-efficacy (Berg et al., 2011) and low educational attainment (Thrasher et al., 2010). Overall, research on testimonial labels is limited because it only examined individuals suffering from the health consequences of smoking, rather than their quit successes. Our study shows that smokers may also vicariously experience characters' quit success, which may be an important pathway for labels to enhance quitting self-efficacy. However, an important finding was that the characters might not have been adequate role models for all participants. Research is needed to develop and test graphic warning labels with appropriate and realistic role models for cessation success using a narrative format.

In addition, this study explains a pathway through which labels may influence cessation—by enhancing perceived severity of and susceptibility to smoking-related conditions. When asked which labels affected their risk perceptions the most, participants selected high threat labels, followed by low threat labels, more often than no threat labels because of the vivid picture, negative affective reactions, and information provided. These findings are consistent with other evidence that suggests vivid depictions of the physical effects from smoking are most effective in changing smoking-related attitudes and behaviors (Berg et al., 2011; Hammond, 2011; Hammond et al., 2012; Kees et al.,

2010; Thrasher, Carpenter et al., 2012; Thrasher et al., 2012). However, this study also found that low threat labels frequently evoked affective and cognitive responses, and the use of these labels may be important for smokers who would be unmotivated by (or avoid) high threat labels. Individuals who perceive a high level of risk but lack self-efficacy may view their susceptibility to diseases as inevitable and take no preventive action (Maibach & Murphy, 1995; Rimal & Real, 2003). Indeed, we found evidence of fatalistic attitudes among some participants, which may have influenced their reactions to the labels. They may avoid labels portraying a high threat if they lack quitting self-efficacy. Moreover, research has shown that, when confronted with distressing pictures, individuals pay less attention to the persuasive text accompanying the picture (Brown & Richardson, 2012). To reach a wide range of smokers, labels portraying a range of threat levels may be useful, particularly if text accompanies pictures.

While this study highlights important findings that can assist the development of theory-based, effective graphic warning labels, transferability of the findings is limited due to its qualitative and exploratory approach. The source population of low-income smokers in Baltimore City, as well as the purposive sampling, helped ensure adequate distributions by age group and gender, but may have limited the transferability to other populations.





Despite these limitations, the use of well-established theories in this study to develop and explore warning labels may contribute to the theoretical generalizability of the findings and to methods for developing future labels. The theory used in this study (EPPM) provided a useful lens to investigate the influence of labels on individuals' risk


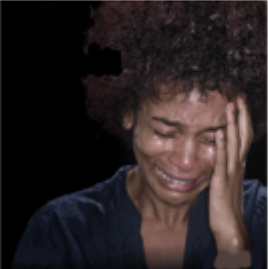


perceptions and self-efficacy beliefs. However, it may be useful for future work among low SES populations to expand to other individual and environmental characteristics that might affect the influence of labels in this population, such as social norms and perceptions of risk from smoking relative to other risks in their environment like drug use, violence, and food insecurity.





Erosion of graphic warning label effectiveness over time means that new labels need to be developed and implemented periodically (Hammond, 2011). This study suggests new ways to design labels with efficacy and threat messages to enhance the acceptance and impact of labels. In particular, narratives that allow smokers to vicariously experience characters' quit successes may be effective. Moreover, the findings may aid in the development graphic warning labels to address smoking disparities among low SES populations.

Tables

**Table 3.1. Characteristics of the threat level and efficacy messages on graphic warning labels**

Label #	Label Image	Threat Level	Type of Efficacy Message
1	<p data-bbox="427 422 894 447"><b>WARNING: Cigarettes cause lung disease</b></p>  <p data-bbox="699 499 894 632">Lena was diagnosed with emphysema at 42. After her diagnosis, she quit smoking by staying busy when she felt an urge to smoke.</p> <p data-bbox="699 674 894 699">Call 1-800-QUIT-NOW</p>	Low	Self-efficacy: Vicarious experience
2	<p data-bbox="427 743 919 768"><b>WARNING: Cigarettes cause gangrene</b></p>  <p data-bbox="716 848 894 915">Ask your friends and family for support to help you quit.</p> <p data-bbox="716 957 919 982">Call 1-800-QUIT-NOW</p>	High	Self-efficacy: Mastery experience
3	<p data-bbox="427 1062 919 1087"><b>WARNING: Cigarettes cause heart disease</b></p>  <p data-bbox="716 1199 919 1224">Call 1-800-QUIT-NOW</p>	Low	None
4	<p data-bbox="427 1331 919 1356"><b>WARNING: Cigarettes cause cancer</b></p>  <p data-bbox="716 1388 919 1476">You are more likely to quit when you talk to an expert. To talk to an expert for free,</p> <p data-bbox="716 1497 919 1522">Call 1-800-QUIT-NOW</p>	High	Response efficacy: Quitline

5	<b>WARNING: Smoking during pregnancy can harm your baby</b>	High	None
			
	Call 1-800-QUIT-NOW		
6	<b>WARNING: Tobacco smoke causes fatal lung disease in nonsmokers</b>	Low	Self-efficacy: Mastery experience
			
	Delay smoking your first cigarette to help you quit.		
	Call 1-800-QUIT-NOW		
7	<b>WARNING: Tobacco smoke can harm your children</b>	Low	Response efficacy: Quitting
			
	Quit smoking now to lower your children's risk of getting lung disease.		
	Call 1-800-QUIT-NOW		
8	<b>WARNING: Smoking causes sadness, pain and death</b>	High	Self-efficacy: Social persuasion
			
	Don't let cravings stop you from quitting. You can quit.		
	Call 1-800-QUIT-NOW		

9	<p><b>WARNING: Quitting will improve your health</b></p>  <p>Your heart attack and cancer risk drop as soon as you quit. Call 1-800-QUIT-NOW</p>	None	Response efficacy: Quitting
10	<p><b>WARNING: Quitting smoking now greatly reduces serious risks to your health</b></p>  <p>Michael quit smoking at 40 by setting his quit date and getting rid of all his cigarettes. Call 1-800-QUIT-NOW</p>	None	Self-efficacy: Vicarious experience
11	<p><b>WARNING: Quit to improve your children's health</b></p>  <p>You're not just quitting for yourself. You have the power to quit. Call 1-800-QUIT-NOW</p>	None	Self-efficacy: Social persuasion
12	<p><b>WARNING: Quit to live longer for your loved ones</b></p>  <p>Join the thousands who quit using the Quitline. Call 1-800-QUIT-NOW</p>	None	Response efficacy: Quitline

**Table 3.2. Characteristics of sample of 25 low-income smokers in Baltimore, Maryland**

<b>Characteristics</b>	<b>n (%)<sup>1</sup></b>
Age in years (mean ± standard deviation)	45 ± 11
Age range in years	22 – 61
Age group	
< 40 years	10 (40)
≥ 40 years	15 (60)
Race	
African American	22 (88)
Caucasian	3 (12)
Gender	
Male	12 (48)
Female	13 (52)
Marital status	
Single	12 (48)
Married/partnered	12 (48)
Separated	4.0 (1)
Level of education	
Less than high school	12 (48)
High school or GED <sup>2</sup> completed	11 (44)
Some college, college completed or higher	2 (8)
Employment status	
Employed full time	1 (4)
Unemployed	7 (28)
Unable to work or retired	16 (64)
Student	1 (4)
Personal pre-tax income from previous year	
Less than \$10,000	16 (64)
\$10,000 – 29,999	6 (24)
\$30,000 – 49,999	1 (4)
Not applicable	2 (8)
Smoking frequency	
Once a week or a few times a week	2 (8)
Everyday	23 (92)
Cigarette packs smoked per day <sup>3</sup>	
Less than 1 pack	11 (44)
1 pack	7 (28)

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More than 1 pack	7 (28)
Ever tried to quit	14 (56)
$\geq 1$ quit attempt in the previous 12 months <sup>4</sup>	11 (79)
Currently trying to quit <sup>4</sup>	8 (57)

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<sup>1</sup> Frequency and percentage reported unless otherwise noted.

<sup>2</sup> General Educational Development (GED).

<sup>3</sup> On days that they smoked.

<sup>4</sup> Only among participants who reported ever trying to quit (n=14).



**CHAPTER 4: MANUSCRIPT 2 – Perceptions of similarity to the characters on  
graphic warning labels**

**Perceptions of Similarity to the Characters on Graphic Warning Labels among  
Low-Income, Urban Smokers\***

*\*As of August 26, 2014, the manuscript is under review at Health Psychology*

**Abstract**

**Background:** The health communication literature suggests that individuals' perceived similarity to a character portrayed in the media increases the message's persuasiveness and influence on attitudes and behaviors. To inform the development of graphic warning labels that promote smoking cessation, this qualitative study explored low-income, urban smokers' perceptions of characters who portrayed the negative effects of smoking (negative characters) and benefits of quitting (positive characters) on graphic warning labels.

**Methods:** In-depth interviews were conducted with 25 adult men (n=12) and women (n=13) smokers in Baltimore, Maryland. Participants were asked about their perceived similarity and dissimilarity to characters on eight labels. Data were coded using an inductive and deductive approach and analyzed using the framework method, a type of thematic analysis.

**Findings:** Participants reported feeling similar to positive characters more often than negative characters. The factors that seemed to most influence perceived similarity were aspiration to be like the characters, feeling similar emotions (such as happy or upset), experiencing similar health conditions or treatments (such as hospitalization or difficulty breathing), attitudes (such as having a positive outlook), and life experiences. Age and

gender concordance between the character and participant played a small role, but participants reported that racial concordance played no role.

**Conclusion:** The findings suggest new approaches for the design of labels, such as characters as role models for cessation and characters progressing from minor to serious illnesses to enhance risk perceptions. Further work is needed to most effectively leverage perceived similarity in the design and evaluation of graphic warning labels.

## **Introduction**

Smoking continues to be the leading preventable cause of morbidity and premature mortality in the U.S. and globally (U.S. Department of Health and Human Services, 2014; World Health Organization, 2011b). It causes numerous cancers, respiratory and cardiovascular diseases, stroke, reproductive effects, and other negative health conditions, and the risk and severity of smoking-attributable disease is strongly correlated with extent of exposure (U.S. Department of Health and Human Services, 2010, 2014). As of 2010, the majority (69%) of U.S. smokers currently wanted to quit smoking; among current smokers and former smokers who quit in the previous year, few (6%) were able to achieve cessation for six months or more (Centers for Disease Control and Prevention, 2011). Significant disparities in smoking cessation exist in the U.S.: The majority of low socioeconomic status (SES) smokers—i.e., those living below the poverty line or with the educational attainment of a high school diploma/GED or less—are interested in quitting, but they are less likely to quit successfully than those with higher SES (Barbeau et al., 2004; Centers for Disease Control and Prevention, 2011; Gilman et al., 2003).

Graphic warning labels are pictorial labels warning about the dangers of smoking displayed prominently on cigarette packaging and a promising means to promote population-wide cessation as part of a comprehensive tobacco control policy (World Health Organization, 2003). Forty-nine countries have implemented graphic warning labels as of 2012 (Hiilamo et al., 2014). The U.S. Food and Drug Administration published a rule in 2011 requiring cigarette packaging to display nine approved graphic warning labels, but it has not yet been implemented (U.S. Food and Drug Administration, 2012).

Numerous observational and experimental scientific studies have shown that graphic warning labels are more effective than text-only labels at promoting smoking cessation behaviors, including increased calls to the national Quitline and quit attempts (Azagba & Sharaf, 2013; Hammond, 2011; Miller et al., 2009). The persuasiveness of graphic warning labels lies in their ability to provoke emotional and cognitive reactions. Emotional (e.g., fear, worry, disgust) and cognitive (e.g., message believability, perceived impact on self and others) responses to the labels are associated with increases in key cessation-related outcomes such as knowledge of the health effects of smoking, intentions to quit, quit attempts, and quitting (Borland, Yong, et al., 2009; Hammond, 2011; Hammond et al., 2004; Hammond et al., 2003). To elicit these reactions, graphic warning labels have relied heavily on the use of fear appeals to depict (sometimes vividly) the consequences of smoking, which research has shown to be an effective approach to promoting cessation (Emery et al., 2014; Hammond, 2011; Hammond et al., 2004; Kees et al., 2010). Evidence suggests that graphic warning labels have a greater

impact than text-only labels across all SES groups (Cantrell et al., 2013; Hammond et al., 2012; Thrasher, Carpenter, et al., 2012).

A critically important aspect of graphic warning labels often overlooked in the literature is how people perceive the characters in the pictures, particularly their perceived similarity to the characters. Perceived similarity is “the degree to which an individual perceives that he or she is similar to a character” (Moyer-Gusé, 2008, p. 410). Research suggests that perceived similarity to the character portrayed in a health message can increase the message’s persuasiveness, information retention, and favorable attitudes toward the message (Andsager et al., 2006; Appiah, 2001; Hoffner & Buchanan, 2005; Moyer-Gusé, 2008). Similarity may be particularly important in the face of a high threat message, because it can help overcome avoidance and reduce resistance (Moyer-Gusé, 2008; Silvia, 2005).

In addition to influencing individuals’ responses to messages and changes in attitudes, greater perceived similarity may also lead to modeling of the character’s behavior (Andsager et al., 2006; Hoffner & Buchanan, 2005). According to social cognitive theory, exposure to models of various behaviors, including those in the media, can shape attitudes towards the behavior, affect perceptions about the acceptability and prevalence of the behavior (i.e., norms), and teach new behaviors (Bandura, 2001). Individuals are more likely to imitate behavior learned from models if they observe the models receiving positive rewards, not punishments, for the behavior, particularly if they perceive themselves as similar to the model (Bandura, 2001). For example, models in the media that portray positive aspects of smoking (e.g., glamor, stress relief) promote

attitudes favorable to smoking (Charlesworth & Glantz, 2005; Hines et al., 2000; Watson et al., 2003). Similarly, tobacco cessation may be effectively promoted in the media through models that portray the negative aspects of smoking (Chapman & Davis, 1997). Research has shown that similarity to characters can enhance feelings of confidence (i.e., self-efficacy) to perform behaviors modeled by the characters (de Graaf, 2014), desire to become like the characters (Hoffner & Buchanan, 2005), and engagement in the modeled behaviors (Fox & Bailenson, 2009). Thus, graphic warning labels portraying a character suffering from the health consequences of smoking may serve as a more effective negative model to encourage cessation when the character is similar to the smoker viewing the message. Similarly, the portrayal of a similar character who is able to quit smoking successfully may serve as a better positive model for smokers to emulate to achieve cessation than labels portraying a dissimilar character.

Because perceived similarity has received little attention in the graphic warning label literature, there is limited understanding of which traits provoke perceived similarity in smokers. At this point, it is necessary to distinguish between an emic perspective on similarity—that is, the individual’s estimation of his or her similarity to a character—and an etic perspective—that is, an outsider’s appraisal of the individual’s similarity to a character, such as demographic concordance between the individual and character. The emic and etic perspective may or may not be equivalent. The health communication literature has shown that an emic appraisal of perceived similarity encompasses multiple dimensions, such as personality, beliefs, values, attitudes, behavioral tendencies and life experiences (Cohen, 2001; Hoffner & Buchanan, 2005; Moyer-Gusé, 2008). For

example, Hoffner and Buchanan (2005) found that respondents felt similar to television characters who seemed similar in attitudes and had certain personality attributes (e.g., intelligent, successful). Demographic traits such as race, ethnicity, age, and gender may also be significant cues of similarity in media, based on an emic or etic appraisal of similarity (Appiah, 2001; Hines et al., 2000; Hoffner & Buchanan, 2005). Elucidating an emic appraisal of which character traits portrayed on graphic warning labels evoke perceptions of similarity in smokers could be highly useful in the design of new labels.

The aim of this qualitative research study was to explore low-income, urban smokers' perceptions of their similarity (and dissimilarity) to the characters on graphic warning labels. Labels were developed with characters portraying the negative effects of smoking (i.e., negative characters) and positive effects of quitting (i.e., positive characters) and displaying a range of demographic characteristics. This enabled us to examine which character traits evoked perceived similarity and whether the traits differed by negative versus positive characters or by participants' demographic traits.

## **Methods**

### *Participants*

Study participants were recruited 1-3 months after participating in the parent quantitative study on tobacco use, attitudes, and communication channels among low-income smokers in Baltimore, Maryland. Recruitment for the parent study took place in low-income neighborhoods through street outreach and word-of-mouth by trained staff from the Lighthouse Studies at Peer Point, a community-based research center that works with low SES populations with a high burden of injection drug use and HIV. This

population was chosen because of its high smoking prevalence and significant barriers to cessation (e.g., difficulty avoiding smoke-filled places). Participants for this qualitative study were chosen from the pool of survey participants using purposive sampling to ensure an adequate distribution by gender and age group (18-39 and  $\geq 40$  years). Participants were stratified by age as younger and older smokers may have different health concerns. Inclusion criteria were (a) aged  $\geq 18$  years, (b) smoked  $\geq 100$  cigarettes in lifetime, and (c) smoked cigarettes in the past 30 days at the time of the parent study.

### *Procedures*

The Johns Hopkins Bloomberg School of Public Health Institutional Review Board approved this study. Participants were recruited over the phone, and semi-structured in-depth interviews took place in a private office at the Lighthouse. Participants provided written informed consent and were compensated with \$25. Interviews were audio-recorded and lasted 1-2 hours. The lead author (E.M.) conducted all recruitment and interview procedures.

### *Data collection*

Participants were shown eight graphic warning labels (Table 4.1) that pictured adult characters' faces and asked about their reactions to the characters portrayed on the labels (see Appendix B for interview guide). Participants were also asked to select which labels showed one or more characters whom they perceived were similar to them. The



interviewer probed for further information about why participants felt similar or dissimilar to the characters.

Using the warning statements mandated by U.S. law whenever possible, labels were either adapted (with permission) from existing labels (from Canada, the U.S., and Brazil) or created. Labels were standardized to include a warning statement at the top, a picture on the left, and subtext on the right with the U.S. Quitline number and describing either the negative effects of smoking or an efficacy message about quitting or the Quitline. Pictures were selected purposively to portray a wide range of characters who differed based on gender, age group (<40 years versus  $\geq 40$  years), and race (African American versus other, which was chosen due to the predominantly African American population in the parent study). Pictures were also selected to portray both characters suffering from the health effects of smoking (negative characters) and characters showing the benefits of quitting (positive characters). The labels and interview guide were pilot tested with five participants for finalization.

Data on age, gender, and race were collected at the time of the interview. Marital status, educational level, employment status, income, smoking frequency, and quitting behavior data were collected during the parent study.

### *Data analysis*

The interviewer (E.M.) developed an initial coding scheme through a deductive approach based on the interview guide and with input from a co-author (J.C.). After initial coding of three interviews, the coding scheme was finalized using an inductive

coding approach based on the data and review by two co-authors (J.C. and C.K.). The interviewer (E.M.) coded all interviews with the final coding scheme and used analytic memoing to reflect on emerging themes or issues, including deviant cases (see Appendix C.1 for final codebook and Appendix C.2 for sample coding). Using the framework analytic method (Gale et al., 2013), data were charted into the framework matrix to provide accurate summaries by case, code, and label, i.e., responses about perceived similarity and dissimilarity were summarized for each participant and label. Responses were also compared by cases' demographic characteristics (i.e., gender, age group, and race/ethnicity) to identify patterns. Notes taken during the interviews as well as post-interview summaries were also considered to provide context. Broader themes were developed by comparing codes within and across cases with special attention to deviant cases. To enhance rigor and transparency (Gale et al., 2013), the data were summarized by case within the matrix, thus keeping the data within the rich context of each case. The matrix structure allowed for the identification of patterns and included references to specific transcript lines to easily ascertain the evidence supporting the themes.

## **Findings**

### *Study sample*

Demographic characteristics of the study sample have been reported elsewhere (see Table 3.2). In brief, the 25 participants were on average 45 years old (SD=11 years), 22 were African American, and 13 were female. Nearly all either achieved less than a high school education (n=12) or completed high school or the GED equivalent (n=11), and 16 had an income less than \$10,000 during the previous year. Most were retired or

unable to work for health reasons (n=16), and either single (n=12) or married/partnered (n=12). In terms of smoking behaviors, 23 participants reported smoking every day in the previous 30 days, and 11 reported smoking less than one pack per day. In terms of quitting behaviors, 14 participants had ever tried to quit, and among these 14 participants, 11 had made at least one quit attempt in the previous 12 months and eight were currently trying to quit.

#### *Perceived similarity to the characters on the labels*

When asked which labels portrayed characters to whom they felt similar, 20 participants responded that they felt similar to a character on at least one label. Table 4.2 presents a summary of factors related to perceived similarity and dissimilarity to the characters on the labels. Participants felt similar to the positive characters (who quit without suffering the negative effects from smoking) more often than the negative characters (who are suffering from the negative effects of smoking). For the positive characters, the most cited reason for similarity was aspirational in nature: Participants wanted to quit and experience the benefits of quitting like the characters, including wanting to feel proud, happy, and healthy. For example, when asked why she felt similar to a positive character, one older woman responded: “This is giving me a message – that quitting smoking will improve my health...I want to look healthy.” In this way, positive characters served as role models for quitting and being healthy to participants. For several participants, these aspirational feelings of similarity to the characters corresponded with giving them confidence in their ability to quit (i.e., self-efficacy): “I know I can quit if I

want to, but it's like, yeah, looking at him I'm like 'If he can do it, I know I could do it'" (younger woman).

Participants also reported that the positive characters portrayed attitudes that were similar to their attitudes, such as thinking positively and wanting to improve their lives, as well as portrayed similar emotions, such as feeling happy once they achieve cessation: "They're like me. I'm going to be feeling like them [when I quit]... [A] positive way of thinking can get you a long way, than a negative way... If you be around more positive people, positive things happen" (older man). As illustrated in this quote, the participant felt similar to a character emotionally (anticipated happiness after quitting) and attitudinally (thinking positively). A few participants also reported that they felt similar to positive characters who seemed to be a similar age.

Reasons for reporting perceived similarity to negative characters (who were suffering from the negative effects of smoking) were highly varied. The most frequently cited reasons were emotional and health similarity. Several participants reported that they experienced emotions similar to those portrayed by the negative characters (e.g., stress, sadness): "Well, I picked [label] #6 because she's upset. Don't have nothing to do with the message, but she's upset, and when I get upset I smoke cigarettes, so that's why I picked that one" (younger woman). Participants also reported that they had experienced, or knew someone who had experienced, health conditions similar to those portrayed by the negative characters. Furthermore, participants felt similar to characters whose health conditions they anticipated facing in the future; sometimes the condition was viewed as inevitable, and other times as something to worry about and avoid:

Well, he's going through some conditions that I'm going through right now. I'm just not in the hospital at this particular time... So, if I don't stop finally, I will be in maybe his next phase of being seen by the hospital. (older man)

Because that's the picture I've got on everybody I've ever known that smoke cigarettes. Sooner or later, we wind up on oxygen. (older man)

Several other participants reported having similar life experiences as the negative characters, such as having to overcome hurdles in life and to quit using drugs in order to survive (like the character had to quit smoking to survive). Other, less cited reasons for perceived similarity to negative characters included having a similar attitude (such as a desire to quit), behavioral tendencies (such as smoking around nonsmokers), and personality traits (such as stubbornness), as well as being the same age and gender. No participants reported feeling similar to a character because of race/ethnicity.

Responses were quite similar across age, gender, and racial groups, although an interesting finding emerged regarding how several younger and older participants discussed similarity in age. For a few younger participants, especially two men, age concordance was a significant factor by which they perceived similarity to a character. Although some older participants discussed their resemblance to characters' ages, it did not figure prominently in discussions of their perceived similarity to characters.

#### *Perceived dissimilarity to the characters on the labels*

Participants also explained why they felt dissimilar to the characters portrayed on the labels, including the five participants who reported that they did not perceive themselves as similar to any character (Table 4.2). The most important reason was that

they did not have the smoking-related health conditions portrayed by the negative characters, which made it difficult for them to relate to the characters. However, several participants added that they were concerned about the condition and wanted to avoid getting it: “All of them suffer from diseases. But I ain't trying to get these diseases. That's what I'm saying. <laughs> I'm not trying to get them” (older man). As illustrated in this quote, characters viewed as dissimilar could still influence smoking-related risk perceptions.

In addition, many participants reported feeling dissimilar to positive characters who were portrayed as having happy, healthy, and supportive familial and romantic partner relationships. They stated that they could not relate to these characters because they did not have children or close relationships with family or partners. Some reported that their families were unhealthy or unhappy, in contrast to the positive characters. Several participants also stated that they were dissimilar to positive characters because the characters had quit and they had not. For both positive and negative characters, three younger and one older participant cited age differences as a reason for dissimilarity.

#### *Perceived credibility of the characters*

Overall, most participants reported that the characters were believable. Factors that seemed to enhance the believability of the characters included the authenticity of the emotions they portrayed (such as happiness after quitting), their healthiness after quitting, their appearance as real people (not actors), and their experiences coinciding with participants' experiences and expectations. For example, participants commented that

they expect to feel the same level of joy and pride—and their families to experience the same level of happiness—as the characters after they quit. However, participants also reported that some of the characters were not believable because they appeared to be actors and not real people, because their emotions did not appear to be genuine (such as not portraying happiness after cessation), or because participants did not have enough information about the characters (such as how they quit or how smoking caused the disease). Participants also reported that some characters did not match the text, which led to confusion about the message. Lack of believability seemed to diminish participants' understanding of the message:

Well, like I said, this could just be a front for this picture... Who's to say these people are really happy?... They probably got paid to take this picture. You understand what I'm saying? Right after they took the picture, who's to say ain't nobody light a cigarette up?... So I don't pay this crap right here no mind. (younger woman)

As illustrated in the above quote, the believability of the characters may have influenced message salience and acceptance.

## **Discussion**

This study presents new findings about low-income, urban smokers' responses to the characters on graphic warning labels and factors that affect their perceptions of similarity to these characters. Specifically, participants reported feeling most similar to characters who modeled desirable behaviors and characteristics or portrayed emotions, health conditions, attitudes, and life experiences they regarded as similar to themselves. These findings are consistent with the literature about perceived similarity and identification with characters in other forms of media (Andsager et al., 2006; Cohen,

2001; Hoffner & Buchanan, 2005; Moyer-Gusé, 2008). Notably, there was overlap between reasons for perceived similarity and dissimilarity, such as health status and emotions. The design of graphic warning labels should recognize and address these factors as they may enhance (or diminish) label effectiveness through similarity. For example, label research often assesses the impact of labels on negative emotional reactions (e.g., Hammond, 2011), but the audience's assessment of characters' emotions—and their judgments of similarity or dissimilarity based on those displayed emotions—may also influence message acceptance and impact and should be tested during label development.

This study compared responses to positive characters and negative characters on labels to explore differences in factors that evoked perceptions of similarity and dissimilarity. Participants reported feeling similar to positive characters who modeled quitting and the benefits of quitting more often than the negative characters who portrayed the unhealthy effects of smoking. Graphic warning labels often use characters depicting the negative health consequences of smoking to arouse fear and other negative emotions (Hammond, 2011), but this finding illustrates positive characters may be useful as models for quitting. Characters portrayed in the media can shape individuals' attitudes, confidence to perform behaviors (self-efficacy), and behaviors by modeling actions and the positive or negative consequences of those actions (Bandura, 2001). Therefore, labels depicting the success of real people in their efforts to quit smoking and the benefits they and their families experience from quitting may be a promising approach for graphic warning label design.



Although some overlap existed between factors that shaped similarity to positive and negative characters, several important differences emerged. Aspiration was the most significant reason for perceived similarity to positive characters. Many participants felt similar to positive characters because they wanted to quit and experience the benefits of quitting like the characters. This psychological process of wanting or attempting to become like another individual has been called wishful identification (Hoffner & Buchanan, 2005). Other studies have shown that wishful identification with media characters is associated with drinking behavior in adolescents (Austin, Pinkleton, & Fujioka, 2000), aggression in adolescent boys (Konijn, Nije Bijvank, & Bushman, 2007), and eating disorders in young adult women (Harrison, 1997). In addition, adolescents whose favorite movie stars smoke on-screen are more likely to smoke or be susceptible to smoking (Distefan, Pierce, & Gilpin, 2004; Tickle, 2001), and this finding may be partially attributable to a desire to emulate these role models. Wishful identification with positive characters on graphic warning labels may promote positive changes in cessation-related attitudes and behaviors in smokers, although further work is needed to examine this possibility with adults through experimental studies with longitudinal follow-up.

Health status played an important role in perceptions of similarity, as well as dissimilarity, to negative characters. Participants were able to identify with characters experiencing a health condition similar to one that they themselves experienced or someone they knew had experienced. For several participants the characters' portrayal of smoking-related conditions made them contemplate their future health and the need to prevent these conditions, even for participants who viewed themselves as dissimilar to

characters due to differences in current health status. The prominence that health status played in reactions to negative characters illustrates a potential opportunity to influence smokers' risk perceptions. Perceived similarity can enhance the effect of messages on feelings of susceptibility to health conditions by showing highly similar characters as vulnerable to the harmful effects of an unhealthy behavior (de Graaf, 2014; Moyer-Gusé, 2008; Rimal & Morrison, 2006). This may be critically important for tobacco control messaging given that many smokers have an unrealistic optimistic bias regarding their risk of lung cancer and cancer in general (Weinstein, Marcus, & Moser, 2005). For example, graphic warning labels could be designed to have a narrative about a character's progression from relatively mild symptoms commonly experienced by smokers (such as persistent coughing) on the front of the cigarette pack to serious, life-threatening conditions (such as emphysema) on the back. Alternatively, the label could show a character with a life-threatening condition and a written testimonial describing his or her progress from a mild symptom. Through this narrative process, smokers may perceive themselves as similar to (and be able to identify with) characters displaying symptoms they currently have and increase their perceived susceptibility to the life-threatening outcomes.

Age and gender concordance played a small role in participants' perceptions of their similarity and dissimilarity to characters, and race played no discernable role. Support of these findings in the literature is mixed. Other studies have found that perceived similarity is associated with gender concordance between the character and audience (Eyal & Rubin, 2003; Hines et al., 2000; Hoffner & Buchanan, 2005). Findings

about age and racial concordance have varied (Appiah, 2001; Hoffner & Buchanan, 2005). Aspiration to be like characters, attraction to characters, and similarity in other characteristics, such as attitudes, may be more important factors in shaping perceived similarity than demographic concordance (Cohen, 2001, 2006). However, the finding that age concordance may be important for younger (<40 years) smokers warrants further study. For the design of graphic warning labels, it may be important to vary the ages of characters portrayed on labels, especially to include young adults, to enhance perceived similarity across the age spectrum of smokers. This study only explored participants' reasons for their similarity to characters (an emic perspective); future work could experimentally or cross-sectionally test similarity based on demographic concordance (an etic perspective).

Although many participants stated the characters were believable, some suspected their credibility. Reasons included authenticity as real individuals and not actors, authenticity of their emotions, and the need for more information about the characters and their experiences. Credibility of the characters portrayed on graphic warning labels can have significant implications for label effectiveness. Research has shown that highly credible sources tend to be more persuasive than low-credibility sources, and perceived similarity can enhance the impact of source credibility (Pornpitakpan, 2004). Research is needed to determine what characters (i.e., sources) are credible for the delivery of messages on labels and to design labels with credible characters. A range of characters may be needed to target different segments of the smoker population, such as younger adult characters who quit or have negative aesthetic effects from smoking for younger

smokers or characters emphasizing the severe risks of smoking for smokers who perceive low risks.

While this study is one of the first to explore perceptions of similarity and dissimilarity to characters on graphic warning labels, it has some limitations. Although the qualitative methodology allowed for an in-depth exploration of perceptions of the characters and insight into a range of emic perspectives on perceived similarity, it limits findings about the etic perspective on similarity. Furthermore, the cross-sectional study design did not allow for an examination of the changes in attitudes and behaviors in the study sample after exposure to the labels; thus, conclusions cannot be made about the impact of similar versus dissimilar characters on cessation-related outcomes. Similarly, we did not collect information on other participant characteristics, such as self-esteem (Gibbons & McCoy, 1991), limiting our ability to consider how these may have shaped responses to the characters.

The study also had several strengths. This is the first study to look at perceptions of the characters on graphic warning labels and how perceptions might differ by negative and positive characters. The qualitative design permitted an in-depth exploration of perceptions and the factors that shape them. Although the community-based, predominantly African-American sample may have limited the exploration of racial concordance as a factor for perceived similarity, the focus on an understudied population (i.e., low SES, minority smokers) fills a gap in the similarity and identification literature, which often uses university-based, Caucasian participants. In addition, the purposive





sampling technique helped ensure adequate distributions by age group and gender to explore differences by demographic factors.

This study identified a number of factors shaping perceived similarity to characters on graphic warning labels and suggested new avenues for label design and evaluation. Further research is needed to determine if perceived similarity and dissimilarity to characters can impact cessation-related outcomes in smokers. Moreover, this study illustrated the need to measure perceived similarity to characters when evaluating the effectiveness of graphic warning labels.

Tables

**Table 4.1. Characteristics of the characters portrayed on graphic warning labels**

<b>Label #</b>	<b>Label Image</b>	<b>Age Group</b>	<b>Gender</b>	<b>Race/ Ethnicity</b>
1	<p><b>WARNING: Cigarettes cause lung disease</b></p>  <p>Lena was diagnosed with emphysema at 42. After her diagnosis, she quit smoking by staying busy when she felt an urge to smoke.</p> <p>Call 1-800-QUIT-NOW</p>	≥40 years	Female	Caucasian
2	<p><b>WARNING: Cigarettes cause cancer</b></p>  <p>You are more likely to quit when you talk to an expert. To talk to an expert for free,</p> <p>Call 1-800-QUIT-NOW</p>	≥40 years	Male	African American
3	<p><b>WARNING: Tobacco smoke causes fatal lung disease in nonsmokers</b></p>  <p>Delay smoking your first cigarette to help you quit.</p> <p>Call 1-800-QUIT-NOW</p>	<40 years	Female	African American
4	<p><b>WARNING: Smoking causes sadness, pain and death</b></p>  <p>Don't let cravings stop you from quitting. You can quit.</p> <p>Call 1-800-QUIT-NOW</p>	≥40 years	Male & Female	Hispanic

5	<b>WARNING: Quitting will improve your health</b>	<40 years	Male	African American
				
	<p>Your heart attack and cancer risk drop as soon as you quit.</p> <p>Call 1-800-QUIT-NOW</p>			
6	<b>WARNING: Quitting smoking now greatly reduces serious risks to your health</b>	≥40 years	Male	Caucasian
				
	<p>Michael quit smoking at 40 by setting his quit date and getting rid of all his cigarettes.</p> <p>Call 1-800-QUIT-NOW</p>			
7	<b>WARNING: Quit to improve your children's health</b>	≥40 years	Male & Female	African American
				
	<p>You're not just quitting for yourself. You have the power to quit.</p> <p>Call 1-800-QUIT-NOW</p>			
8	<b>WARNING: Quit to live longer for your loved ones</b>	≥40 years	Male & Female	African American
				
	<p>Join the thousands who quit using the Quitline.</p> <p>Call 1-800-QUIT-NOW</p>			

**Table 4.2. Summary of factors related to perceived similarity and dissimilarity to the characters portrayed on graphic warning labels.**

	<b>Perceived Similarity</b>	<b>Perceived Dissimilarity</b>
<b>Labels with Positive Characters<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• Aspiration to quit and experience benefits of quitting</li> <li>• Emotions</li> <li>• Attitudes</li> <li>• Demographic traits: age, gender</li> <li>• Background</li> <li>• Personality traits</li> <li>• Social relationships</li> </ul>	<ul style="list-style-type: none"> <li>• Social relationships: absence of children, poor relationships with family or romantic partner, unhealthy and unhappy family</li> <li>• Quit status</li> <li>• Demographic traits: age</li> <li>• Emotions</li> <li>• Behavioral tendencies: does not engage in healthy behaviors</li> <li>• Attitudes</li> <li>• Health status: not healthy</li> <li>• Personality traits</li> </ul>
<b>Labels with Negative Characters<sup>3</sup></b>	<ul style="list-style-type: none"> <li>• Emotions</li> <li>• Health: has similar health condition currently or had previously, knows someone with similar health condition</li> <li>• Future health: anticipates experiencing similar health conditions in the future</li> <li>• Life experiences</li> <li>• Attitudes</li> <li>• Behavioral tendencies: has engaged in the same behaviors or would in the future</li> <li>• Personality traits</li> <li>• Demographic traits: age, gender</li> </ul>	<ul style="list-style-type: none"> <li>• Health status: does not have that health condition</li> <li>• Attitudes</li> <li>• Behavioral tendencies: would not engage in that behavior</li> <li>• Emotions</li> <li>• Demographic traits: age</li> <li>• Social relationships: absence of children and spouse</li> </ul>

<sup>1</sup> Number of participants who selected at least one label that showed a character to whom they felt similar.

<sup>2</sup> Defined as characters who quit without suffering negative effects from smoking.

<sup>3</sup> Defined as characters who suffer from the negative effects from smoking.



**CHAPTER 5: MANUSCRIPT 3 – Perceptions of the motivational impact of graphic  
warning labels**

## **“It Really Makes You Think”: Perceptions of the Motivational Impact of Graphic Warning Labels among Low-Income Smokers in the United States**

### **Abstract**

**Background:** Use of communication theories in graphic warning label development might enhance labels’ impact on motivation to quit, but research has been limited, particularly among low socioeconomic status (SES) populations in the U.S. This qualitative study explored perceptions of theory-based labels and their role in motivation among low-income smokers.

**Methods:** Interviews were conducted with 25 adult (aged 22-61 years) smokers in Baltimore, Maryland. We asked participants about 12 theory-based labels falling into four content categories: negative depictions of the health effects of smoking to smokers and others, and positive depictions of the benefits of quitting to smokers and others. Negative depictions also varied by portrayal of high or low (vivid versus nonvivid pictures) threat. Data were coded using a combined inductive/deductive approach and analyzed through framework analysis.

**Findings:** Participants most often said that labels depicting effects to smokers were motivational, followed by labels depicting effects to others, regardless of portrayal of high or low threat. Reasons included perceived severity of and susceptibility to the effects, negative emotional reactions (such as fear), and concern for children. Labels about the benefits of quitting were described as motivational because of their hopefulness, characters as role models for quitting and its benefits, and desire to improve

family health. Reasons why labels were described as not motivational included lack of impact on perceived severity/susceptibility and low credibility.

**Conclusion:** Findings suggest innovative theory-based approaches for labels, such as using former smokers as role models and socially-oriented labels, to motivate cessation among low SES smokers.

## **Introduction**

In the U.S., smoking (including secondhand smoke) causes more than 480,000 premature deaths on average each year, with significant disparities in smoking status by race/ethnicity, educational attainment, and income level (U.S. Department of Health and Human Services, 2014). The smoking burden is highest among populations of low socioeconomic status (SES): About 25% of adults without a high school diploma and 28% of adults living below the poverty line currently smoke cigarettes compared to the national average of 18% (Centers for Disease Control and Prevention, 2014). Moreover, they are less likely to attempt to quit and achieve cessation for  $\geq 6$  months (Centers for Disease Control and Prevention, 2011). Prevalence is highest in low SES neighborhoods, which may be due to targeted advertising and the use of smoking as a coping mechanism for stress and as a shared behavior that fosters norms favorable toward smoking, significant barriers to quitting, and isolation from factors that encourage cessation (Dragano et al., 2007; Hackbarth et al., 1995; Stead et al., 2001). In Baltimore City, Maryland, for example, smoking prevalence is as high as 58% in some low SES neighborhoods (LaVeist et al., 2007).

Research has shown that motivation to quit is associated with making quit attempts (Borland et al., 2010; Clark, Kviz, Crittenden, & Warnecke, 1998). The term motivation conveys both explicit and implicit desire to change a behavior, and includes both an emotional component and a rational, cognitive component that weighs the benefits and risks of changing behavior (Borland et al., 2010). One approach to increase motivation and, subsequently, change behavior is theorized by the extended parallel process model, which posits that individuals are motivated to act through fear if they perceive a high level of risk from their engagement in an unhealthy behavior, specifically that they are susceptible to severe, negative consequences (Witte & Allen, 2000). If they believe that they have the ability to change their behavior (perceived self-efficacy) and the behavioral change will reduce their risk (perceived response efficacy), they are motivated to engage in the healthier behavior, such as smoking cessation. However, if they perceive high risk but low efficacy, they will not be motivated to engage in the healthier behavior and will instead cope with their fear through actions such as avoidance. According to this theory, then, tobacco control messaging that aims to increase smokers' motivation to quit should contain both threat and efficacy messages to increase risk perceptions and efficacy beliefs.

One promising health communication approach to motivate cessation is graphic warning labels. As of 2012, 49 countries have adopted graphic warning labels, but the U.S. is not among them (Hiiilamo et al., 2014). Research has shown that graphic warning labels are more effective than text-only labels at promoting cessation behaviors (such as Quitline calls and quit attempts) because they increase label recall, health knowledge,

attitudes and beliefs favorable to cessation, and intentions to quit (Azagba & Sharaf, 2013; Cantrell et al., 2013; Hammond, 2011; Miller et al., 2011). Labels have largely relied on fear appeals to increase smokers' risk perceptions using depictions of the negative effects of smoking (Hammond, 2011). Studies have looked at the vividness of pictures and the portrayal of internal versus external health effects (Hammond, 2011), but little work has explicitly compared messages about the effects to others to messages about the effects to smokers (Hammond et al., 2012). Labels portraying the effects to other people may be important given that social concern for others is a significant motivating factor for smokers to quit (McCaul et al., 2006). Moreover, limited research on labels' influence on efficacy beliefs has found very little impact, likely due to the lack of theory-driven efficacy messages (Cismaru & Lavack, 2007; Schneider et al., 2012).

To address these gaps in the literature, this qualitative study aims to explore perceptions of graphic warning labels and their influence on motivation to quit among low-income smokers in Baltimore, Maryland. To explore what label content might play a bigger role in motivation, we developed and compared theory-based labels that varied based on: depictions of the effects of smoking or quitting to smokers and to others, level of threat from smoking, and efficacy messages.

## **Methods**

### *Sample and setting*

We conducted semi-structured, in-depth interviews with 25 low-income smokers who had participated in a quantitative study (1-3 months prior) on tobacco use, attitudes and communication channels in Baltimore, Maryland. Inclusion criteria were (a) aged

≥18 years, (b) smoked ≥100 cigarettes in lifetime, and (c) smoked cigarettes in the past 30 days at the time of the quantitative study. Participants were chosen from the quantitative study using purposive sampling for an adequate distribution by gender and age group (18-39 and ≥40 years). We stratified by age to capture variations among younger and older smokers who may have different health concerns.

Recruitment for the quantitative study took place in low-income neighborhoods through street outreach and word-of-mouth by trained staff from the Lighthouse Studies at Peer Point, a community-based research center that works with low SES populations with a high burden of injection drug use and HIV. This population was chosen because of its high smoking prevalence and significant barriers to cessation. At the Lighthouse, unpublished data from three other studies showed smoking rates of 83-88%.

### *Procedures*

Twelve graphic warning labels were developed using (whenever possible) the warning statements mandated by U.S. law and either existing labels (with permission from the U.S., Canada, Brazil, and Australia) or pictures (Table 5.1). Labels were standardized to include the warning statement at the top, picture on the left, and subtext on the right about either the negative effects of smoking or the efficacy of quitting or using the Quitline. The U.S. Quitline number was also included. To ensure a range of content, the labels fell into one of four categories: negative depiction of the health effects of smoking to the smoker (n=4) and to others (a child or adult nonsmoker; n=4), and a positive message about quitting for the smoker (n=2) and others (n=2).

In addition, the labels were designed to portray different levels of threat and convey efficacy messages following the extended parallel process model and social cognitive theory (Bandura, 2012; Witte & Allen, 2000). Based on categorization used previously (Hammond et al., 2012), labels with a highly vivid picture of the negative effects were categorized as high threat, nonvivid picture of the negative effects as low threat, and positive picture about quitting as no threat. The efficacy messages included self-efficacy to quit (confidence in ability to quit successfully), response efficacy of quitting (effectiveness of quitting on improving health), and response efficacy of the Quitline (effectiveness of the Quitline to aid in cessation). The labels and interview guide were pilot tested with five participants and Lighthouse staff (see Appendix A for labels and Appendix B for interview guide).

Participants were shown the labels and asked about their cognitive and affective reactions to each label. They were then asked to select which labels were most likely to motivate them to quit. For participants who initially selected all or most of the labels, the interviewer probed which labels were their top choices. Age, gender, and race data were collected at the time of the interview. Data on marital status, educational level, employment status, income, smoking frequency, and quitting behavior were collected 1-3 months earlier during the quantitative study.

The Johns Hopkins Bloomberg School of Public Health Institutional Review Board approved this study. Interviews took place in a private office at the Lighthouse. Participants provided written informed consent and were compensated with \$25 after

completion of the interview. Interviews were audio-recorded and lasted 1-2 hours. One trained interviewer (E.M.) conducted all interviews.

### *Data analysis*

Interview transcripts were analyzed using the framework method, a type of thematic analysis using a matrix structure to systematically reduce qualitative data (Gale et al., 2013). The first author (E.M.) used a deductive approach to develop an initial coding scheme based on the interview guide and input from a co-author (J.C.) and refined after coding of three interviews using an inductive approach and review by two co-authors (J.C. and C.K.; see Appendix C.1 for final codebook and Appendix C.2 for sample coding). The first author conducted analytic memoing to reflect on emerging themes and issues, including deviant cases. To begin the process of data abstraction, codes were then grouped into broader categories, such as a category for codes related to motivation to quit. Next, the first author charted the data into the framework matrix to provide accurate summaries by participant, category, and label. For example, responses were summarized for all codes within the motivation to quit category for each participant and label. Broader themes were developed by comparing codes and categories within and across cases with special attention to deviant cases. The framework analytic approach allowed for the data to be kept within the rich context of each case, thus enhancing rigor and transparency (Gale et al., 2013). Moreover, the matrix structure facilitated the identification of patterns and included references to specific transcript lines to make transparent the evidence supporting the themes.



## **Findings**

### *Study sample*

Characteristics of the 25 participants have been reported elsewhere (see Table 3.2). In brief, 12 men and 13 women participated and were on average 45 years old. Most were African American (n=22) and earned less than \$10,000 in the previous year (n=16). Many had not completed high school (n=12). Most reported smoking everyday (n=23). Fourteen participants reported that they had ever tried to quit, and most of these 14 participants had made at least one attempt in the previous 12 months (n=11) and many were currently trying to quit (n=8).

### *Role of labels in motivation to quit*

Participants were asked about the labels' influence on their motivation to quit and to select which labels had the most influence. Looking across the four categories of labels, they most often reported as influential the labels depicting the negative consequences of smoking to smokers, regardless of whether the label portrayed high or low threat to smokers. Participants said these labels were most likely to motivate them to quit because of their influence on risk perceptions (perceived severity and susceptibility):

Because you look at which way you going... You going to [get] a messed up heart and you going to your throat cancer or whatever he got. And oh, my God, that [label #2] speak for itself. That one speak for itself. (older man)

I have to say, this kinda changes your mind, but after going outside smoking a cigarette, you'd be smoking and you won't be enjoying it as much after this. That's how I'm feeling... you get discouraged for real... I mean you know it's harming you, but you don't know it's harming [you] to this [extent]... [W]hen you actually see a heart like this, you just be

like, “Wow.” You know what I’m saying? It really makes you think.  
(younger man)

As illustrated by these quotes, participants were motivated by the severity of the health effects portrayed on the labels and how shocking they can be when presented as a picture. Moreover, the labels made them worry about what smoking was doing to their bodies and if they would have these health conditions in the future. Some participants also reported feeling scared by the labels they said were motivational, illustrating the influence of negative affective reactions on motivation to quit.

The label reported by the most participants as motivational (label #2, Table 5.1) provided new information about the effects of smoking. One older woman described how this label was motivational for her: “Cigarettes cause gangrene. Now that I know that, yeah, I’m going to think a lot stronger about quitting.” The new information combined with the high threat picture was highly motivational to the participants, even for those who found most of the labels unmotivating.

After the labels depicting risks to smokers, participants most often identified the labels depicting negative effects to others as motivational for quitting. Perceived risk to others was often why participants found these labels motivating: The labels showed a health effect they thought was severe and others were highly susceptible to. The labels depicting a newborn, toddler, or small child were more motivating than those depicting an adult (labels #5, 7 and child in 8 versus #6 and adult in 8, Table 5.1). A major reason discussed by participants was a general moral outrage about the need to protect helpless children:

Oh, very motivating. You don’t want to hurt your kids, no one wants to

hurt their kids, that's very motivating. Definitely motivate me, I think more about my kids than I think about myself. I don't have kids, but if I did,... I would much rather... do something for them as opposed to doing it for myself. (younger woman)

This participant and several other younger men and women, many of whom did not have any children, were particularly affected by these labels and expressed concern about their future children's health and the need to quit to have healthy babies.

For men and women who currently had children or grandchildren, these labels made them concerned about their health:

My grandson have asthma real bad and he was hospitalized three times. So that made me pick [these labels]. I think more about not even only just my grandchildren, my nieces and nephews and all of them...I want to be around, healthy. I want to see my grandchildren graduate from school, get married or whatever. I want to be around. (older woman)

As described above, participants were not only concerned about the effect of secondhand smoke on their children and grandchildren, but also felt a desire to be healthy and live longer for them. In addition to feeling concern for others, these labels made them contemplate their own risk and how smoking was affecting their own health. Several participants described these labels as motivational because the labels encouraged them to think about how their future poor health and premature death would negatively impact their families emotionally: "I should consider on how the ones [in my family who] don't smoke feel about it. Sometimes it's too late and then you actually see more pain from them than you actually going through" (younger woman).

Different patterns emerged according to participants' quitting behaviors. Most of the participants who were currently trying to quit or had never tried to quit identified both types of negative labels (effects to smokers and to others) as very motivational. In

contrast, participants who were not currently trying to quit but had tried in the past were only motivated by the labels depicting their own risk from smoking.

Overall, participants were more motivated by the negative labels than the positive labels about the benefits of quitting. However, several participants found the positive labels very motivational, with a relatively equal mixture of people motivated by the benefits of quitting for smokers, benefits for others, and both. Participants stated these labels were motivational because they were hopeful messages about people who were able to quit and the benefits of quitting. They viewed some of the characters as role models for quitting. In addition, participants reported that the message of quitting for others was highly motivational and discussed their families, including spouses, children, and grandchildren, as an inspiration:

[I think about my husband] being in the house, that I'm harming him. He's the one with the secondhand smoke. And I know I love him so much – that's why I been trying to cut down, which I need to stop. But I don't want to be where as though I had done made his health bad because of my smoking. So I'm really thinking. (older woman)

Notably, none of the positive labels were motivating to participants who had made a quit attempt, but they were motivating to some participants currently trying to quit or who had never tried to quit.

#### *Factors inhibiting labels' role in motivation*

Participants also described why the labels failed to motivate them and why the labels might fail to motivate others. The most significant factor discussed by participants was that the labels failed to influence their risk perceptions in terms of both perceived

severity of and susceptibility to health conditions. For several participants, the positive labels about the benefits of quitting did not show or describe serious health conditions, which they considered necessary for motivation. When discussing the negative labels about the consequences of smoking, several participants indicated that smokers think they are unlikely to get the health conditions:

Even smoking, drinking, whatever, drugs, whatever they are doing, [older people] tend to think that if I stop now, all these ailments are going to come up all of a sudden. So I don't think the picture would really affect a lot of people if they been smoking for a long period of time because they think, "I've been smoking all this time and nothing happened yet." (older woman)

Another inhibiting factor was that some participants doubted the labels' credibility. The credibility of the characters pictured on the positive labels was questioned, such as believing that they were actors and not real people or were real people who did not actually quit. A few participants also doubted the validity of the text on both positive and negative labels, such as distrusting that smoking caused the health conditions or quitting would improve health.

Even when believed, several participants reported that the text was not motivational for themselves or others because of somewhat fatalistic attitudes; they stated that improving health and avoiding disease was not a motivating reason for them and they will get a disease even if they quit. As one older man said, "It's not an ad that I would adhere to. As far as relating this ad to cigarettes, it don't work for me... It's like I've always thought: If you're going to get [a disease], you're going to get it; if you're not, you're not. I've been smoking a long time." As described by another older man, this fatalism could be pervasive into all aspects of individuals' lives, including smoking: "A

lot of people just don't... want to try to better themselves. You got some people that just don't want to quit. Doesn't matter. 'Whatever's going to happen is going to happen.'" For these participants, the threats portrayed by the labels were not motivational.

Some participants also discussed why the labels' pictures were not motivational, including because the characters did not have inspirational stories, the characters did not correspond to the text, they had no desire to emulate the characters who quit, and the characters were not similar to them. For the labels about the effects of quitting to others, some participants stated that these labels did not apply to them because they did not currently have children (or did not plan to have children in the future). Some stated that the labels were aimed at family-oriented people, and they were not family-oriented.

Three participants reported that none of the labels were motivational, and each presents a unique case that may represent different subsets of the smoker population. An older man described a high level of intrinsic motivation to quit, such that the labels provided very little extrinsic motivation. He was motivated to quit to improve his health and to live longer and had reduced his smoking to eventually quit. He was somewhat motivated by the positive labels because he wanted to look healthy like the characters and stated quitting for others was a good message. He emphasized the need for people to motivate themselves to quit, stating, "you've got to wake up to yourself." A younger man, who had never made a quit attempt, also expressed a lot of concern about his health and was motivated to quit both to be healthier and make his family happy. However, he said he was unable to overcome his nicotine addiction and quit – in other words, he had low self-efficacy to quit. He discussed how the labels made him think about quitting sooner,

but could not motivate him to quit at the moment.

Lastly, a younger woman was not motivated by the labels because she had no desire to quit. She expressed a somewhat fatalistic attitude as well as low perceived risk from smoking, stating that she will die from something one day and it might not be from nicotine. She stated that, if smoking kills her, “so be it.” She was initially somewhat motivated by label #11 because it showed quitting as a family activity, but then became distrustful of the characters’ credibility. Overall, she was accepting of her decision to smoke and what it might lead to: “Because I’m at the point in my life that I’m going to do what I want to do, and I already know what I’m doing to myself and I got to live with that. That’s the truth I decide in me. That’s the truth I got to live with.” This quote illustrates the limited impact that labels may have on smokers who have little desire to quit.

## **Discussion**

This qualitative study fills a gap in the graphic warning label literature by exploring low-income U.S. smokers’ perceptions of different types of theory-based labels and the labels’ role in their motivation to quit smoking. We found that participants were most motivated to quit by labels portraying the negative consequences of smoking (i.e., negative labels), especially consequences to smokers; high and low threat labels were both motivational. The threat portrayed in a message—characterized by severity of and susceptibility to the health condition—motivates action through fear and by increasing individuals’ perceptions of their own risk from the unhealthy behavior (Witte & Allen, 2000). Indeed, we found that perceived severity of health effects, feelings of

susceptibility to those effects, and negative emotional reactions, such as fear, worry, and concern for others, were major reasons why participants were motivated by the negative labels. These findings are consistent with other research showing that vivid depictions of negative effects are an effective approach to promote cessation-related attitudes and behaviors (Hammond, 2011; Hammond et al., 2012).

Some negative labels failed to motivate several participants because of low perceived susceptibility. Research has shown that smokers have an optimistic bias regarding their cancer risk compared to both nonsmokers and other smokers (Weinstein et al., 2005), and increasing perceived vulnerability can increase motivation to quit (Copeland & Brandon, 2000). Vivid pictures that convey high threat of the health condition, depictions of conditions commonly experienced by smokers with a progression to more serious outcomes, and use of characters who are highly similar to smokers and susceptible to conditions are some ways in which labels could be designed to enhance feelings of susceptibility and increase their effectiveness (Mead, Cohen, Kennedy, Gallo, & Latkin, 2014).

Some participants were also motivated by the positive labels about the benefits of quitting for themselves and others. The labels were motivational because of their hopefulness, use of characters as role models for quitting, and depiction of the benefits for their and their families' health and emotional wellbeing. These findings illustrate the potential for self-efficacy and response efficacy messages on labels to motivate people to quit. Our prior work showed that participants vicariously experienced characters' quit successes portrayed on the labels, and these experiences played a role in their self-



efficacy beliefs (Mead et al., 2014). Using a narrative format to enhance vicarious experiences and overcome message resistance (Kreuter et al., 2007), labels can share the testimonials of ex-smokers who were able to quit. However, formative research is needed to develop labels with appropriate and realistic models to avoid doubts about their credibility. To increase motivation through response efficacy messages, labels can provide information about how quitting reduces the risk for smokers and others to promote message acceptance. To address the critique that positive labels did not portray a significant threat, labels could show someone who had a condition and whose health improved after quitting contrasted with someone who did not quit and experienced deteriorating health.

Notably, participants who had made a quit attempt were most motivated by labels about their own risks of smoking, rather than risks to others, and not motivated by positive labels. This finding may be attributable to their different stages of readiness to quit. Individuals at different stages of the process towards behavior change are motivated by different factors (Prochaska, Redding, & Evers, 2008). For example, smokers who are not ready to quit and may have relapsed from a previous attempt may be motivated by messages providing new information and allowing them to experience negative emotions about smoking. Indeed, participants reported these factors as motivating characteristics of the labels. Using theory and audience segmentation techniques (Prochaska et al., 2008), labels can be designed to target smokers by readiness to quit, including those who are seemingly unmotivated to quit, such as helping smokers weigh the pros and cons of quitting.

Socially-oriented messages are an untapped, potentially important avenue for future label messaging. Our finding that smokers who never tried to quit were motivated by messages about risks and benefits to others is consistent with other evidence showing they are more likely to make a quit attempt if they perceive that others desire them to quit (Clark et al., 1998). Labels can utilize this social concern to better target smokers who have never made a quit attempt. For some smokers, social concern may be the only motivational label message, as exemplified by the unique case of the younger woman who was only motivated (at least partly) by a label about family support for quitting.

Also, some evidence suggested that “fatalistic” attitudes regarding health were present in a portion of the population and these attitudes could influence the effect of the labels. Contrary to the extended parallel process model, the portrayal of threat on labels did not appear to be sufficient to motivate action in this group. This finding highlights the importance of context. The participants live within economically and socially deprived areas in which smoking may be perceived as lower risk relative to other risks in the environment, such as injection drug use, HIV, and violence. When examining the effectiveness of labels, future work should consider such fatalistic attitudes and contextual factors that may influence the impact of the labels. In addition, research is needed to examine what other factors, besides risk perceptions, might motivate smokers holding fatalistic attitudes that could be included on labels.





There are several strengths and limitations to this study. We used purposive sampling of adult smokers who were initially recruited from low-income, urban neighborhoods. Although the community-based, low SES, predominantly African-

American sample allowed for the participation of an understudied population, the transferability of the findings to other populations may be limited. The qualitative methodology allowed for an in-depth exploration of smokers' perceptions of the motivational aspects of graphic warning labels, but the cross-sectional design precludes conclusions about the causal relationship between labels and smokers' motivations and behaviors.

Our findings suggest multiple avenues for the design of future graphic warning labels that may help to increase smoking cessation in the U.S. Labels portraying negative effects of smoking, socially-oriented messages, and benefits of quitting are promising approaches to motivate cessation, and several factors that may influence the impact of labels, such as low perceived susceptibility, quit attempt history, and fatalistic attitudes, need to be examined and addressed in future work. The development and implementation of effective graphic warning labels would be an important measure to address the burden of smoking disparities in the U.S.

Tables

**Table 5.1. Characteristics of the content of graphic warning labels**

Label #	Label Image	Content Category
1	<p><b>WARNING: Cigarettes cause lung disease</b></p>  <p>Lena was diagnosed with emphysema at 42. After her diagnosis, she quit smoking by staying busy when she felt an urge to smoke.</p> <p>Call 1-800-QUIT-NOW</p>	Negative consequences of smoking to smokers
2	<p><b>WARNING: Cigarettes cause gangrene</b></p>  <p>Ask your friends and family for support to help you quit.</p> <p>Call 1-800-QUIT-NOW</p>	Negative consequences of smoking to smokers
3	<p><b>WARNING: Cigarettes cause heart disease</b></p>  <p>Call 1-800-QUIT-NOW</p>	Negative consequences of smoking to smokers
4	<p><b>WARNING: Cigarettes cause cancer</b></p>  <p>You are more likely to quit when you talk to an expert. To talk to an expert for free, Call 1-800-QUIT-NOW</p>	Negative consequences of smoking to smokers

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5

**WARNING: Smoking during pregnancy can harm your baby**



Call 1-800-QUIT-NOW

Negative consequences of smoking to others<sup>1</sup>

6

**WARNING: Tobacco smoke causes fatal lung disease in nonsmokers**



Delay smoking your first cigarette to help you quit.

Call 1-800-QUIT-NOW

Negative consequences of smoking to others<sup>1</sup>

7

**WARNING: Tobacco smoke can harm your children**



Quit smoking now to lower your children's risk of getting lung disease.

Call 1-800-QUIT-NOW

Negative consequences of smoking to others<sup>1</sup>

8

**WARNING: Smoking causes sadness, pain and death**



Don't let cravings stop you from quitting. You can quit.

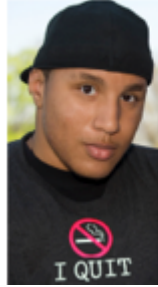
Call 1-800-QUIT-NOW

Negative consequences of smoking to others<sup>1</sup>

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9

**WARNING: Quitting will improve your health**



Your heart attack and cancer risk drop as soon as you quit.

Call 1-800-QUIT-NOW

Benefits of quitting for smokers

10

**WARNING: Quitting smoking now greatly reduces serious risks to your health**



Michael quit smoking at 40 by setting his quit date and getting rid of all his cigarettes.

Call 1-800-QUIT-NOW

Benefits of quitting for smokers

11

**WARNING: Quit to improve your children's health**



You're not just quitting for yourself. You have the power to quit.

Call 1-800-QUIT-NOW

Benefits of quitting for others<sup>1</sup>

12

**WARNING: Quit to live longer for your loved ones**



Join the thousands who quit using the Quitline.

Call 1-800-QUIT-NOW

Benefits of quitting for others<sup>1</sup>

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<sup>1</sup> Others include infants, children and adult nonsmokers

## **CHAPTER 6: DISCUSSION**

## **Summary of Findings**

This dissertation research sought to explore perceptions of theory-based graphic warning labels (including the characters on the labels) and their role in risk perceptions, efficacy beliefs, and motivation to quit. This aim was achieved through a qualitative study among 25 low-income smokers in Baltimore, Maryland, using 12 graphic warning labels developed for this study. The findings of this study contribute to the growing body of literature on graphic warning labels, particularly among low socioeconomic status (SES) populations, by using theory to develop and explore labels that varied based on the portrayal of threat, efficacy messages, characters' demographic traits, and content about the effects of smoking and quitting to the smoker and to others.

**Aim 1: To explore participants' perceptions of graphic warning labels with a threat message, an efficacy message, and a threat + efficacy message across several health topics and their role in risk perceptions and efficacy beliefs.**

Manuscript 1 (Chapter 3) explored participants' reactions to efficacy messages on labels and perceptions about which labels showed the highest level of harm from smoking (perceived severity), showed a health effect likely to happen to them if they did not quit or made them worry the most about their smoking (perceived susceptibility), and made them feel confident that they could quit if they wanted to (self-efficacy belief). Labels were compared by threat level (portrayal of a high, low, or no threat) and type of self-efficacy message (social persuasion, vicarious experience, or mastery experience). Many participants responded favorably to the social persuasion and vicarious experience self-efficacy messages; they reported that the social persuasion messages were credible



and helpful for quitting, while the vicarious experience messages showed role models whom they could emulate for quitting. However, most participants responded negatively to the mastery experience self-efficacy messages, stating that the labels lacked credibility and they could not accomplish the behavioral step described in the label.

Efficacy messages in which participants vicariously experienced the characters' quit successes were reported as most influential to self-efficacy beliefs because they showed characters who were role models for quitting and showed the health and social benefits of quitting. In addition, participants reported that labels with a self-efficacy message and no depiction of the threat from smoking had the most influence on their self-efficacy beliefs, followed by labels that depicted a high threat. As described by participants, labels with a self-efficacy and no threat message increased their confidence to quit because of the characters' role modeling and depiction of the benefits of quitting. For labels with a self-efficacy and high threat message, the most commonly reported factor that influenced confidence was a desire to avoid the health condition and improve their overall health.

When asked about the influence of the labels on their risk perceptions, participants reported that labels portraying a high threat were most influential to their perceived severity of and susceptibility to smoking risks because of the vivid picture, negative affective reactions, and clarity and newness of information provided.

**Aim 2: To explore participants' perceptions of their similarity (and dissimilarity) to the characters on graphic warning labels.**

Manuscript 2 (Chapter 4) explored participants' perceptions of the characters portrayed on the labels, their perceived similarity and dissimilarity to the characters, and the factors that promoted perceived similarity and dissimilarity. Participants more commonly reported feeling similar to the positive characters who showed the benefits of quitting than the negative characters who showed the negative consequences of smoking. The most commonly described reasons for feeling similar to characters were aspiration to be like the characters, feeling similar emotions (such as happy or upset), and experiencing similar health conditions or treatments (such as hospitalization or difficulty breathing), attitudes (such as having a positive outlook), and life experiences. Age and gender concordance between the character and participant played a small role, but participants reported that racial concordance played no role. The most commonly reported reasons for feeling dissimilar to characters were that they did not have similar health conditions or supportive familial and romantic partner relationships. Age concordance was more commonly a reason for similarity or dissimilarity for younger compared to older participants.

Most of the participants reported that the characters on the labels were credible. As discussed by participants, factors that enhanced the believability of the characters included the credibility of the emotions they portrayed, their healthiness after quitting, their appearance as real people (not actors), and their experiences coinciding with participants' experiences and expectations. Characters were described as not believable when they appeared to be actors and not real people, their emotions did not appear to be genuine, or the labels did not provide enough information about them. These doubts may

have influenced message salience and acceptance. In addition, confusion about the message arose when participants perceived that the characters did not match the text.

**Aim 3: To explore the role of graphic warning labels in motivation to quit.**

Manuscript 3 (Chapter 5) explored perceptions of the motivational impact of graphic warning labels, factors that facilitated the motivational impact, and factors that inhibited the motivational impact. Labels were compared across four content categories: negative consequences of smoking to the smoker, negative consequences of smoking to others (including infants, children, and adults), benefits of quitting for the smoker, and benefits of quitting for others. Participants most often reported as influential the labels depicting the negative consequences of smoking to smokers, regardless of whether the label portrayed high or low threat to the smoker. They reported being motivated by the labels' influence on their risk perceptions (perceived severity and susceptibility), negative affective reactions to the labels, and provision of new information.

The next most motivational labels were those portraying the negative consequences of smoking to others, particularly for infants and children. Reasons included perceived risk (both severity and susceptibility) to others, a moral duty to care for children, concern for the health of their own children and grandchildren, and encouragement to think about their own health. Younger participants who did not have children (and planned to have children in the future) were particularly affected by these labels and the need to protect the health of their future children.

Several participants were also motivated by the labels about the benefits of quitting for themselves and others. They described these labels as motivational because

of their hopefulness, use of characters as role models for quitting, and the desire to improve the health of their family and create stronger bonds with their family. Notably, participants who had made a quit attempt were most motivated by labels about their own risks of smoking, rather than risks to others, and not motivated by labels about the benefits of quitting. In contrast, participants who were currently trying to quit or had never made a quit attempt reported all types of labels as motivational.

Participants also discussed why the labels failed to motivate them and why the labels might fail to motivate others. Most commonly reported reasons included the lack of impact on their perceived severity of and susceptibility to smoking-related health conditions, low credibility of the labels, and believing that getting a disease is part of fate, no matter if they quit. Three unique cases of participants who were unmotivated by any label provided insights into the motivational impact of labels within different subsets of the smoker population, such as the need to address self-efficacy to overcome nicotine addiction in order to increase motivation among those with low self-efficacy and the potential of socially-oriented labels portraying real people to increase motivation among those who are highly unmotivated to quit.

### **Integration of Findings**

These findings support and address gaps in the existing literature on the effectiveness of graphic warning label content among low-income smokers (Cismaru & Lavack, 2007; Hammond, 2011; Strahan et al., 2002). Guided by communication and behavioral theories and theoretical constructs, the findings elucidate the potential pathways through which graphic warning labels may promote motivation to quit and quit

attempts. High threat labels were reported as increasing perceived risk from smoking and causing fear and worry about the risks of smoking, and these high risk perceptions and negative emotional reactions to the labels were reported as being very motivational for quitting. This is consistent with other evidence that vivid depictions of the physical effects from smoking (i.e., high threat portrayals) are more effective than nonvivid pictures in changing cessation-related attitudes and behaviors (Berg et al., 2011; Hammond, 2011; Hammond et al., 2012; Kees et al., 2010; Thrasher, Arillo-Santillan, et al., 2012; Thrasher, Carpenter, et al., 2012).

In contrast to other research showing limited impact on efficacy beliefs (Berg et al., 2011; Hammond et al., 2004; Romer et al., 2013; Schneider et al., 2012), this study illustrated that theory-based efficacy messages on graphic warning labels may influence self-efficacy beliefs in smokers. In particular, role model-based efficacy messages using a testimonial, narrative format with former smokers is a promising approach. Viewing characters as role models for quitting was also reported as motivational. Therefore, labels with role model-based efficacy messages may help increase motivation to quit.

The findings also shed light on ways in which the characters and perceived similarity to the characters portrayed on labels can enhance or diminish the influence of the labels on efficacy beliefs, risk perceptions, and motivation to quit. Aspiration to be like the characters was a commonly reported reason for similarity, and might enhance the influence of a role model-based efficacy message on self-efficacy to quit. Shared health condition was also a common factor by which participants judged similarity to characters, and might enhance smokers' feelings of susceptibility to life-threatening health outcomes

if they see a character with a similar health condition progress to a serious outcome. In addition, the findings show that perceptions of the characters' credibility can influence not only perceived similarity but also the motivational impact of labels.

### **Limitations**

The inclusion of low-income smokers in Baltimore and the sampling by age group and gender helped capture the perspectives of low SES smokers and variations in responses by age and gender. Findings may be transferable to smokers living in similar low-income, urban settings. However, the findings may not be transferable to high SES smokers or smokers living in other cities or rural settings. Social desirability bias is a potential concern because smoking has become a non-normative behavior in the U.S.; that is, there is a low prevalence of smoking nationally. However, this bias may be low in the study because smoking is likely highly normative (i.e., prevalent) in the neighborhoods where the participants live, so it may not be stigmatized.

The exposure to the graphic warning labels was relatively short and did not mimic a real-world setting. It is possible that longer exposure to the labels would enhance their impact on cessation-related cognitive factors such as motivation to quit. However, the aim of the study was to explore their initial perceptions of the labels, which was accomplished within the 1-2 hours of the interview. The cross-sectional design did not allow for an examination of changes in attitudes and behaviors in the study sample after exposure to the graphic warning labels; thus, conclusions cannot be made about the impact of labels on cessation outcomes.

## **Strengths**

To my knowledge, this research is the first to use well-established communication and behavioral theories and theoretical constructs to develop and explore threat and self-efficacy messages, characters, and self- versus socially-oriented content on graphic warning labels. The study used different types of self-efficacy and threat messages based on theory and scientific evidence to explore the perceived influence of labels on self-efficacy beliefs and risk perceptions, which addressed a significant gap in the literature. In addition, this dissertation research provides an initial step to further study perceptions of characters and how to design labels to enhance their credibility. Lastly, the findings suggest approaches to motivate smokers who may be more difficult to motivate: those who have never tried to quit before and those who have little desire to quit.

The sampling strategy by gender and age group ensured sufficient representation to capture potential differences. In addition, the community-based, low-income, predominantly African-American study sample allowed for the participation of an understudied population. Moreover, qualitative methods helped contextualize participants' perceptions of and responses to the labels.

## **Implications and Recommendations**

### *Graphic warning label policy implications*

This study highlights several important areas for future work in graphic warning label development. Labels with testimonial narratives from former smokers who were able to quit and show the physical, psychological, and social benefits of quitting is a promising approach to promote self-efficacy and motivation to quit. The characters can

serve as role models for quitting, and a testimonial format may help overcome some doubts of the credibility of characters. The portrayal of characters who are healthy, happy, and free of cigarettes can influence smokers' aspiration to be like the characters (an important factor for perceived similarity), thus enhancing the influence of the labels on self-efficacy to quit.

Labels could also employ vicarious experience to enhance risk perceptions through the portrayal of a character's progression from commonly experienced, minor health effects from smoking (such as a "smoker's cough") to more serious life-threatening outcomes (such as fatal lung disease). This study found that participants perceived themselves as similar or dissimilar to characters based on shared health conditions, that vivid pictures enhanced feelings of susceptibility and severity, and that risk perceptions motivated smokers to quit. These findings together suggest that the progression from minor to life-threatening outcomes might be highly motivational to smokers. To accomplish this, the front panel of the cigarette pack could have a label showing a credible character experiencing a minor symptom with a nonvivid (low threat) picture. The back panel could have a label showing that same character experiencing the life-threatening outcome in the future with a vivid (high threat) picture. Using this approach, smokers might identify with the character on the front panel because of the shared health condition and have higher risk perceptions once they view the character on the back panel. The additional use of a testimonial format might enhance the vicarious experience to a greater degree.



In addition, labels could compare healthy and unhealthy characters to increase motivation to quit. This study found that the labels about the benefits of quitting played a role in self-efficacy beliefs and motivation to quit; however, a commonly reported barrier to their motivational influence was that they did not portray a threat. To overcome this challenge, the front panel of the cigarette pack could have a label portraying a character suffering from the health effects of smoking, while the back panel could show the same or a different character who was able to improve his or her health and avoid disease by quitting. Alternatively, labels could show a character who did not quit and experienced deteriorating health on the front panel contrasted with a character who had a condition and whose health improved after quitting on the back panel. Using either approach, the front panel might grab the viewer's attention, increase risk perceptions, and create negative emotional reactions such as fear, and the back panel might increase efficacy beliefs through a role model illustrating the effectiveness of quitting on improving health. Indeed, these approaches would closely follow the recommendations of the extended parallel process model by using fear and perceived risk to motivate action and efficacy to motivate taking the recommended action (Witte, 1992).

Socially-oriented labels showing the effects of smoking and quitting to others may be an effective approach to motivate smokers to quit, even among smokers who have never attempted to quit before and smokers who have little desire to quit. In particular, the physical, psychological and social benefits of quitting for others have been unemployed in graphic warning label development and may be a new avenue for future labels to exploit.

Audience segmentation is a useful approach in health communication that may aid in the development of graphic warning labels (Storey, Saffitz, & Rimón, 2008). It is defined as “the identification of relatively homogeneous subgroups and the development of marketing strategies customized to the unique characteristics of each subgroup” (Storey et al., 2008, p. 443). The assumption of audience segmentation is that the subgroups have different worldviews with different values and beliefs and respond better to some types of messages. This study found that participants responded differently to self-efficacy messages and information about the effects to smokers versus others on labels according to their quit attempt status (currently trying to quit, previously attempted to quit, and never attempted to quit). In addition, the research showed some evidence to suggest that somewhat “fatalistic” worldviews about getting disease, intrinsic motivation to quit, and low self-efficacy to quit might play a role in how participants responded to different types of labels. Therefore, the influence of labels might be enhanced if they were designed with different subgroups in mind. For example, smokers with fatalistic attitudes might respond more readily to labels providing more information about the benefits of quitting and their ability to avoid disease or more information about the benefits of quitting besides those related to health (such as financial savings). In contrast, smokers who perceive low risk from smoking might respond more readily to labels providing new information about the risks emphasizing severity of and susceptibility to these risks.

#### *Future research recommendations*

The qualitative findings and recommendations for label design in this study warrant testing using an experimental research design. Future experimental studies should test the effectiveness of labels with testimonial narratives from former smokers who are role models for quitting and the benefits of quitting, the progression of characters from minor to life-threatening outcomes, the comparison of healthy and unhealthy characters, and socially-oriented labels. To my knowledge, these labels have not been tested previously.

The outcome measures warranted for an experimental study include changes in risk perceptions (including severity and susceptibility), efficacy beliefs (including self-efficacy to quit and response efficacy of quitting and the Quitline), motivation to quit, and intentions to quit after viewing the labels. Moreover, cessation behaviors, including reduction in smoking, calling the Quitline, and quit attempts, should be assessed after a short follow-up period to determine longitudinal impact of labels on behaviors. An interesting outcome measure not explored in other research would be discussion of the labels with one's family, friends, and acquaintances to examine the potential for the diffusion of labels' messages through social networks. Potential moderators to investigate include perceived similarity to the characters and quit attempt status to determine whether these factors enhance or diminish the effects of the labels.

In addition, this dissertation study gathered data about participants' conscious judgments of similarity to characters but was not able to determine participants' subconscious decision-making about factors that enhanced and diminished similarity to characters. Although this study found that age and gender concordance played a small

role and race/ethnicity concordance did not, these factors may play a more substantial subconscious role. This hypothesis can be tested by randomizing participants to view labels with characters that match them on a demographic trait (such as race/ethnicity) and analyzing data to see if they rated these characters as more similar to themselves than participants who viewed discordant characters.

The use of credible characters is important to enhance the effect of role modeling-based efficacy messages and motivation to quit. This study found several factors that may have affected perceived credibility, including the use of real people versus actors, emotions portrayed by the characters, and amount of information provided. In addition, some evidence suggested that the appearance of the characters, such as their dress, might have affected credibility and perceived similarity. In the development of role models for labels, further qualitative exploration followed by experimental testing is needed to verify their credibility before implementation on cigarette packs.

As discussed previously, audience segmentation is a promising approach for future label design, but further research is needed to determine the most useful segmentation groups. This study found that quit attempt status might be a useful way to segment the audience for warning labels. In addition, smokers' previously held risk perceptions and efficacy beliefs (prior to viewing the labels) and stage of readiness to quit might be effective guides to segment the audience (Prochaska et al., 2008; Rimal & Real, 2003). These suggestions are places to start for future research.

## **Conclusions**

This dissertation research identifies key factors that influence the effectiveness of graphic warning labels and provides new areas for label development and research. The reduction of label effectiveness over time means that new labels need to be developed and implemented periodically. As demonstrated by this study, well-established, evidence-based communication and behavioral theories and theoretical constructs provide useful approaches for enhancing the effectiveness of labels by influencing risk perceptions, efficacy beliefs, and motivation to quit. The development of labels with low socioeconomic status populations may help address potential barriers to their impact in these populations and, thus, smoking disparities in the U.S.

## **APPENDICES**

## Appendix A: Graphic Warning Labels

### WARNING: Cigarettes cause lung disease



Lena was diagnosed with emphysema at 42. After her diagnosis, she quit smoking by staying busy when she felt an urge to smoke.

Call 1-800-QUIT-NOW

### WARNING: Cigarettes cause gangrene



Ask your friends and family for support to help you quit.

Call 1-800-QUIT-NOW

### WARNING: Cigarettes cause heart disease



Call 1-800-QUIT-NOW

### WARNING: Cigarettes cause cancer



You are more likely to quit when you talk to an expert. To talk to an expert for free,

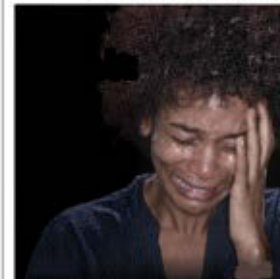
Call 1-800-QUIT-NOW

### WARNING: Smoking during pregnancy can harm your baby



Call 1-800-QUIT-NOW

### WARNING: Tobacco smoke causes fatal lung disease in nonsmokers



Delay smoking your first cigarette to help you quit.

Call 1-800-QUIT-NOW

### WARNING: Tobacco smoke can harm your children



Quit smoking now to lower your children's risk of getting lung disease.

Call 1-800-QUIT-NOW

### WARNING: Smoking causes sadness, pain and death



Don't let cravings stop you from quitting. You can quit.

Call 1-800-QUIT-NOW

**WARNING: Quitting will improve your health**



Your heart attack and cancer risk drop as soon as you quit.

Call 1-800-QUIT-NOW

**WARNING: Quitting smoking now greatly reduces serious risks to your health**



Michael quit smoking at 40 by setting his quit date and getting rid of all his cigarettes.

Call 1-800-QUIT-NOW

**WARNING: Quit to improve your children's health**



You're not just quitting for yourself. You have the power to quit.

Call 1-800-QUIT-NOW

**WARNING: Quit to live longer for your loved ones**



Join the thousands who quit using the Quitline.

Call 1-800-QUIT-NOW



## **Appendix B: Interview Guide**

*Read: Thank you for your interest in our study. I am going to show you different health warning labels that are designed to be on cigarette packs. These warning labels are full-color pictures of the health effects of smoking. We'll be looking at 12 of these warnings in total. Some may make you feel uncomfortable. We're interested in hearing what your thoughts are about the labels. There are no right or wrong answers.*

[Throughout the interview, dictate the graphic warning label number for the audiorecording.]

[Shuffle the cards to randomize.]

### **Reactions**

*First, we will look at the labels one at a time.*

[Give the participant one label.]

*Take your time and look at this label. When you are ready, I will ask you some questions about the label.*

1. Tell me about the first thing you noticed as you looked at this warning label.
  - a. What things come to mind when you look at this label?
  
2. Tell me about the message that you think this label is trying to get across.
  - a. Does it make sense with what you know?
  - b. Was there any new information that you didn't know before?
  - c. Did anything surprise you?
  - d. *Probe on subtext if present and if it doesn't come up:* What did you think about this text here? Does it make sense with what you know?
  
3. How did the label make you feel?
  - a. What did you notice more: the text or the picture?

[Repeat the above procedures and questions for each label one at a time. Once finished with all of the labels, move on to the next section.]

### **Risk Perceptions**

*Now we will discuss all of the labels together.*

[Give the participant all of the labels.]

4. Which labels show a health effect that seems very harmful? Tell me about why you chose those labels.
  - a. *Probe if s/he picks all or most of the labels for 'very harmful':* What would be your top three labels? Why those three?
  - b. Which labels show a health effect that seems not at all harmful? Tell me about why you chose those labels.

- c. How much did the text versus the picture influence your piles? Which did you look at more when deciding what pile to put it in?
5. Which labels make you worry the most about your smoking?
  6. Which labels make you think that the health effect is likely to happen to you?

### **Efficacy Perceptions**

7. Now, think about how effective the labels are on motivating you to quit smoking. Tell me about which labels are very likely to motivate you to quit. Why?
  - a. Which are least likely to motivate you to quit? Why?
  - b. How much did the text versus the picture influence your piles? Which did you look at more when deciding what pile to put it in?
8. Tell me about which labels make you feel more able to quit smoking. Why?
  - a. *Probe on subtext if present and if it doesn't come up:* What did you think about this text here? Does it make sense with what you know?
9. Tell me about which labels would motivate you to call the Quitline. Why?
  - a. *For labels with a Quitline response efficacy message, probe on subtext if it doesn't come up:* What did you think about this text here? Does it make sense with what you know? How credible is it?

### **Perceived Similarity to Character**

[Pull out the labels with people pictured]

10. These labels show pictures of people who have some health effect from tobacco smoke, either their own or secondhand smoke from others, or some benefit of quitting. Which people do you think are most like you? Why?
  - a. Tell me about why you thought these other people were not like you. What's different?
  - b. Tell me about the changes that you would make to these warnings so that the people pictured would seem more like you.
  - c. Did you look at all at demographic factors, like the person's age, race, or gender?

[Give all labels back to participant]

### **Conclusion**

11. Tell me about the changes that you would make to these warnings to better motivate you to quit.
 

*Potential probes if needed:*

  - a. *If person didn't seem very motivated to call the Quitline:* What changes to motivate you to call the Quitline?

*If person seemed unaffected by the warnings of harm:* What changes would make the effects seem very harmful? Make you worry more about smoking?

## Appendix C: Data Analysis

### Appendix C.1: Final Codebook

CODE	DEFINITION
<b>EMOTIONAL AND COGNITIVE REACTIONS</b>	
Emotional	Emotional reactions the labels, such as sadness, anger, fear, disgust, worry, etc. (excluding confusion)
Credibility	Perceptions of the credibility, believability, or accuracy of the label
Relevance	How relevant or irrelevant a label or attribute(s) of a label are
Newness	What surprised them and what was new to them (if anything) on the label
<b>RISK PERCEPTIONS</b>	
Severity	Discussions of how harmful the health effects from the labels seem, including which labels they thought were very harmful (or not at all harmful)
Susceptibility	Feelings of their vulnerability to the health effects shown on the labels, including which labels showed a health effect they thought seemed likely to happen to them and which labels made them feel worried about the effects of smoking.
<b>MOTIVATION TO QUIT</b>	
Quitmotiv	Discussions about how motivated or unmotivated they are to quit
QuitmotivLabel	The impact of the labels on their (or other smokers') motivation to quit or take another action towards quitting, including seeking more information and which labels were most likely and least likely to motivate them.
<b>EFFICACY BELIEFS</b>	
LabelSE	Their thoughts on the self-efficacy messages on the labels, Including how helpful and feasible it is
QuitSE	Discussions about their confidence in their ability to quit (self-efficacy), including why they can or cannot quit
QuitSELabel	The impact of the labels on their confidence to quit, including which labels made them feel more able to quit.
LabelRE	Their thoughts on the response efficacy messages on the labels
Qline	Discussions about how motivated or unmotivated they are to call the quitline and why, including perceived effectiveness of the quitline
QlineLabel	The impact of the labels on their perceptions of the quitline and their motivation to call the quitline
QuitRE	Discussions about the effectiveness of quitting on improving health (response efficacy)

QuitRELabel	The impact of the labels on their perceptions of the effectiveness of quitting on improving health
<b>CHARACTERS ON LABELS</b>	
Aspiration	Any feelings about wanting to be more like (or not like) a character or in a character's situation, such as wanting to quit like the character did, wanting to look healthy like a character, or wanting to be unhealthy like a character. Does not apply to labels 2, 3, 5, and 7 because they do not show characters.
Character	General discussions of the character, including traits, appearance, etc.
Similarity	Discussions of perceived similarity to the characters, including which labels showed a character they felt was like them in some way
Dissimilarity	Discussions of perceived dissimilarity to the characters
SimilarChange	What changes they would make to the characters to make the characters seem more like them

**Appendix C.2: Sample Coding**

<b>CODE</b>	<b>DEFINITION</b>	<b>SAMPLE QUOTES</b>
<b>EMOTIONAL AND COGNITIVE REACTIONS</b>		
Emotional	Emotional reactions the labels, such as sadness, anger, fear, disgust, worry, etc. (excluding confusion)	<p><b>ELM:</b> Okay. How did this label make you feel when you saw it? Did any emotions or feelings come up?</p> <p><b>4007:</b> I just was surprised and shocked. That being said, I don't really-- it's sort of unbelievable. I mean, I've been smoking for years and I've never heard this.</p> <p>[Double coded with Credibility]</p> <p>.....</p> <p><b>ELM:</b> How did the label make you feel?</p> <p><b>4048:</b> Scared.</p> <p><b>ELM:</b> Can you tell me more about why it made you feel that way?</p> <p><b>4048:</b> Because I don't want to be sick. I said that before, though. And I don't want to die.</p> <p>[Double coded with Severity and Susceptibility]</p> <p>.....</p> <p><b>ELM:</b> Is this a believable message? ... That your heart could look like that?</p> <p><b>4048:</b> Yes. I mean, I wouldn't want <i>my</i> heart to look like that. I didn't see any healthy hearts at doctor's offices and stuff like that, but-- mm-mm.</p> <p><b>ELM:</b> Why does it look unhealthy?</p> <p><b>4048:</b> It look dysfunction. It look like it's uncolored and discolored, and... eww.</p> <p>[Double coded with Severity and Credibility]</p>
Credibility	Perceptions of the credibility, believability, or accuracy of the label	<p><b>ELM:</b> Is it a believable message?</p> <p><b>4007:</b> I mean I don't-- I guess, I don't know.</p> <p><b>ELM:</b> I guess given what you know about smoking and what it can do, is that something that makes sense or not so much?</p> <p><b>4007:</b> Not so much, no.</p> <p><b>ELM:</b> Okay. Can you tell me more about why you say that?</p> <p><b>4007:</b> Well, I thought cigarettes had more to do with the lungs and the heart and stuff like that. I didn't know about-- I don't know about this.</p> <p>[Double coded with Newness]</p> <p>.....</p> <p><b>ELM:</b> What did you think about the part here where it says your heart attack and cancer risk drop as soon as you quit?</p>

		<p><b>4047:</b> Well, that's exciting, but I probably would need to do more research in saying that it stops that fast, because of the damage that you probably have already done. But it's good to know that if you stop smoking immediately your risk is pretty much zero. That's good.</p> <p><b>ELM:</b> You said though you'd need to do some research first to see if that's right?</p> <p><b>4047:</b> Well, I don't-- that's just me as far as believing that by stopping that suddenly that all your risk is over-- kind of like not sure of that. But if it is true, it's good to know.</p> <p>[Double coded with LabelRE and QuitRELabel]</p> <p><b>ELM:</b> The next label we'll talk about is label number nine.</p> <p><b>4048:</b> This a good one.</p> <p><b>ELM:</b> Why do you say that?</p> <p><b>4048:</b> Because he look healthy, he got a "Quit" sign on his T-shirt... and he's feeling better, he's looking healthy, and he's bragging about it. He want everybody-- it stops heart attacks and cancer. Risks drop as soon as you quit. This is a more happy, not a sad, picture. More happy picture. Quitting will improve your health-- I believe that. I don't think I would walk around with a T-shirt saying I quit.</p> <p>[Double coded with Character, Emotional, and LabelRE]</p>
Relevance	How relevant or irrelevant a label or attribute(s) of a label are	<p><b>4007:</b> Quitting for your children's health. Well, I don't have any children so-- but I have nieces and nephews.</p> <p><b>ELM:</b> So you feel like that message isn't so relevant for you?</p> <p><b>4007:</b> Right, yeah.</p> <p><b>ELM:</b> Anything else come to mind as you look at it?</p> <p><b>4007:</b> Well, they're a nice looking family.</p> <p><b>ELM:</b> Does it remind you at all about your family?</p> <p><b>4007:</b> Not really. We don't have that many people in my family. But the text part, "You're not just quitting for yourself" like I said, I have nieces and nephews, young. My niece just had a baby, a baby girl. She's like two weeks old so I would-- I</p>

		<p>don't want to have heart disease or lung cancer and not be able to be around to watch her grow up and then I don't want to be smoking even-- like I said, I don't smoke around them but I just want to be able to be around for them also be a good role model for them and not-- because already one of my nephews is smoking. He smokes, my oldest nephew. He's 21, he smokes.</p> <p>[Double coded with Character, Aspiration, Dissimilarity, LabelSE, QuitmotivLabel, and Similarity]</p> <p>.....</p> <p><b>ELM:</b> Next we'll talk about label number eleven.</p> <p><b>4047:</b> Well, to me, it seems like the further we go into some of these pictures is dulling me as far as boring, to the point that the warning is not really discussing the true matter and it's gone beyond that, because-- and smoking for me, for instance, is really it's like a problem that's within me that I need to address. And I wouldn't bring my family into it in that manner. Sometimes it can push people away because it's like a one-on-one address. You need to start within yourself to make all these things possible. So this warning here, it's nothing. It doesn't move me in any kind of way. It doesn't make anything new or old. It's something I probably wouldn't even pay too much attention to.</p> <p>[Double coded with QuitmotivLabel]</p> <p>.....</p> <p><b>4048:</b> "Smoking during pregnancy can harm your baby." Now, I know this, because when I got pregnant, I stopped smoking, drinking, and everything. I didn't want my baby to be hurt. So I already know that. And that baby look like he's sick.</p> <p><b>ELM:</b> Did you know already that it could make a baby look like that?</p> <p><b>4048:</b> Yes. I mean, I know it make a baby sick, but if you smoking, it's going to the baby-- the baby inside you. Like I said, when I got pregnant-- I got a son that's 21-- I stopped smoking, drinking, everything, when I found out I was pregnant, and I didn't want nobody around me smoking, drinking, or nothing. &lt;laughs&gt; I was giving everybody headaches.</p>
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		[Double coded with Credibility and Severity]
Newness	What surprised them and what was new to them (if anything) on the label	<p><b>ELM:</b> Did anything surprise you at all on the label?</p> <p><b>4007:</b> The way this baby look. I never saw a baby that-- from the effects of smoking, the way a baby can look from the effects of smoking. It's my first time seeing it.</p> <p>.....</p> <p><b>ELM:</b> Next we'll talk about label number two. Tell me about the first thing you noticed as you looked at this warning label.</p> <p><b>4047:</b> Well, the first thing I noticed that there has been some kind of deformation have taken place in someone's foot. Which I guess guides me to read what happened, which I had no idea that smoking could do something of that sort. So this is new, and makes me very concerned. And would make me want to quit a little better than what I did before.</p> <p><b>ELM:</b> Any other things come to mind as you look at this label?</p> <p><b>4047:</b> How devastating smoke can be to you. Not just your upper body but your body period. So I don't want to just-- which I was labeling just certain things, but boy was I wrong.</p> <p>[Double coded QuitmotivLabel, Emotional, Susceptibility, and Severity]</p> <p>.....</p> <p><b>ELM:</b> Did anything surprise-- oh, yeah. You said how young he was surprised you. So this part about the heart attack and cancer risk dropping as soon as you quit, that wasn't very surprising?</p> <p><b>4048:</b> Yeah-- no, because I already know that. I mean, they things you know. But seeing him so young, that would surprise me. Usually, you see older people.</p> <p>[Double coded with Character]</p>
<b>RISK PERCEPTIONS</b>		
Severity	Discussions of how harmful the health effects from the labels seem, including	<p><b>ELM:</b> Can you pull out the labels that you think show a health effect that seems very harmful? I want the ones that seem the most harmful.</p> <p>...</p> <p><b>4007:</b> These.</p> <p><b>ELM:</b> ... So you said number five, number eight, number two, number three and number four.</p>

	<p>which labels they thought were very harmful (or not at all harmful)</p>	<p>What was it about those five?  <b>4007:</b> Well, this guy's smoking out of a hole in his neck. Can't get more harmful than that. The heart one shows the heart is clearly damaged. This one with gangrene, I mean, this foot is terrible. It's like irreparably injured and just messed up. This baby that's probably premature and got all kinds of problems. And this guy who look like he about to die.  .....  <b>ELM:</b> What was different about the other labels? Why didn't you pick any of the other ones?  <b>4007:</b> Well, this lady-- excuse me. Well, this guy, he quit. [label #9] This lady... She's just upset. She's crying. [label #6]  <b>ELM:</b> ... So she didn't look like she had a health effect?  <b>4007:</b> No, uh-uh. Michael, he quit. [label #10] This family talking about quitting. [label #11] The baby is around smoke and it's no health effects yet. [label #7]  <b>ELM:</b> Yeah, I guess before you came into the interview today, how would you describe your level of interest in quitting? Like pretty low, or--?  <b>4047:</b> Well, it was moving along because I do have heart problems and I have to stop smoking. So I went from several packs a day to possibly a half a pack a day. So things are improving, but now that I even know that, might even improve faster, because I really see that it's not a joke. [Double coded with Quitmotiv and QuitmotivLabel]  .....  <b>ELM:</b> I've heard different theories. What do you think it looks like?  <b>4048:</b> It look like somebody got on gloves and is holding a heart in their hand. Well, what is that green stuff? Oh, my God. It don't look healthy, I know that. "Cigarettes cause heart disease." Ooh! Ooh! Get the chills. Don't want to get that one. &lt;laughs&gt;  [Double coded with Emotional]</p>
Susceptibility	Feelings of their vulnerability to	<p><b>ELM:</b> Are there any health effects that you think are more likely to happen to you than the other ones if you don't quit?</p>

	<p>the health effects shown on the labels, including which labels showed a health effect they thought seemed likely to happen to them and which labels made them feel worried about the effects of smoking.</p>	<p><b>4007:</b> Cancer or lung disease [labels #1 and 4] ... And they're going to eventually lead to death [label #8]... because I've seen those happen with my own two eyes to people. So I worry about those the most.  [Double coded with Emotional]  .....  <b>ELM:</b> What's the main message you think this label's trying to get across?  <b>4007:</b> I'm damaging my heart. Cigarettes damage your heart.  .....  <b>ELM:</b> Do you think the quit line is something-- how would you rate your level of interest in the quit line, or how much it might help you or not help you?  <b>4047:</b> I don't know, I never read it and never thought about anything. I felt that with the information that I received about my heart, knowing I can't smoke, and I shouldn't, it's more vulnerable to me than anything. So I went to another level &lt;inaudible&gt;.  [Double coded with Qline]  .....  <b>ELM:</b> That's likely to happen?  <b>4048:</b> Yeah, cancer. [label #4] ... All of them are likely, but--  <b>ELM:</b> Right. What was it about that one that makes you single that one out?  <b>4048:</b> The hole in the throat, and smoke coming out. I mean... that's not a pretty picture.  [Double coded with Severity]</p>
<b>MOTIVATION TO QUIT</b>		
<p>Quitmotiv</p>	<p>Discussions about how motivated or unmotivated they are to quit</p>	<p><b>ELM:</b> Is that something that you have-- you have family and friends who've been trying to get you to quit like you were saying before?  <b>4007:</b> I mean, I don't have people in my life that particularly bother me about it but when I try to quit, I have a lot of support. I've tried to quit about four times in the past six months.  [Double coded with LabelSE]  .....  <b>ELM:</b> Yeah, I guess before you came into the interview today, how would you describe your level of interest in quitting? Like pretty low, or--?  <b>4047:</b> Well, it was moving along because I do have heart problems and I have to stop smoking.</p>

		<p>So I went from several packs a day to possibly a half a pack a day. So things are improving, but now that I even know that, might even improve faster, because I really see that it's not a joke. [Double coded with QuitmotivLabel and Severity]</p> <p>.....</p> <p><b>ELM:</b> What came to mind as you were looking at this label?</p> <p><b>4048:</b> I want to stop smoking... I don't want to be looking sick and have lung disease. And I'm 48. She 42, and she look like she's 65. She look older... from smoking. [Double coded with Aspiration, QuitmotivLabel, and Severity]</p>
QuitmotivLabel	<p>The impact of the labels on their (or other smokers') motivation to quit or take another action towards quitting, including seeking more information and which labels were most likely and least likely to motivate them</p>	<p><b>ELM:</b> Of the other labels are there any in particular that if you saw them on a pack of cigarettes they would be very unlikely to motivate you?</p> <p><b>4007:</b> Least likely to motivate me. Least likely. These four.</p> <p><b>ELM:</b> So it's numbers seven, 10, five and 11. Can you tell me about why you chose those?</p> <p><b>4007:</b> I don't plan on getting pregnant [label #5] and... Yeah, for the smoking during pregnancy. I don't have any children, and if I did I wouldn't smoke around them, so "Quit to improve children's health," that's number 11. I told you about Michael. He just looks like a ad, "Quitting smoking now greatly reduces serious risks to your health." That's number 10. And then "Tobacco smoke can harm your children." I would never do this right here. Never ever, ever, ever. So it wouldn't even affect me if I saw that on there. [Double coded with Character and Relevance]</p> <p>.....</p> <p><b>ELM:</b> Next, we'll talk about number six.</p> <p><b>4047:</b> Nothing... The picture itself turned me off and that information is written. So, a lot of times if wasn't here, if you were just looking at the picture, it would make me not even read the rest of it. So, I don't find anything that's catching my eye that can move me on what I see here.</p> <p>.....</p> <p><b>ELM:</b> Okay. So it was numbers one, two, three, four, five, and six. Okay. Those ones are very</p>

		<p>likely to motivate you?  <b>4048:</b> To stop.  ...  <b>ELM:</b> Tell me why you picked out these labels.  <b>4048:</b> Because they the more diseases-- harmful diseases.  <b>ELM:</b> They seem like they would be really bad to have?  <b>4048:</b> Yeah.  [Double coded with Severity]</p>
<b>EFFICACY BELIEFS</b>		
QuitSE	Discussions about their confidence in their ability to quit (self-efficacy), including why they can or cannot quit	<p><b>4007:</b> Quitting smoking now greatly reduce the greatest risk to your health &lt;inaudible&gt;. Well, Michael should be proud of his self and I would like to quit one day.  <b>ELM:</b> Yeah, what did you think about how he went about quitting like setting his quit date and getting rid of his cigarettes?  <b>4007:</b> Yeah, that's how they say you're supposed to do it. I did-- that's how I did it, set a quit date and didn't have no more cigarettes, got rid of all the lighters and put all the ashtrays-- gave all the ashtrays to my friend and all that stuff. It works, it works like that, doing it that way. I think my biggest problem is because I got somebody else that smoke in my house and that's always smoking in my presence. And then when we tried to do it together it was like she wasn't really motivated so she just was kind of trying to do it for me and you can't do stuff for other people you have to really want to do it for yourself.  <b>ELM:</b> Yeah. So what do you think would help you then?  <b>4007:</b> I don't know. But I was doing really good at one point when I was in the smoking cessation program and then like I said, I mean I get stressed out and when I get upset-- when I get upset I-- like frustrated or mad or something like that then I want a cigarette because it calms me down and I need another stress reliever or something else to calm me down.  [Double coded with LabelSE, Emotional, and Aspiration]</p>
LabelSE	Their thoughts	<b>ELM:</b> What did you think about the part here

	<p>on the self-efficacy messages on the labels, Including how helpful and feasible it is</p>	<p>where it says, "Ask your friends and family for support to help you quit."  <b>4007:</b> Well, I mean they always say that, yeah. So-- except if you got-- well no, I'm not going to say that. Even if you have friends and family that smoke, they still want to help you quit.  <b>ELM:</b> Yeah, you have friends and family like that?  <b>4007:</b> They're still supportive, yeah.  <b>ELM:</b> Is that something that's a helpful message for people who want to quit or not so much?  <b>4007:</b> Not really, because it's got to be something that you want to do.  <b>ELM:</b> Is that something that you have-- you have family and friends who've been trying to get you to quit like you were saying before?  <b>4007:</b> I mean, I don't have people in my life that particularly bother me about it but when I try to quit, I have a lot of support. I've tried to quit about four times in the past six months.  <b>ELM:</b> Wow. Yeah, that's a lot. What do they usually do for support?  <b>4007:</b> Just if I get a craving they'll talk to me just like sort of cheering me on and the person that I live with smokes and so she quit with me one time so I wouldn't have that extra temptation.  ...  <b>ELM:</b> Is that kind of stuff helpful, you think or not so much?  ...  <b>4007:</b> Yeah, yeah it's helpful.  [Double coded with Quitmotiv]  .....  <b>ELM:</b> Okay. What did you think about the part here about delay smoking your first cigarette to help you quit?  <b>4047:</b> Well, how do you delay your first cigarette? You have a craving. When you have a cigarette in your possession and you delay it-- I mean when you say delay, what do you mean? Hold off, don't smoke it right away. You smoke it later. Doesn't catch me you know. Not to have the cigarette period, like I say once again, in your possession and totally absence is the only way you can kind of get away from it. And I know me</p>
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		<p>from not smoking, I can take a cigarette and put it upstairs, and hide it under the mattress, and put books behind it. And then when I want a cigarette and my cravings go on, my memory comes on and goes right to the spot I hid it at. And I'm smoking it. Now, if I didn't have it in there, I could go to all those spots I want. But if the weather's not conditioning me to go out to get it, I might not have it. But if I have it there and I call myself delaying the smoking, it's not going to work for me.</p> <p>.....</p> <p><b>ELM:</b> What did you think about this text here, how it says, "She was diagnosed with it, and then, after her diagnosis, she quit by staying busy when she felt an urge to smoke"? What did you think about that text there?</p> <p><b>4048:</b> I guess if you knew you was going to get emphysema from it, you should've stopped before you got lung disease.</p> <p><b>ELM:</b> Is that a useful strategy, do you think? If people want to quit, do you think staying busy is something that could help, or not really?</p> <p><b>4048:</b> Yeah, staying busy. Going to maybe some meetings or something, being around people that don't smoke. &lt;clears throat&gt;</p> <p>...</p> <p><b>ELM:</b> I'm just curious if you think staying busy might help you.</p> <p><b>4048:</b> Yeah, staying busy might. Keep your mind off it.</p> <p>[Double coded with QuitmotivLabel]</p>
QuitSELLabel	The impact of the labels on their confidence to quit, including which labels made them feel more able to quit.	<p><b>ELM:</b> Okay. Yeah, you noticed that part about Lena's diagnosis more. Okay. So do-- I know when we talked about that other label, number 10, with that guy who was kind of like posing with his shirt open how maybe you'd relate better to a woman, maybe not. I was just curious if you still felt like that now that you see this one where there's a woman on it. I don't know if that makes any difference to you or not.</p> <p><b>4007:</b> Did I like this quit thing better?</p> <p><b>ELM:</b> Yeah.</p> <p><b>4007:</b> Yeah, I do like her better. I think her story is more inspirational anyway to me.</p>

	<p><b>ELM:</b> Why is that because she was-- quit after her diagnosis &lt;inaudible&gt;?</p> <p>...</p> <p><b>4007:</b> I think because it was like she overcame her-- she had an obstacle to overcome. He just set a quit date and boom. [Double coded with Aspiration, Character, and QuitmotivLabel]</p> <p>.....</p> <p><b>ELM:</b> Yeah. We talked about motivating, but were there any that made you feel like "Yeah, I'm confident. I'm sure I could quit if I wanted to"?</p> <p><b>4007:</b> My buddy [label #9]... Yeah. I know I can quit if I want to.</p> <p><b>ELM:</b> What was it about him? The same reasons as before?</p> <p><b>4007:</b> Yeah, and, I mean, like I said, I know I can quit if I want to, but it's like, yeah, looking at him I'm like "If he can do it, I know I could do it." [Double coded with Aspiration and QuitSE]</p> <p>.....</p> <p><b>ELM:</b> Mm-hmm. So, we talked about which ones might motivate you to quit. Are there any that when you saw them they made you feel more confident that quitting is something you could do if you wanted to, you know, like increase your confidence at all?</p> <p><b>4047:</b> Well, no.</p> <p>.....</p> <p><b>ELM:</b> This part here, when you were talking about him setting his quit date and getting rid of his cigarettes, what did you think about that part?</p> <p><b>4048:</b> That's a good thing. Throw away all the cigarettes. And then he had a quitting date, so he made up in his mind that he wanted to quit, and he done it, and he stuck to it.</p> <p><b>ELM:</b> Do you think that's a strategy that could help other smokers, if they wanted to quit?</p> <p><b>4048:</b> Yeah. Mark your calendar. "This is the last cigarette that I'm going to smoke." And then, after that, don't buy no more. Throw all of them away. Throw your ashtrays away if you have to. &lt;laughs&gt;</p> <p>...</p> <p><b>ELM:</b> Is that something you think would help you to quit if you ever wanted to?</p>
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		<p><b>4048:</b> Yeah... I think I can mark the calendar and set a date.  [Double coded with LabelSE and Character]</p>
LabelRE	<p>Their thoughts on the response efficacy messages on the labels</p>	<p><b>ELM:</b> And what did you think about the part where it says, "Join the thousands who've quit using the quit line" which is that quit now number.  <b>4007:</b> I know a lot of people do use that number and quit. It's like a-- it's like the national-- it's the national quit line. It's the national hotline for people who want to quit smoking.  <b>ELM:</b> Is it believable that that many people, that thousands of people have done it?  <b>4007:</b> Yeah.  [Double coded with Credibility and Qline]  .....  <b>ELM:</b> So you said numbers 11, 12 and four. Can you tell me why you chose those three [as most motivating to call the Quitline]?  <b>4007:</b> You are more likely to quit when you talk to an expert for free because that tells you you more likely to quit when you talk to an expert. And when you're trying to quit you want your best chances, and this tells you right here you up your chances when you talk to an expert, so that probably would help. You're not just quitting for yourself. You have the power to quit. That's like a positive affirmation, "You have the power to quit," that they're telling you so. People need to hear stuff like that. They probably would be more apt to call from hearing that positivity going in their mind. And "Join the thousands who quit using the Quitline," so that's proving that it's worked for thousands of people, using the Quitline, so...  [Double coded with LabelSE and QlineLabel]  .....  <b>ELM:</b> What did you think about the text here that says, "Quit smoking now to lower your children's risk of getting lung disease"?  <b>4047:</b> Well, that doesn't really move me. I think how to quit to help prevent your child's risk would be more of something I personally need because just to quit is not as easy as it can be written in that form. But I think if they identify it</p>

		<p>in a better way of how to make it happen to enhance your child's life, it would be more important. So I think a lot of things, the way you have it written, what really catches the eye that could be helpful than just to write something that say, "Well, this could be harmful," and add more meaning to it, you know?  [Double coded with QuitmotivLabel]  .....  <b>ELM:</b> Why do you think it would be helpful-- in what way?  <b>4048:</b> Because by him being so young, he advertising that young people can do it, too, not only older people. And look how healthy he looks. You can look healthy, too, and you could stop from the risk of cancer and heart attacks. It improves your health.  [Double coded with Aspiration, Character, QuitmotivLabel]</p>
Qline	Discussions about how motivated or unmotivated they are to call the quitline and why, including perceived effectiveness of the quitline	<p><b>ELM:</b> Okay. Was there any other new information to you on this label?  <b>4007:</b> No. I know about this number.  ...  <b>ELM:</b> What have you heard about it before?  <b>4007:</b> Well you can call this number and they'll help you quit.  <b>ELM:</b> Okay. Do you know anyone who's done that, who's called that number?  <b>4007:</b> Yeah, me...But it didn't work.  <b>ELM:</b> Yeah what did-- yeah so, did it help you quit for a couple days or it didn't really work at all?  <b>4007:</b> Well, it helped me quit for like five days.  <b>ELM:</b> Yeah, but then you kind of went back?  <b>4007:</b> Yeah. I smoke when I get upset. I got to find a different stress reliever.  .....  <b>ELM:</b> Do you think talking to an expert is something that would be helpful to you if you decided to quit altogether?  <b>4047:</b> I don't know. But I guess if I talked to someone that's been through what I'm going through and shared some of their moments with me, it might touch me a little more than what I've been being touched. It's something I'd be willing</p>

		<p>to try.  [Double coded with QlineLabel and LabelRE]  .....  <b>ELM:</b> What about the part here about, "Join the thousands who quit using the Quitline"? What did you think about that part?  <b>4048:</b> That somebody can help you if you call the number.  <b>ELM:</b> Is that a believable message?  <b>4048:</b> Yes. "If you feel like smoking a cigarette, pick up the line, and we'll help you."  <b>ELM:</b> Does that surprise you, that thousands of people have quit using the Quitline?  <b>4048:</b> No. No. Anything to help you... I mean, if you want help. You got to want the help to get it.  <b>ELM:</b> So it only works if you really want it to?  <b>4048:</b> If you want it. Right.  [Double coded with LabelRE and QlineLabel]</p>
QlineLabel	The impact of the labels on their perceptions of the quitline and their motivation to call the quitline	<p><b>ELM:</b> Was there any new information to you on this label?  <b>4007:</b> Yeah, it says, "You're more likely to quit when you talk to an expert." I didn't know that.  <b>ELM:</b> What was your experience like when you called that quit now number? Did you feel like you were talking to an expert or how was that for you?  <b>4007:</b> I just called for patches so I didn't follow up on the-- everything that they said to do because they want you to call them if you get a craving or if you feel like you need added support and then you're supposed to call after you get a week clean. Well, I didn't get a week but at certain times like your first 24 hours you're supposed to call just to check in and I didn't follow through. So I didn't know how helpful that-- they're saying it's more likely that you will quit, I guess, when you follow through with it.  [Double coded with LabelRE, Qline and Newness]  .....  <b>ELM:</b> Okay. Are there any labels that would motivate you to call the quit line?  <b>4047:</b> Well, out of the ones I was saying, with the foot. And all the ones that I was showing you was enough to make me call the helpline. [labels 1, 2,</p>

		<p>4, 5, 7, and 8].</p> <p>.....</p> <p><b>ELM:</b> Are there any labels in particular that would motivate you to call the Quitline?</p> <p>...</p> <p><b>4048:</b> Yeah. What one was that “Quit”-- oh, right. One of these, I think, was that they called it.</p> <p><b>ELM:</b> Number twelve, the one with the couple?</p> <p><b>4048:</b> And it says that they called-- “joined the thousands who quit us [sic] the Quit hotline.”</p> <p><b>ELM:</b> Because they did it and they were able to quit?</p> <p><b>4048:</b> Yeah.</p> <p><b>ELM:</b> Any other labels? And you can say no if that’s true.</p> <p><b>4048:</b> Well, that look like the only one that somebody actually called, so that would be it. That would motivate me to call.</p> <p><b>ELM:</b> Yeah, to know that someone else did it?</p> <p><b>4048:</b> Yeah. Right... She called, so I should call. [Double coded with Aspiration]</p>
QuitRE	Discussions about the effectiveness of quitting on improving health (response efficacy)	<p><b>ELM:</b> Anything else come to mind as you look at the label?</p> <p><b>4007:</b> No, not really just-- that's just what I was talking about. A younger guy-- I mean we already know quitting improves your health and all that, but he's standing for another group of people, and I guarantee you a higher amount of people will be able to relate to him. [Double coded with Similarity, Credibility, and LabelRE]</p>
QuitRELabel	The impact of the labels on their perceptions of the effectiveness of quitting on improving health	<p><b>ELM:</b> Was there any new information to you on this label?</p> <p><b>4007:</b> Yeah, I didn't know as soon as you quit your heart attack and cancer risk drop.</p> <p><b>ELM:</b> What did you think about that?</p> <p><b>4007:</b> Well, that's fantastic.</p> <p><b>ELM:</b> Does that make sense that it would drop as soon as you quit?</p> <p><b>4007:</b> I guess, yeah.</p> <p><b>ELM:</b> But maybe not as much?</p> <p><b>4007:</b> I mean, I didn't think as soon as you quit. I thought it might take some time because you done damaged your body so much. [Double coded with Credibility, Emotional, and</p>

		<p>LabelRE]  .....  <b>ELM:</b> What's the first thing you noticed about that label?  <b>4048:</b> Your family members will help you quit. You'll live longer, to see your children grow, and everybody in the family will be happy. And you're not just quitting for yourself, you quitting for your family members so that they can enjoy your life longer, and you can enjoy your life longer. And children-- watch your children grow up. And live longer.  [Double coded with QuitmotivLabel]</p>
<b>CHARACTERS ON LABELS</b>		
<p>Aspiration</p>	<p>Any feelings about wanting to be more like (or not like) a character or in a character's situation, such as wanting to quit like the character did, wanting to look healthy like a character, or wanting to be unhealthy like a character. Does not apply to labels 2, 3, 5, and 7 because they do not show characters.</p>	<p><b>ELM:</b> Okay. Next we'll talk about label number 12.  <b>4007:</b> Well, I kind of talked about this one when we talked about the children. Being as I don't have no kids, I was saying quit to live longer for my loved ones so I can relate to this one a lot.  <b>ELM:</b> Because what you said before about your nieces and your niece's daughter?  <b>4007:</b> Yeah, wanting to be around to be in their lives and not catching any diseases and-- that's going to shorten my life.  [Double coded with Relevance]  .....  <b>4048:</b> I wouldn't want to be like this one. I mean, I would want to be like these. But...  <b>ELM:</b> You wouldn't want to be like that woman crying, in number six?  <b>4048:</b> Yeah.  .....  <b>ELM:</b> Let's see. I'll read them out for the recording. You said numbers ten... nine... eleven... twelve... and six. Can you tell me about why you picked out these ones?  <b>4048:</b> This is giving me a message... that quitting smoking will improve my health. This is giving me the same message-- quitting will improve my health. This is giving me a message it will improve children health around you. This is giving me a message: Use the hotline. And then this one, lung disease-- she looks sad, so I wouldn't want to look like that. That's giving me another message-- sad and confused and by</p>

		<p>herself and lonely.</p> <p><b>ELM:</b> Is there something about those people that you kind of see yourself in them in some way?</p> <p><b>4048:</b> Well, a little way... I want to look healthy... I don't want to look sad, like her. I don't want a disease.</p> <p>[Double coded with Similarity and Dissimilarity]</p>
Character	General discussions of the character, including traits, appearance, etc.	<p><b>ELM:</b> What did you think about the picture of that guy? What do you think about him?</p> <p><b>4007:</b> Nothing, he looks ridiculous.</p> <p><b>ELM:</b> Yeah because of what he-- how he's posed or--</p> <p><b>4007:</b> Yeah. They should have just gave him the t-shirt to wear all by itself.</p> <p><b>ELM:</b> How did this label make you feel if anything?</p> <p><b>4007:</b> Nothing. He's cool.</p> <p>.....</p> <p><b>ELM:</b> Any other things come to mind?</p> <p><b>4047:</b> Well, he loves his girlfriend. He's kissing her neck. That's it.</p> <p><b>ELM:</b> What's the main message you think this one's trying to get across?</p> <p><b>4047:</b> &lt;inaudible&gt; he love her.</p> <p><b>ELM:</b> The message is that he loves her?</p> <p><b>4047:</b> Yeah, there's nothing to do with smoking.</p> <p>.....</p> <p><b>ELM:</b> Did it make you think about your own family or friends at all?</p> <p><b>4048:</b> Yes. Yes-- black people. Yes.</p> <p><b>ELM:</b> Can you tell me more about that? What family were you thinking about?</p> <p><b>4048:</b> My family. That could be my grandfather or my grandmother or my aunt or my uncle, my mother. She smiling, she happy, and she feel good... feel healthy and strong.</p> <p>[Double coded with Emotional, Relevance and Similarity]</p>
Similarity	Discussions of perceived similarity to the characters, including which labels showed a	<p><b>ELM:</b> Were there any pictures of people who you thought were most like you in some way, like kind of similar to you or that you could relate to in some way?</p> <p><b>4007:</b> These.</p> <p><b>ELM:</b> So you said numbers nine, eight, one and six. Why did you pick those four?</p>

	<p>character they felt was like them in some way</p>	<p><b>4007:</b> Well, I picked number six because she's upset. Don't have nothing to do with the message, but she's upset, and when I get upset I smoke cigarettes, so that's why I picked that one. I picked number one because she's a woman, and she overcame a hurdle in her life, and that is me in a lot of ways, so I can relate to her. And she's only three years older than me. I picked number eight because I've seen people in this situation, so I can relate to this whole scenario right here. And I picked number nine because even though he's younger than me he's very believable.</p> <p>.....</p> <p><b>ELM:</b> Are there any people who to you they seemed like they were like you in some way? Any people who seem similar to you?</p> <p><b>4047:</b> Well, I guess the guys in the hospital bed.</p> <p>...</p> <p><b>ELM:</b> Okay. What is it about number eight?</p> <p><b>4047:</b> Well, he's going through some conditions that I'm going through right now. I'm just not in the hospital at this particular time. So, I've been-- I researched on stop smoking. So, if I don't stop finally, I will be in maybe his next phase of being seen by the hospital. So, that's why I say that one.</p> <p>[Double coded with Susceptibility]</p> <p>.....</p> <p><b>ELM:</b> Could you pick out for me the labels that show people who seem most like you, most similar to you, in some way?...You said numbers ten... nine... eleven... twelve... and six. Can you tell me about why you picked out these ones?</p> <p><b>4048:</b> This is giving me a message... that quitting smoking will improve my health. This is giving me the same message-- quitting will improve my health. This is giving me a message it will improve children health around you. This is giving me a message: Use the hotline. And then this one, lung disease-- she looks sad, so I wouldn't want to look like that. That's giving me another message-- sad and confused and by herself and lonely.</p> <p><b>ELM:</b> Is there something about those people that you kind of see yourself in them in some way?</p> <p><b>4048:</b> Well, a little way... I want to look healthy... I don't want to look sad, like her. I</p>
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		<p>don't want a disease. [Double coded with Aspiration]</p>
Dissimilarity	Discussions of perceived dissimilarity to the characters	<p><b>ELM:</b> Does it remind you at all about your family?  <b>4007:</b> Not really. We don't have that many people in my family. But the text part, "You're not just quitting for yourself" like I said, I have nieces and nephews, young. My niece just had a baby, a baby girl. She's like two weeks old so I would-- I don't want to have heart disease or lung cancer and not be able to be around to watch her grow up and then I don't want to be smoking even-- like I said, I don't smoke around them but I just want to be able to be around for them also be a good role model for them and not-- because already one of my nephews is smoking. He smokes, my oldest nephew. He's 21, he smokes.  [Double coded with Aspiration, LabelSE, QuitmotivLabel, and Similarity]  .....  <b>ELM:</b> What's the main message you think this one's trying to get across?  <b>4047:</b> Well, it's definitely showing you that smoking can do these things to you. But some things I think is more powerful in showing you what could be helpful and what could not be. And then this might blow smoke out of their throat, and they've already taken in their destruction as way beyond something I would want to do. Either save somebody's life, or take somebody's life. I don't think that's the problem.  [Double coded with Susceptibility]  .....  <b>ELM:</b> Can you tell me why you didn't pick these other labels? [for perceived similarity]  <b>4048:</b> Because they look sickly... and I'm not sick, and don't want to be sick.  [Double coded with Aspiration]</p>
SimilarChange	What changes they would make to the characters to make the characters seem more like	<p><b>ELM:</b> Yeah. Would it be better to have a different kind of person like older person or a younger person or male or female or--  <b>4007:</b> Different people. Different people, that's why I said different people because some-it'll always be somebody that somebody can relate to because there's going to be somebody that can</p>



	<p>them</p>	<p>relate to Michael but it's just not me.  <b>ELM:</b> What is it about him that you don't feel like you can relate to?  <b>4007:</b> He just looks cheesy. I probably could relate more to a woman.  [Double coded with Dissimilarity]  .....  <b>ELM:</b> What about his-- so you said maybe you could relate more to a woman. What about his age, is that-- are you similar to that age or are you-- I'm sorry, I'm not sure how old you are.  <b>4007:</b> I'm 39.  <b>ELM:</b> Okay. Is that also-- can you relate better, do you feel like, to people who are a similar age to you or that doesn't really matter?  <b>4007:</b> Yeah, similar age to me. But it really doesn't matter because-- I mean I wouldn't want nobody older but I would be like-- if it was somebody younger I would be like, "Wow. If they could quit and they so young, I know I should be able to." But older, I wouldn't want it to be older because I would be like, "Well, I don't want to wait until I get that age to quit."  [Double coded with Dissimilarity and Similarity]</p>
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Zhao, X., Nan, X., Yang, B., & Iles, I. A. (2014). Cigarette warning labels: Graphics, framing, and identity. *Health Education, 114*(2), 101-117. doi: 10.1108/HE-06-2013-0024

## CURRICULUM VITAE

**Erin L. Mead, MHS**

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### PERSONAL INFORMATION

Date of birth: January 14, 1983  
Place of birth: Baltimore, Maryland, U.S.

### EDUCATION & TRAINING

- 2014            **Doctor of Philosophy (PhD)**, ABD, Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD (*Final defense date: August 22, 2014*)
- 2011            **Summer Immersion Program in Health Disparities Research**, University of Michigan, Michigan Institute for Clinical and Health Research, Ann Arbor, MI
- 2009            **Master's of Health Science (MHS)**, Department of International Health – Social & Behavioral Interventions, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
- 2005            **Bachelor's of Arts (BA)**, Anthropology and Archaeology, Dickinson College, Carlisle, PA

### HONORS AND AWARDS

#### Honors

- 2012 – present    Hopkins Sommer Scholar, Johns Hopkins University, Bloomberg School of Public Health
- 2010 – 2012      Cancer Epidemiology, Prevention, and Control T32 Predoctoral Training Grant Program, National Cancer Institute
- 2009            Delta Omega Honorary Society in Public Health, Johns Hopkins University, Bloomberg School of Public Health
- 2005            Honors in Anthropology, Dickinson College
- 2001 – 2005      Phi Beta Kappa academic honor society, Omicron Delta Kappa leadership honor society, Eta Sigma Phi classical studies honor society, and Alpha Lambda Delta honor society, Dickinson College  
John Dickinson scholar, Dickinson College  
Dean's list (all semesters), Dickinson College



## Awards

- 2014 Distinguished Doctoral Research Award, Johns Hopkins University, Bloomberg School of Public Health, Department of Health, Behavior and Society
- 2012 – present Hopkins Sommer Scholar, Johns Hopkins University, Bloomberg School of Public Health
- 2010 – 2012 Cancer Epidemiology, Prevention, and Control T32 Predoctoral Training Grant Program, National Cancer Institute
- 2009 Global Field Experience Fund travel award, Johns Hopkins University, Bloomberg School of Public Health

## PUBLICATIONS

### Journal Articles (peer reviewed):

1. **Mead EL**, Cernigliaro D, Lilleston PS, Sherman SG. Addressing condom use in pornography: Need for a socioecological perspective. *Sexually Transmitted Diseases*. Under review.
2. **Mead EL**, Rimal R, Ferrence R, Cohen JE. Understanding the sources of normative influence on behavior: The example of tobacco. *Social Science & Medicine*. 2014; 115:139-143.
3. **Mead EL**, Doorenbos AZ, Javid SH, Haozous EA, Alvord LA, Flum DR, Morris AM. Shared decision-making for cancer care among racial and ethnic minorities: A systematic review. *American Journal of Public Health*. 2013; 103(12):e15-29.
4. **Mead EL**, Gittelsohn J, Roache C, Corriveau A, Sharma S. A community-based, environmental chronic disease prevention intervention to improve healthy eating psychosocial factors and behaviors in indigenous populations in the Canadian Arctic. *Health Education and Behavior*. 2013; 40(5):592-602.
5. **Mead E**, Roser-Renouf C, Rimal RN, Flora JA, Maibach EW, Leiserowitz A. Information seeking about global climate change among adolescents: The role of risk perceptions, efficacy beliefs, and parental influences. *Atlantic Journal of Communication*. 2012; 20(1): 31-52.
6. Surkan P, Coutinho A, Christiansen K, Dennisuk L, Suratkar S, **Mead E**, Sharma S, Gittelsohn J. Healthy food purchasing among African American youth, associations with child gender, adult caregiver characteristics and the home food environment. *Public Health Nutrition*. 2011; 14(4):670-7.
7. **Mead E**, Gittelsohn J, Kratzmann M, Roache C, Sharma S. Impact of the changing food environment on dietary practices of an Inuit population in Arctic Canada. *Journal of Human Nutrition and Dietetics*. 2010; 23 (Suppl 1): S18-26.
8. Hopping BN, **Mead E**, Erber E, Sheehy T, Roache C, Sharma S. Dietary adequacy of Inuit in the Canadian Arctic. *Journal of Human Nutrition and Dietetics*. 2010; 23 (Suppl 1): S27-34.

9. Hopping BN, Erber E, **Mead E**, Sheehy T, Roache C, Sharma S. Socioeconomic indicators and frequency of traditional food, junk food, and fruit and vegetable consumption amongst Inuit adults in the Canadian Arctic. *Journal of Human Nutrition and Dietetics*. 2010; 23 (Suppl 1): S51-58.
10. **Mead E**, Gittelsohn J, Roache C, Sharma S. Healthy food intentions and higher socioeconomic status are associated with healthier food choices in an Inuit population. *Journal of Human Nutrition and Dietetics*. 2010; 23 (Suppl 1): S83-91.
11. **Mead E**, Gittelsohn J, De Roose E, Sharma S. Important psychosocial factors to target in nutrition interventions to improve diet in Inuvialuit communities in the Canadian Arctic. *Journal of Human Nutrition and Dietetics*. 2010; 23 (Suppl 1): S92-99.
12. Hopping BN, Erber E, **Mead E**, Roache C, Sharma S. High levels of physical activity and obesity co-exist amongst Inuit adults in Arctic Canada. *Journal of Human Nutrition and Dietetics*. 2010; 23 (Suppl 1): S110-114.
13. Pakseresht M, **Mead E**, Gittelsohn J, Roache C, Sharma S. Awareness of chronic disease diagnosis amongst family members is associated with healthy dietary knowledge but not behaviour amongst Inuit in Arctic Canada. *Journal of Human Nutrition and Dietetics*. 2010; 23 (Suppl 1): S100-109.

**Book Chapters:**

1. **Mead EL**, Rimal RN. (June 2014) RISP (Risk Information Seeking and Processing). In *Encyclopedia of Health Communication*. SAGE Publications, Inc.

**Government Reports:**

1. Sharma S, **Mead E**, Gittelsohn J, Beck L, Roache C. The Healthy Foods North nutrition and lifestyle intervention program: a community- and evidence-based intervention trial among Inuit and Inuvialuit in Arctic Canada. Institute of Population and Public Health, Canadian Institutes of Health Research. *Population Health Intervention Research Casebook, 2011*. 2011: 36-40.

**TEACHING**

**Guest Lecturer**, Johns Hopkins University, Bloomberg School of Public Health  
4<sup>th</sup> Term 2012-13, 1<sup>st</sup> Term 2013-14; Winter Institute 2014

Lecture: “Developing a Health Behavior Program from Theory to Practice: The Healthy Foods North Example”

Course: Program Planning for Health Behavior Change

Instructors: Drs. Andrea Gielen, Vanya Jones, Samantha Illangasekara

**Lead Teaching Assistant**, Johns Hopkins University, Bloomberg School of Public Health

1<sup>st</sup> Term 2012-13, 2013-14

Course: Program Planning for Health Behavior Change

Instructors: Drs. Andrea Gielen and Vanya Jones

**Teaching Assistant**, Johns Hopkins University, School of Nursing  
1<sup>st</sup> Term 2012-13

Course: Analytic Approaches to Outcomes Management: Individuals and Populations  
Instructor: Dr. Erika Avila Tang

**Teaching Assistant**, Johns Hopkins University, Bloomberg School of Public Health  
1<sup>st</sup> Term 2012-13

Course: Epidemiology of Tobacco Control  
Instructor: Dr. Erika Avila Tang

**Teaching Assistant**, Johns Hopkins University, Bloomberg School of Public Health  
Summer Term 2012-13

Course: Social and Behavioral Aspects of Public Health  
Instructor: Dr. David Jernigan

**Teaching Assistant**, Johns Hopkins University, Bloomberg School of Public Health  
1<sup>st</sup> Term 2011-12; 4<sup>th</sup> Term 2011-12, 2012-13

Course: Program Planning for Health Behavior Change  
Instructors: Drs. Andrea Gielen, Vanya Jones, Samantha Illangasekara

**Teaching Assistant**, Johns Hopkins University, Bloomberg School of Public Health  
Winter Term 2011; 2<sup>nd</sup> Term 2011-12

Course: Introduction to Persuasive Communications: Theories and Practice  
Instructor: Dr. Rajiv Rimal

**Teaching Assistant**, Johns Hopkins University, Bloomberg School of Public Health  
3<sup>rd</sup> Term 2010-11

Course: Health Literacy: Challenges and Strategies for Effective Communication  
Instructor: Dr. Debra Roter

## **PROFESSIONAL EXPERIENCE**

**Research Assistant**, Johns Hopkins University, Bloomberg School of Public Health,  
Baltimore, MD

December 2012 – present

- Contributing to the design of a study to examine the tobacco use in low-income African Americans in Baltimore City
- Developing survey instruments on tobacco-related knowledge, attitudes, beliefs, and behaviors
- Collecting and analyzing qualitative data
- Analyzing quantitative survey and experimental data

**Research Assistant**, Johns Hopkins University, Bloomberg School of Public Health,  
Baltimore, MD

November 2011 – May 2014

- Conducting a literature review on social exposure to smoking in the environment and impact on tobacco use behaviors.
- Writing a manuscript on the literature review for submission to a peer-reviewed journal.

**Research Assistant**, Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD

November 2012 – March 2013

- Contributing to the design and coordination of a study to evaluate the implementation of tobacco control policy in five states in India
- Developing instruments and training staff to collect data on tobacco control policy implementation

**Research Associate I**, Summer Immersion Program in Health Disparities Research, University of Michigan, Ann Arbor, MI

June – August 2011

- Conducted systematic literature review on shared decision-making in cancer treatments among racial/ethnic minority populations using Pubmed, PsycInfo, CINAHL, and EMBASE electronic publication databases.
- Prepared a manuscript on the systematic literature review results for submission to a refereed journal.
- Attended seminars on topics related to health disparities research, including study methods, data analysis, critical concepts in health disparities, and translational research.

**Research Assistant**, Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD

October 2010 – May 2011

- Conducted quantitative data analysis on the associations of risk perceptions and attitudes on intentions and information seeking behaviors to engage in sustainable behaviors related to climate change among parent-child dyads in the US
- Collaborated on preparation of manuscripts for submission to refereed journals.

**Consultant**, University of Alberta – Edmonton, Division of Endocrinology & Metabolism, Edmonton, AB, Canada

July 2010 – February 2011

- Wrote, submitted and managed manuscripts for publication in peer-reviewed journals and government reports
- Assisted with grant transfers and Research Ethics Board applications
- Assisted in the preparation and submission of Dr. Sharma's application for a faculty award and preparation of letters of recommendations for staff.

**Project Manager**, University of North Carolina at Chapel Hill, Gillings School of Public Health, Kannapolis, NC

September 2009 – July 2010

- Managed 11 international research studies and coordinated grant submissions in dietary assessment and nutritional & lifestyle intervention programs for multi-ethnic and indigenous populations in Canada, the U.S., and Barbados
- Led and conducted quantitative data analysis on the associations between diet-related psychosocial factors and behaviors and qualitative data analysis of in-depth interviews on the food environment and factors influencing dietary behaviors among Inuit/Inuvialuit in Canada
- Supervised 20 staff members, oversaw the recruitment, hiring, and training of new staff members, and trained collaborators on administration of quantitative food frequency questionnaires and 24-hour dietary recalls
- Coordinated the submission and finalization of 15 papers for a supplement with the *Journal of Human Nutrition and Dietetics* in volume 23, supplemental issue 1.

**Research Assistant**, University of North Carolina at Chapel Hill, Gillings School of Public Health, Kannapolis, NC

January – August 2009

- Assisted in the management and coordination of international dietary assessment and nutritional & lifestyle intervention research studies for multi-ethnic and indigenous populations in Canada and the US.
- Collected quantitative food frequency questionnaires, 24-hour recalls, height and weight measurements, and food insecurity data on Alaskan Natives in 6 remote communities in the Yukon-Kuskokwim Delta and Norton Sound Delta regions of Alaska
- Coordinated the submission of 15 abstracts and presentations for ICCH and manuscript development by 11 colleagues

**Program Coordinator**, Healthy Foods North study, Government of Nunavut, Department of Health and Human Services, Cambridge Bay and Taloyoak, Nunavut, Canada

June – December 2008

- Managed the Healthy Foods North (HFN) program in Nunavut, a nutritional and lifestyle intervention program aimed at Inuit adults to reduce risk of chronic disease in two remote communities in the Canadian Arctic
- Administered about 380 24-hour dietary recalls, quantitative food frequency questionnaires, dietary behavior surveys, physical activity surveys, and height and weight measurements with approximately 100 Inuit participants, and collected monthly data on food prices in the community food stores, in two remote communities in the Canadian Arctic as part of the HFN data collection
- Hired, trained, and managed six local community members as health promotion workers for the HFN program
- Conducted and arranged over 20 in-store interactive activities (e.g., taste tests, cooking demonstrations) and over 12 worksite interactive activities (e.g., coffee

station makeovers, pedometer challenges) and community-wide events (e.g., community dance) to educate community members about nutrition and to promote healthy eating, healthy food preparation methods, and physical activity

**Interventionist**, Baltimore Healthy Eating Zones study, Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD  
November 2007 – March 2008

- Baltimore Healthy Eating Zones was an intervention that aimed to improve nutrition and reduce obesity among Baltimore African-American adolescents
- Developed and piloted survey instrument to assess impact of nutritional intervention on psychosocial factors (food-related knowledge, outcome expectations, self-efficacy, intentions) and food purchasing behavior in African-American adolescents aged 10 – 14 years
- Conducted 10 in-depth interviews with adolescent and adult study participants about diet and nutrition, and administered and collected over 20 surveys

**Research Subjects Specialist**, Johns Hopkins University, School of Medicine, Office of Human Subjects Research, Institutional Review Boards (IRB), Baltimore, MD  
August 2005 – June 2007

- Achieved expertise in federal regulations (CFR 21 and CFR 45, HIPAA) related to human subjects research and their application
- Gained practical knowledge of research administration and the IRB approval process
- Recorded minutes at convened meetings of IRB committees, corresponded with Principal Investigators (PIs) of research studies concerning committee meeting outcomes, and trained other IRB staff on processing of applications for exemption

### **PROFESSIONAL MEMBERSHIPS**

2012 – present	Academy Health
2011 – present	American Association for Cancer Research
2010 – present	American Society for Nutrition
2009 – present	American Public Health Association
2009 – present	Global Health Council

### **SERVICE**

#### **Journal Reviewer**

2014	World Medical and Health Policy
2013	Health Promotion International
2013	Health Education and Behavior

2012 Journal of Human Nutrition and Dietetics

2011 Asian Journal of Communication (contributed to a review)

**Conference Session Moderator**

2013 American Public Health Association Session: “Research on the Global Tobacco Epidemic”

**Conference Abstract Reviewer**

2012 – 2014 American Public Health Association

**Academic Service**

**Johns Hopkins University, Bloomberg School of Public Health**

2012 Member of Health Disparities Panel, Department of Health, Behavior and Society Intersections Seminar

2011 – 2014 President & Member, Green Student Group

2011 – 2013 Member, Mixed Methods Interest Group

2011 – 2012 Co-Chair, Health, Behavior and Society Student Organization

2011 – 2012 Coordinator, Cancer Epidemiology, Prevention, and Control T32 Predoctoral Training Grant Program pre-doctoral student lunch session

**PRESENTATIONS**

**Scientific Meetings:**

*\*Meetings at which I presented*

1. Rimal RN, Turner MM, Lumby E, **Mead EL**, Cohen J, Shah V, Feighery E. “Implementation of the Cigarettes and Other Tobacco Products Act (COTPA) in India: A Two-Year Assessment in Five States.” Presentation at the Evaluation for an Equitable Society Biennial Conference in Dublin, Ireland. October 2014.
2. **Mead E\***, Rimal RN, Cohen J, Feighery E, Chatterjee N. “Accessibility of tobacco by youth in India: An observational study of compliance with the Cigarettes and Other Tobacco Products Act (COTPA).” Poster Presentation at the American Public Health Association Annual Meeting and Exposition in Boston, MA. November 2013.
3. Rimal RN, **Mead E**, Cohen J, Feighery E, Yang J. “Implementation of the Cigarettes and Other Tobacco Products Act (COTPA) in India: City population size as a predictor of compliance.” Poster Presentation at the American Public Health Association Annual Meeting and Exposition in Boston, MA. November 2013.

4. Cernigliaro D, Lilleston P, **Mead E**, Sherman SG. "Protecting the health of adult film performers: Industry perspectives on the safer sex in the adult film industry act (Measure B)." Poster Presentation at the American Public Health Association Annual Meeting and Exposition in Boston, MA. November 2013.
5. Lilleston P, **Mead E**, Cernigliaro D, Sherman SG. "Sexual health in the Adult Film Industry (AFI): Environmental Barriers and Facilitators of Sexually Transmitted Infection (STI) Transmission." Poster Presentation at the STI & AIDS World Congress. July 2013.
6. **Mead EL\***, Doorenbos AZ, Flum DR, Morris AM. "Racial and ethnic differences in shared decision making in cancer treatment: a systematic literature review." Poster Presentation at the Academy Health Annual Research Meeting in Orlando, FL. June 2012.
7. **Mead E\***, Rimal RN, Roser-Renouf C, Flora J, Maibach E, Leiserowitz A. "Adopting climate control behaviors at the household level: A risk perception attitude (RPA) framework approach." Oral Presentation at the American Public Health Association Annual Meeting and Exposition in Washington, DC. October 2011.
8. **Mead E\***, Rimal RN, Roser-Renouf C, Flora J, Maibach E, Leiserowitz A. "Engaging adolescents in climate change through information seeking: A risk perception attitude (RPA) framework approach." Student Achievement Poster Presentation at the American Public Health Association Annual Meeting and Exposition in Washington, DC. October 2011.
9. **Mead E\***, Klassen A. "An exploratory analysis of alcohol consumption and cancer-related dietary risk among low-income African American women in Washington, DC." Poster presentation at the Fourth AACR Conference on The Science of Cancer Health Disparities in Washington, DC. September 2011.
10. Sharma S, Oberdorff BL, Butler JL, Rittmueller S, Hopping BN, Shelton A, Lupu ME, Cao X, **Mead E**, Buchan A, Roache C, Gittelsohn J. "Assessing dietary intake and lifestyle among Inuit." Poster Presentation at the 4<sup>th</sup> African Nutrition Epidemiology Conference in Nairobi, Kenya. October 2010.
11. **Mead E\***, Gittelsohn J, Roache C, Sharma S. "Do knowledge and attitudes affect dietary behaviors in a population undergoing a radical transition in food access, acquisition, and preparation?" Poster Presentation at Experimental Biology in Anaheim, CA. April 2010.
12. Sharma S, Hopping BN, **Mead E**, Erber E, Buchan A, Roache C. "Inadequate diets in an Arctic population undergoing a drastic environmental change." Poster Presentation at Experimental Biology in Anaheim, CA, USA. April 2010.
13. **Mead EL\***, Kratzmann M, Roache C, Reid R, Gittelsohn J, Sangita S. "Factors influencing diet and the food environment in two Inuit communities in Nunavut: Qualitative formative research results from Healthy Foods North." Oral Presentation at the International Congress on Circumpolar Health in Yellowknife, NT, Canada. July 2009.
14. **Mead EL\***, Gittelsohn J, Roache C, Reid, R, Sharma S. "The influence of psychosocial factors on food-related behaviors among Inuit communities in



- Nunavut: Results from Healthy Foods North.” Oral Presentation at the International Congress on Circumpolar Health in Yellowknife, NT, Canada. July 2009.
15. **Mead EL\***, Gittelsohn J, De Roose E, Biggs S, Reaburn S, Sharma S. “The psychosocial determinants of diet-related behaviors among the Inuvialuit: Results from Healthy Foods North.” Poster Presentation at the International Congress on Circumpolar Health in Yellowknife, NT, Canada. July 2009.
  16. Hopping BN, **Mead E**, Erber E, Roache C, Reid R, Gittelsohn J, Sharma S. “Nutrient intake among Inuit in the Canadian Arctic: Results from Healthy Foods North.” Poster Presentation at the International Congress on Circumpolar Health in Yellowknife, NT, Canada. July 2009.
  17. Ugyuk M, Rosol R, **Mead E**, Roache C, Reid R, Gittelsohn J, Sharma S. “Implementing a nutrition intervention program among Inuit in Nunavut: Store-centered activities of Healthy Foods North.” Poster Presentation at the International Congress on Circumpolar Health in Yellowknife, NT, Canada. July 2009.
  18. Johnson JS, Asay E, **Mead E**, Sharma S. “Helping Ourselves to Health: Addressing the Factors that Contribute to Obesity among Alaska Native People.” Poster Presentation at the International Congress on Circumpolar Health in Yellowknife, NT, Canada. July 2009.

**Local/School-Based Meetings:**

19. **Mead EL\***, Doorenbos AZ, Flum DR, Morris AM. “Racial and ethnic difference in shared decision making in cancer treatment: A systematic literature review.” Poster Presentation at the 8<sup>th</sup> Annual Cancer Epidemiology, Prevention, and Control Trainee Symposium, Baltimore, MD. May 2012.
20. **Mead EL\***, Doorenbos AZ, Flum DR, Morris AM. “Racial and ethnic difference in shared decision making in cancer treatment: A systematic literature review.” Poster Presentation at the Michigan Institute for Clinical & Health Research Symposium, Ann Arbor, MI. March 2012.
21. **Mead EL\***. “Racial and ethnic differences in shared decision making in cancer treatment: A mixed methods approach to a systematic literature review.” Invited Oral Presentation at the Mixed Methods Interest Group at Johns Hopkins Bloomberg School of Public Health, Baltimore, MD. February 2012.
22. **Mead E\***, Klassen A. “An exploratory analysis of alcohol consumption and cancer-related dietary risk among low-income African American women in Washington, DC.” Poster Presentation at the 7<sup>th</sup> Annual Cancer Epidemiology, Prevention, and Control Trainee Symposium, Baltimore, MD. May 2011.
23. **Mead E\***. “A community-based nutritional and lifestyle intervention to improve the health status of Inuit undergoing the nutrition transition in Arctic Canada.” Poster Presentation at the Global Health Day Student Experience Fair at Johns Hopkins Bloomberg School of Public Health, Baltimore, MD. February 2011.

24. **Mead E\***. “International Dietary Assessment from the Arctic to the Amazon.” Invited Oral Presentation (on PI’s behalf) at the Nutrition Research Institute in Kannapolis, NC. November 2009.
25. **Mead E\***. “Why should you eat healthy and exercise?” Invited Oral Presentation (on PI’s behalf) at the Nutrition Research Institute, Kannapolis, NC. September 2009.
26. Hopping B, **Mead E**, Erber E, Roache C, Reid R, Gittelsohn J, Sharma S. “Nutrient intake among Inuit in the Canadian Arctic: Results from Healthy Foods North.” Poster presentation at the University of Hawaii at Manoa, College of Tropical Agriculture and Human Resources (CTAHR) Student Research Symposium. April 2009.