

EXAMINING TOBACCO POINT OF SALE
ADVERTISING AROUND TULSA PUBLIC SCHOOLS
HIGH SCHOOLS

By

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Abstract: The purpose of this study was to examine the relationship between tobacco point of sale advertising in convenience stores within a ½ mile radius of public high schools and the socioeconomic status of the student population and area that the school is in. The population of interest was high school aged adolescents in the urban Tulsa area. Socioeconomic status was determined by graduation rate, free or reduced lunch, median household income, poverty level, percentage of minority population, and percentage of population with less than a high school graduate education. Student demographics was gathered from the Tulsa Public Schools system and the Oklahoma State Department of Education State Public Enrollment Totals for fiscal year 2015-2016. Neighborhood demographics was drawn from the US Census Bureau 2010-2014 American Survey 5-year Estimate. There were 7 high schools and 10 convenience stores included in this study. Data was collected in a descriptive cross sectional manner. Data was analyzed for statistical significance in SPSS (Version 23). The 7 high schools and socioeconomic status were the independent variables. There were 7 dependent variables studied; total signage, outdoor signage, indoor signage, price promotion, positive wording, colorful advertisements, and most advertised brands (Newport and Marlboro). The total signage was also tabulated for mean and standard deviation across all socioeconomic areas to understand an average of tobacco signage within a ½ mile radius of all included high schools regardless of SES in the Tulsa Public Schools system. Multiple independent sample *t*-tests were completed to test for significance based on the variables of interest were conducted using SPSS (Version 23). A Bonferroni correction was applied to counteract the problem of multiple comparisons, the adjusted alpha levels of .017 per test (.05/3) was utilized. It was found that there was significantly more Newport tobacco signage around the school of very low SES compared to areas of low SES. There were no other statistically significant results. Further research is recommended to increase the size of the study to include areas of suburban, peri-urban, and rural school districts as well as areas of high socioeconomic status.

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CHAPTER I

INTRODUCTION

Cigarette smoking continues to remain a public health threat the United States. Tobacco smoking is responsible for the deaths of 480,000 Americans yearly, with smokers dying approximately 10 years earlier than nonsmokers (Oza, Thun, Henley, Lopez, & Ezzati, 2011; Centers for Disease Control and Prevention [CDC], 2015a; CDC, 2015c). Smoking is now the leading cause of preventable death in the United States and is a primary risk factor in the 3 leading causes of death in the United States: heart disease, cancer, and chronic lower respiratory infections (John et al., 2009; CDC, 2013, CDC, 2015d). Chronic lower respiratory infections, whose leading risk factor is smoking which accounts for 80% of COPD incidence rate, has now overtaken cerebrovascular disease and unintentional accidents to become the third leading cause of death in the United States (CDC, 2013; CDC 2015d). Tobacco smoking also has profound impacts on the US economy, causing over \$300 billion yearly in healthcare related expenses and lost productivity in the workplace (CDC, 2015b; Doescher, Jackson, Jerant, & Hart, 2006).

Oklahomans are especially vulnerable to the effects of smoking due to our continued elevated tobacco abuse compared to our peers in other states. As of 2009, Oklahoma was third in the nation in smoking prevalence with 25.5% of the Oklahoma population being regular smokers, compared to 16.8% smoking prevalence nationally (McClave, Rock, Thorne, & Malarcher, 2011;

CDC, 2015a). Every year approximately 120,000 Oklahoma tobacco abusers require hospitalization as a result of their tobacco abuse (Leuthard, Beebe, Halstrad, Olson, & Royston, 2005). Due to such high tobacco abuse prevalence, tobacco is also the leading cause of preventable death within Oklahoma (Oklahoma State Department of Health [OSDH], 2014). Approximately 7,500 Oklahomans die each year as a result of tobacco smoking, more than alcohol, auto accidents, AIDS, suicides, murders, and illegal drugs combined (CDC, 2016a; Fallin, 2015; OSDH, 2014). The leading causes of death in Oklahoma are also the same as nationally, what is distressing is the rate at which these diseases affect Oklahomans (OSDH 2014). Oklahoma ranks 3rd nationally in heart disease deaths, 12th in cancer deaths, and leads the nation in rates of death caused by COPD (OSDH, 2014). Again, tobacco is a primary risk factor for all of these diseases (CDC, 2015d). Oklahomans spend over \$1 billion each year in smoking related health care costs and \$2 billion annually is lost from the Oklahoma economy due to tobacco abuse (OSDH, 2014; Fallin, 2015).

Cigarette smoking is not a habit that begins in a vacuum. Like many other habits there are factors that influence its initiation, sustainment, cessation, and prevention. The most effective step in avoiding the detrimental effects of tobacco smoke is preventing the initiation of tobacco use. To do this requires an understanding of the environment of a potential smoker and what factors can lead towards the uptake of a cigarette smoking habit. These factors, along with smoking prevalence, have changed drastically over the past 2 decades. What has not changed though is that one particular age group remains at the forefront of tobacco prevention and that is adolescents. This is because approximately 90% of all adult smokers had at least 1 cigarette prior to turning 18 with 72% being full time smokers prior to their 18th birthday (American Cancer Society, 2014; Green et al., 2007). So any successful intervention must target this age group in order to see the highest amount of success in smoking prevention.

Over the past 2 decades Oklahoma adolescent smoking prevalence has significantly decreased. In 1999 roughly 33% of the high school aged adolescents were current cigarette smokers, by 2015 that number had dropped to 14.6% (OSDH, 2015). While this is a significant improvement, Oklahoma youth tobacco remains amongst the highest in the United States. Oklahoma ranks 41st out of 44 reporting states in youth tobacco prevalence with an estimated 57,400 Oklahoma children currently addicted to tobacco and an additional 12 children becoming regular smokers each day (CDC, 2012; OSDH Students Working Against Tobacco, 2016; OSDH, 2014). To poignantly address how disproportionately Oklahoma teens are smoking compared to their national peers, while 14.6% of Oklahoma high school aged teens have smoked a cigarette in the last 30 days, nationally only 9.3% of high school aged teens have smoked a cigarette in the last 30 days (OSDH, 2015).

The federal government recognized that past efforts at restricting tobacco advertising practices had failed to effectively reduce tobacco use amongst adolescents and so with the passage of the Family Smoking Prevention and Tobacco Control Act the Food and Drug Administration was given new regulating powers over many aspects of the tobacco industry (Family Smoking Prevention and Tobacco Control Act, 2009). It is through this legislation that the government was able to both stop the use of marketing cigarettes as light and cease the production of flavored cigarettes, both of which were shown to be disproportionately used by adolescents; it also allows states to enact restrictions of tobacco advertising at the point of sale which could potentially prohibit tobacco sales near schools, churches, community centers, and locations which cater to the adolescent population (CDC, 2016a; U.S. Food and Drug Administration, 2015; Barnoya et al., 2014).

Oklahoma should begin taking steps in order to restrict tobacco advertising from reaching adolescent youth. That can be most effectively done at the point of sale. Tobacco point of sale

advertising targets the most socioeconomically disadvantaged members of society, minorities, and the young (Brown-Johnson et al., 2014). There are higher levels of point of sale advertising in neighborhoods with high poverty levels and in neighborhoods with greater amounts of children and adolescents (Snell & Bailey, 2005). Within Oklahoma County areas of low socioeconomic status have greater number of tobacco ads that are close to the ground potentially targeting the youth that live in these neighborhoods (Widome, Brock, Noble, & Foster, 2013). Yet the ability given to the states to restrict the point of sale advertising of tobacco products has not been fully taken advantage of in Oklahoma.

Statement of the Problem

Point of sale advertising is a marketing strategy which places sales promotion and signage either at or near a register meant to catch a customer's eye prior to them making a purchase. Point of sale ads can be located in the interior or exterior of retail stores, on shelving displays, includes price discounts for potential consumers, and promotional payments to retailers by tobacco for specific product placement within the store (MacKintosh, Moodie, & Hastings, 2012; Campaign for Tobacco Free Kids, 2016). The tobacco industry has made a niche in this form of advertising and invested greatly in it by spending more money on this form of advertising than any other form of advertising (Agaku & Ayo-Yusuf, 2014; Henriksen, Flora, Feighery, & Fortmann, 2002). This focus on point of sale advertising could potentially be due to the regulated closing of other forms of advertising allowed to the tobacco industry. In 2003, the tobacco industry spent \$15.2 billion on product advertising, 84% of which was used at point-of-sale locations (John et al., 2009). By 2013 total promotional expenditures had decreased to \$8.948 billion, but the percentage of that spent at the point of sale had increased to 89.3% (Federal Trade Commission, 2016). The continued investment in point of sale advertising indicates its effectiveness and importance to the tobacco industry.

Much of tobacco point of sale advertising is spent at convenience stores. Advertising for maximum visibility has overwhelmed convenience stores in certain neighborhoods to the point that it is the only signature of a store's presence in a neighborhood (Snell & Bailey, 2005). A problem arises because convenience stores are visited 100 million times per month by US teens, and this creates a perfect environment for getting tobacco products noticed by teens (Henriksen et al., 2002). There are numerous studies that show adolescent views of tobacco and tobacco related behaviors correlate with signage exposure. Adolescents exposed to point of sale advertising have a more positive imagery of tobacco products, believe more peers approved of smoking, smoke the most heavily advertised brands of cigarettes, and have a higher rate of smoking where there is greater density of tobacco advertisements within walking distant of the school compared to their peers that are not exposed to tobacco point of sale advertising (Loomis et al., 2012; Henriksen et al., 2002; Henriksen et al., 2008). Point of sale tobacco advertising has also been shown to increase tobacco exposure, promote tobacco branding, and cause impulsive purchasing (MacKintosh et al., 2012). Previous research and policy has evaluated a companies' rights to advertise their products. However, there remains questions as to if such a substance, shown to be the leading cause of preventable death, meant only for adult consumption, should be advertised in an environment so heavily frequented by America's youth.

Purpose of the Study

The purpose of this thesis study is to explore the relationship between neighborhood socioeconomic status and tobacco signage, specifically by tabulating cigarette point of sale advertisements at convenience stores within a ½ mile radius of Tulsa Public Schools' high schools.

Hypothesis

It is hypothesized that as areas of socioeconomic status decreases there will be increased tobacco signage at convenience stores within ½ mile radius of high schools.

Significance

Oklahoma continues to struggle with underage tobacco abuse. Currently 14.7% of Oklahoma high school adolescents have smoked a cigarette in the last 30 days (OSDH, 2015). Since 90% of all adult smokers had at least 1 cigarette prior to turning 18, the adolescent age group must be the focus of tobacco abuse prevention strategies (American Cancer Society, 2014). Point of sale advertising is the most commonly used medium for tobacco advertising with the tobacco industry spending 89.3% of their promotional advertising (Federal Trade Commission, 2016). Much of this advertising is used at convenience stores, which also happen to be visited 100 million times per month by the US teens (Henriksen et al., 2002). At the time of this thesis, I could not find any policies in Oklahoma regulating the use of tobacco point of sale advertising near schools. This presents a potentially unlimited ability for the tobacco industry to promote cigarette use around schools. The results of this study could illustrate the amount of tobacco advertising that Oklahoma teens face when entering a convenience store near their high schools and also could highlight the exorbitant amount of tobacco signage those from low SES backgrounds are inundated with compared to their more affluent peers.

Operational Definitions

Adolescence:

Adolescence is the period of life between the onset of puberty until adulthood, generally from 11-21 years old (Hagan, Shaw, Duncan, 2008). This period of life brings about significant change to the individual taking them from childhood and into adulthood. The American Academy

of Pediatrics has recognized that with such drastic changes occurring in a relative short period of time, adolescence needs to be broken down into segments to provide the best health outcomes to the adolescent population.

Early adolescence is defined as those years from 11-14 (Hagan, Shaw, Duncan, 2008). This roughly corresponds with middle school grades. It is in this age group that Hagan, Shaw, Duncan (2008) recognizes the influence of intrapersonal beliefs, peer influence, social dynamics, and the effects of the surrounding community. They also raise awareness of the need for risk reduction including the negative health effects of tobacco. The OSDH and CDC also specifically recognizes this separate grouping of adolescents. Middle school aged students are separated from high school aged students in regards to their tobacco use habits (OSDH, 2015; CDC, 2016b). Currently 4.1% of Oklahoma middle school adolescents have smoked a cigarette in the last 30 days (OSDH, 2015).

Middle adolescence is defined as those years from 15-17 (Hagan, Shaw, Duncan, 2008). This corresponds to with high school grades. In this age group Hagan, Shaw, Duncan (2008) continues to recognize the influence of intrapersonal, interpersonal, and community influences but takes advises a more direct approach with risk behavior and mitigation. The OSDH and CDC also specifically group this cohort of adolescents for risk behavior. High school students are specifically monitored for their tobacco use habits and as they progress through high school there is an increased prevalence of smoking (OSDH, 2015; CDC, 2016b; CDC, 2016a). Currently 14.6% of Oklahoma high school students have smoked a cigarette in the last 30 days (OSDH, 2015).

I recognize and appreciate previous research concerning adolescents as a whole and the effects that tobacco point of sale advertising has on this entire group. This research will be included in order to illustrate that point of sale advertising does not singularly affect one group of

adolescents. For the study portion I will follow previous adolescent age group separations performed by OSDH and CDC in regards to adolescent smoking habits. Since there is a clear distinction in smoking habits from middle school adolescents and high school adolescents, areas around Tulsa Public Schools' high schools will be used for the study.

Point of Sale Advertising:

While there continues to be debate of where placement of signage needs to be for it to be classified as at the point of sale in marketing theory, a concise definition has been presented by the Campaign for Tobacco Free Kids (2016):

(Point of Sale) advertising and promotions refer to a variety of marketing practices, including signs on the interior and exterior of retail stores, functional items like counter mats and change cups, shelving displays, and coupons and other price discounts that reduce the price for the consumer. (Point of Sale) advertising also includes promotional payments to retailers by tobacco companies to have their products placed in specific store locations, making it more likely that consumers will see them.

For the purpose of this study, any advertisements fitting within the above definition will be classified as point of sale advertising.

Convenience Store:

A convenience store for this study is defined as a retail business, smaller than 5,000 sq. ft., which has expanded business hours, where typically gasoline, tobacco, and a variety of goods are sold in smaller quantities than would be found at a grocery, market, or wholesale store (National Association of Convenience Stores, 2016).

Near a School:

Previous studies have evaluated what constitutes as near a school by exploring the walking distance of an entity to a school. For the purpose of this thesis study, guidelines presented by Falb, Kanny, Powell, & Giarrusso (2007) and Henriksen et al. (2008) will be utilized based on their recommendations of a ½ mile radius.

Socioeconomic Status:

Breaking down socioeconomic status of households into fixed groups can be a difficult issue for a firm definition. Economically Fry & Kochhar (2016) of the Pew Research Center defined middle income households as those having an income between 2/3 and double the median income of the state. The median household income in Oklahoma is currently \$46,235 (U.S. Department of Commerce, U.S. Census Bureau, 2015). Using this definition of middle income household along with other elements of socioeconomic status such as graduation rate, free or reduced lunch, poverty level, percentage of minority population, and percentage of population with less than a high school graduate education, for this thesis, socioeconomic status in Oklahoma will be the following:

Very low socioeconomic status will refer to those areas with a substantial burden on the population across all elements compiling socioeconomic status. Low socioeconomic areas will be those areas where the population has burdens in some elements of socioeconomic status. Middle socioeconomic status will be those areas where the population has few burdens in elements of socioeconomic status. High socioeconomic status will refer to those areas that have no burdens on the population in regards to elements compiling socioeconomic status.

CHAPTER II

REVIEW OF LITERATURE

Research concerning tobacco use initiation and promotion has been an area of scholarly investigation for many years. As a result, there is a significant amount of research that focuses on the effects that tobacco advertising has on the adolescents (Spanopoulos, Britton, McNeill, Ratschen, & Szatkowski, 2014; Paynter, Edwards, Schluter, & McDuff, 2009; Bogdanovica, Szatkowski, McNeill, Spanopoulos, & Britton, 2015). There is also research on tobacco point of sale advertising practices in varying socioeconomic areas (Brown-Johnson et al., 2014; Snell & Bailey, 2005; Widome, Brock, Noble, & Forster, 2013). As well as research concerning adolescents' views of their health in relation to smoking initiation (Chang, 2009; Schneider et al., 2010). All of these influences must be understood in order to gain an understanding of how point of sale advertising plays a role in adolescent smoking initiation. After thoroughly reviewing previous research concerning the influences of tobacco point of sale advertising on adolescents, there should be little doubt that this form of marketing affects adolescents' views of tobacco which makes them more susceptible to adopting a smoking habit.

Increased Tobacco Awareness

While the phrase “increasing tobacco awareness” tends to be associated with increasing awareness of the negative effects of tobacco, it is also used by the tobacco industry to increase the

Awareness of their product for potential and current consumers. The industry is not alone in this ploy as many industries such as sports apparel, household products, and foodstuffs promote awareness of their products to potential consumers as a way of increasing company revenue. Tobacco is different from these products though as it is a restricted product meant only for adult consumption. Yet adolescents' awareness of tobacco products through point of sale advertising is a tactic that is making them more likely to adopt a smoking habit (Spanopoulos, Britton, McNeill, Ratschen, & Szatkowski, 2014; MacKintosh, Moodie, & Hastings, 2012; Paynter, Edwards, Schluter, & McDuff, 2009).

As recently as 2014, studies involving tobacco point of sale advertising effects on adolescents' awareness of tobacco have taken place. The promotion of tobacco products is so prevalent that 74.9% of adolescents notice tobacco advertisements either most times or every time that they go to a small shop (Spanopoulos, Britton, McNeill, Ratschen, & Szatkowski, 2014). Those adolescents that did notice tobacco point of sale advertising every time they went to a small shop were more than 3 times more susceptible to smoking initiation than their peers that did not notice point of sale advertising (Spanopoulos, Britton, McNeill, Ratschen, & Szatkowski, 2014). The awareness of tobacco products through point of sale advertising also occurs at a startling young age as a large proportion of youth as young as 11 are being introduced to tobacco products in their daily lives (Spanopoulos, Britton, McNeill, Ratschen, & Szatkowski, 2014). Continued analysis found that smoking susceptibility, initiation, and retention had significant links to the awareness of tobacco point of sale advertising (Spanopoulos, Britton, McNeill, Ratschen, & Szatkowski, 2014). This linkage of increased tobacco product awareness through the point of sale brings about a false sense of tobacco use normalcy leading to increased susceptibility in smoking initiation adolescents.

It is not just that the advertisements are at the point of sale, but they are made in a manner that is meant to attract persons to make a purchase. This attractiveness has a profound impact on youth. Approximately 81% of nonsmoking adolescents have noticed cigarette advertising in shops at the point of sale (MacKintosh, Moodie, & Hastings, 2012). The advertisements caused 17% of those adolescents to pay close attention to the advertising with 27% of those considering the advertisements to be catchy and 13% considering the point of sale advertising attractive (MacKintosh, Moodie, & Hastings, 2012). This reinforces that increasing awareness of tobacco products through point of sale advertising is associated with increased susceptibility to begin smoking. This attractiveness of tobacco point of sale advertising raises an important point that tobacco awareness developed by the tobacco industry is being marketed in positive manners that could potential attract younger adopters of their products.

The awareness of tobacco products through point of sale advertising is a major factor in increased smoking susceptibility in the adolescent population. Approximately 75% of adolescents in New Zealand visit convenience stores at least once a week (Paynter, Edwards, Schluter, & McDuff, 2009). It is at these convenience stores that adolescents are significantly more likely to notice point of sale advertising either most of the time or every time they visit them compared to other retail establishments such as supermarkets or grocery stores (Paynter, Edwards, Schluter, & McDuff, 2009). Roughly 67% of adolescents recalled smoking advertisements in local shops either sometimes or most of the time (Paynter, Edwards, Schluter, & McDuff, 2009). It was also found that the association between exposure to point of sale advertising, which increases tobacco awareness, and smoking susceptibility is equivalent to adolescent smoking susceptibility caused by a parent who currently smokes in the home (Paynter, Edwards, Schluter, & McDuff, 2009). This illustrates the profound impact that tobacco point of sale advertising can have on adolescent smoking susceptibility.

Promotion of Brand Recognition

Brand recognition is another advertising and marketing strategy used by all industries. It is a form of nonverbal communication between a producer and potential consumers. The goal of the strategy is for consumers to purchase a brand that they recognize while passing over brands which they do not. Symbols and color schemes are prominent fixtures that promote brand recognition, examples would include the Apple's bitten apple, Nike's swoosh, and McDonald's gold arches. Brand recognition is also used by the tobacco industry, many menthol cigarettes incorporate green into their color scheme, Marlboro has a distinct design on their cigarette packs, and Camel cigarettes use a Camel with pyramids in the background. Tobacco brand recognition though also increases adolescent susceptibility to smoking.

Branding is so effective that adolescents are able to recognize those products which are marketed to their age group, such as Coca Cola, McDonald's, and Nike nearly 100% of the time (Donovan, Jancey, & Jones, 2002). In Donovan, Jancey, and Jones (2002) study 11% of the adolescent participants had ever tried smoking with approximately 1% being a current regular smoker, unfortunately 88% of the participants were able to correctly identify cigarette brands from logos and nearly 90% can recognize tobacco brands from their names which is a "high level of awareness for adult products supposedly not marketed to the survey group".

With increased exposure and awareness of tobacco branding also comes increased risk of smoking initiation for the adolescent population. For each additional brand that was recognized at the point of sale, the chances of becoming a regular smoker increased by 5% and smoking susceptibility increased on average by 4% (Spanopoulos, Britton, McNeill, Ratschen, & Szatkowski, 2014). Noticing point of sale displays combined with recognizing tobacco branding can compound smoking susceptibility. Nonsmoking adolescents that can recognize at least 1 brand of cigarettes and notice tobacco point of sale advertising at least most of the time when

visiting convenience stores are 3 times as susceptible to smoking initiation compared to their peers that do not recognize branding or do not notice point of sale displays (Bogdanovica, Szatkowski, McNeill, Spanopoulos, & Britton, 2015).

Branding also increases susceptibility through creating a false normalization of tobacco use. Adolescent students exposed to tobacco signage at the point of sale believed that cigarettes advertised more prominently were more popular brands and were more likely to recognize the brand of cigarette in visible displays (Wakefield, Germain, Durkin, & Henriksen (2006). Adolescents also believed that these brands advertised at the point of sale were more likely to be smoked by adults and other adolescents (Wakefield, Germain, Durkin, & Henriksen (2006). When asked which cigarette brand they would be more likely to try, those brands that were advertised at the point of sale were reported to be the most likely brand of cigarette that they would try, indicating the effect of branding on the psyche of potential purchasing (Wakefield, Germain, Durkin, & Henriksen (2006).

Currently approximately 88% of adolescents are able to recall tobacco brands from point of sale advertising in local retail shops (Donovan, Jancey, & Jones, 2002). This ability to recognize tobacco branding is universal, whether the brand holds a significant market share in the region or not, or whether the brand is typically smoked by the adolescent population or not (Donovan, Jancey, & Jones, 2002). A serious concern is that since tobacco branding is recognized even in brands not typically sold in the region which they live or used by adolescents potentially indicates strong evidence that recognition of tobacco brand advertising is more than just a casual recognition from previous encounters and are more likely to be adopted by the adolescent population (Donovan, Jancey, & Jones, 2002).

Contribution to Adolescent Smoking Initiation

Tobacco advertising at the point of sale is meant to and does attract potential customers. The tobacco industry would not invest so heavily in this form of advertising if it were not effective. The problem continues to be that this form of advertising is indiscriminate, attracting potential adult customers but also contributing to adolescent smoking initiation.

Adolescents exposed to tobacco advertising at point of sale have been found to be at greater risk to smoke a cigarette within a year of exposure than those adolescents that are not exposed to tobacco point of sale advertising (Wakefield et al., 2006). Adolescents exposed to tobacco point of sale advertising are also more likely to smoke a cigarette if a cigarette were offered to them by a peer (Wakefield et al., 2006). This indicates that point of sale advertising has a sustained effect on the individual long after exposure and that those exposed to point of sale advertising are more likely to initiate a smoking habit than those that are not exposed to point of sale tobacco advertising.

The finding that susceptibility to smoking initiation occurs for prolonged periods status post exposure to tobacco point of sale advertising is particularly concerning. Tracking adolescents change in smoking susceptibility has found that even those that would be initially described as non-susceptible never smokers who were exposed to point of sale advertising became more susceptible to smoking initiation over time (Bogdanovica, Szatkowski, McNeill, Spanopoulos, & Britton, 2015). Along with increased susceptibility to begin a smoking habit, non-susceptible never smokers' exposure to point of sale advertising increased brand recognition (Bogdanovica, Szatkowski, McNeill, Spanopoulos, & Britton, 2015). The brand recognition in turn compounds increased susceptibility to smoking initiation all caused from initial exposure to tobacco point of sale advertising (Bogdanovica, Szatkowski, McNeill, Spanopoulos, & Britton, 2015). Those non-susceptible never smokers that can recognize 5 or more cigarette brands are twice as likely to

become chronic smokers in their lifetimes than those that do not have that same brand recognition; as well those same non-susceptible never smokers that notice point of sale tobacco advertising frequently and can recognize 6 brands of tobacco are more than 3 times likely to become susceptible to smoking initiation (Bogdanovica, Szatkowski, McNeill, Spanopoulos, & Britton, 2015). Tobacco point of sale advertising can thus work independently to increase susceptibility of smoking initiation in the adolescent population or work in conjunction with brand recognition to compound the risk of susceptibility to smoking initiation.

Ecological Impacts of Smoking Susceptibility

The environment in which an adolescent grows up and spends their time has an impact on their smoking susceptibility. There is significant research on adolescent smoking initiation in relation to their parents, siblings, or peers' tobacco use habits (Rostila et al., 2013; Scalici & Schulz, 2014; De Leeuw et al., 2010; Thrul et al., 2014). Other factors exist concerning smoking susceptibility, such as socioeconomic status and built environment.

Tobacco point of sale advertising varies from neighborhood to neighborhood. Unfortunately, the areas that tobacco point of sale advertising is most prevalent also tend to be the same regions that our most socioeconomic disadvantaged peoples reside. Tobacco point of sale advertising targets those of low socioeconomic status, especially towards minorities, the young, and women (Brown-Johnson et al., 2014). Tobacco companies focus their advertising on low-income inner-city minorities, 'discount-susceptible' smokers, and the less-educated (Brown-Johnson et al., 2014). Strategies included distributing discount coupons with food stamps to reach the very poor, discount offers at point-of-sale, and via direct mail to keep cigarette prices low (Brown-Johnson et al., 2014). These strategies by the tobacco industry presents more difficulties in the prevention of adolescent smoking initiation. By using these promotion advertisements

tobacco products remain economically feasible to the adolescent population even though overall tobacco prices have increased through substantial taxation increases.

Neighborhoods with high adolescent populations also appear to be targeted for increased tobacco point of sale advertising. Research of neighborhood demographics and point of sale advertising has indicated that there is increased advertising in high poverty neighborhoods, especially those with higher percentages of youth from 5-17 years old (Snell & Bailey, 2005). Tobacco advertisements are so extensive in some low-income neighborhoods that the only way to tell that a store is in the neighborhood is from the tobacco advertising on the exterior of the store (Snell & Bailey, 2005). This points towards a concerted effort by the tobacco industry to not only target those of low socioeconomic status, but also areas where there are high amounts of adolescents and children even as young as 5 years old.

The areas where adolescents tend to regularly congregate have also become targets for tobacco point of sale advertising. There is also an approximate 2.25% higher prevalence of smoking among high school aged adolescents when there are greater amounts of tobacco advertising within a ½ mile radius of the school which they attend (Henriksen et al., 2008). There is an inference that higher tobacco outlet density promotes adolescent tobacco use by increasing environmental cues to smoke (Henriksen et al., 2008).

Oklahoma is not immune to these trends of minority, socially disadvantaged, and adolescent targeting of tobacco point of sale advertising. An area's racial and/or ethnic composition is related to how tobacco is advertised in that community's retail establishments. Regions of Oklahoma County with higher amounts of Black, Asian, and Hispanic minorities and lower income neighborhoods are more likely to have greater number of ads for tobacco products, especially menthol cigarettes (Widome, Brock, Noble, & Forster, 2013). There are also more advertisements for tobacco products that have higher prevalence for adolescent abuse rates, such

as menthol cigarettes, in areas with higher adolescent populations (Widome, Brock, Noble, & Forster, 2013). There is an increased amount of tobacco signage within 3 feet of the ground in areas of low socioeconomic status, making the advertisements far more easily viewable to the underage population (Widome, Brock, Noble, & Forster, 2013). In areas where the most socially disadvantaged populations reside, the retail stores tended to have significantly more outside advertisements for tobacco products than areas of more affluent and educated in terms of product placements, advertisements (Widome, Brock, Noble, & Forster, 2013).

Adolescent Health Views of Smoking

Adolescents continue to be disproportionately affected by the tobacco industry's use of proven marketing strategies to promote their products at the point of sale due to influences beyond just marketing theory. Adolescents' lack of comprehensive scope of the negative health consequences of cigarette smoking and their perceived health views put them at risk of smoking initiation. This in combination with point of sale marketing strategies which promote smoking initiation develops an environment that is conducive to underage tobacco use.

Simply put, adolescents do not have an appreciation for potential health impacts of actions that they take currently, especially when these health impacts occur years after initiating the action. Adolescent nonsmoking and perceived threat of smoking by high school aged children is motivated by short-term health consequences such as bad breath (Chang, 2009). These motivations play a much stronger role in lowering the likelihood of smoking, negative smoking attitudes, and lower intention to smoke than long term health consequences such as COPD, heart disease, and cancer (Chang, 2009). It appears that these long-term effects of smoking are beyond the scope of their concern (Chang, 2009). It is also worth noting that the short-term health consequences such as bad breath and body odor are also closely related to social image,

indicating that motivation to not smoke could be more greatly influenced by social factors than any perceived health factors (Chang, 2009).

The adolescent population is either unconcerned or uninformed of the long-term health consequences of smoking. Statistically 0% of the population between 12 and 15 years old have a concern of COPD, the most frequent health consequence of smoking and third leading cause of death in the United States, as a reason for not smoking (Schneider et al., 2010; CDC, 2013). This fundamental lack of knowledge of the primary negative health effect that smoking causes is highly detrimental to the prevention of adolescents smoking. The sole bright note is that the fear of cancer does play a role in adolescents' health related reasoning for not smoking (Schneider et al., 2010). The awareness that cigarette smoking causes cancer does at least provide some health barriers in the prevention of smoking uptake, though it would be for more effective if adolescents had more knowledge of negative health impacts of smoking beyond just cancer prevention such as smoking role in COPD, heart disease, vascular disease, and cerebrovascular disease. Limiting adolescent exposure to tobacco point of sale advertising would also increase protective barriers with the goal of preventing adolescent smoking initiation.

Adolescent Views of Tobacco where Point of Sale Advertising is Banned

The United States is certainly lagging in developing and implementing guidelines, regulations, and laws pertaining towards tobacco point of sale advertising. Many other western countries with similar stringent protections of free speech, such as the Canada, the United Kingdom, Ireland, Australia, Norway, and New Zealand have realized that this form of advertising disproportionately attracts and is marketed towards adolescents. As a result, bans on these forms of advertising have taken place. However, within the United States, currently tobacco products can be advertised within 1000 feet of a school or playground and can be placed below 5 feet which generally is directly in a child's line of sight, all under the auspices of protected speech

(*Lorillard Tobacco Co. v. Reilly*, 2001). Restrictions that have occurred in other western countries have resulted in positive effects on adolescents' views towards tobacco use.

The Republic of Ireland has already implemented of a country wide ban on tobacco advertising at the point of sale. Adolescent views of smoking status post point of sale ban found that 38% of teenagers thought that the removal of tobacco from view made it harder for children to begin smoking (McNeill et al., 2011). Adolescents' views of tobacco use after the ban noted an increase in the de-normalizing of smoking amongst the population (McNeill et al., 2011). The law was also almost universally implemented with 97% of retail companies complying with the law within 2 months (McNeill et al., 2011). Which indicates the ease of implementation of the law once a society firmly stands against tobacco point of sale advertising and has had enough of the tobacco industry targeting, whether directly or indirectly, their children.

A number of Australian states have also implemented bans on tobacco point of sale advertising. After the point of sale bans went into effect smoking among the adolescent population decreased from 15% in the pre-ban to 11% of the 24-months post-ban (Dunlop et al., 2015). Adolescent views of smoking and tobacco products were affected by the ban. Youth over-estimation of smoking prevalence among their peers declined from 54% to 50% within 6-12 months after the point of sale ban went into effect (Dunlop et al., 2015). Adolescents also noted decreasing tobacco advertising at retail stores from 80% to 64% and had a decrease in brand recognition from 65%-59% (Dunlop et al., 2015).

In 2012 New Zealand created policies that prohibited the advertising of tobacco at the point of sale. Since that time New Zealand has seen positive effects in decreasing adolescent tobacco abuse. In 2011 adolescent smoking experimentation, having smoked cigarettes in the past but occurred less than monthly, was 23%, by 2014 smoking experimentation had fallen to 17% (Edwards, Ajmal, Healey, Hoek, 2016). Regular adolescent smoking has fallen from 9% to 7%

and smoking initiation has fallen from 13% to 11% over the same time period (Edwards, Ajmal, Healey, Hoek, 2016). Since the ban has gone into effect there has also been a 4% drop in adolescent attempted tobacco purchasing (Edwards, Ajmal, Healey, Hoek, 2016).

These studies paint a rather grim picture of the effect that point of sale advertising of tobacco products has on the adolescent population. Point of sale advertising increases tobacco awareness in the daily lives of a majority of the adolescent population. This develops the impression that tobacco is a normal occurrence in daily life. It also develops brand recognition of prominent tobacco companies. This brand recognition promotes the purchasing and use of a product. Both tobacco awareness and brand recognition caused by point of sale advertising can lead nonsmokers to becoming susceptible to smoking and reinforce smoking as a habit to those that already smoke. More concerning is that these factors can work in conjunction which increases that risk of susceptibility of smoking to adolescents. Understanding and mitigating point of sale tobacco advertising is essential to decreasing smoking amongst the adolescent population.

Adolescents' environment is currently one that allows for the promotion of tobacco through point of sale advertising. There is not protection of tobacco promotion where children tend to congregate such as schools and playgrounds. These advertisements are also disproportionately located in areas that have higher levels of minorities and those from low socioeconomic backgrounds. The promotions making smoking more economically feasible for these communities and for adolescents.

Children's limited health views on the long term health consequences of smoking make them at higher risk to begin smoking. Compounded with promotional advertisements, making tobacco seem like a normal activity, and making it economically available to them creates an environment which increases adolescent susceptibility to smoking. Tobacco point of sale bans have shown to be effective in reducing adolescent smoking prevalence. These bans have also

decreased adolescent views of smoking normalcy and increase the belief that it would be harder for them to begin smoking.

CHAPTER III

METHODS

Study Design

A quantitative observational research approach was undertaken for this thesis. Cigarette signage was physically counted at convenience stores within ½ mile radiuses of public high schools within the Tulsa Public Schools system. High schools are chosen as these are places where adolescents gather in large numbers routinely. Public schools are chosen as the student body will more closely resemble the demographics of the surrounding area. High school aged adolescents are also the group that has the highest rate of adolescent smoking prevalence (OSDH, 2015; CDC, 2016b; CDC, 2016a). Convenience stores were chosen for this study because they are shown to have the highest average of signage for tobacco products and are visited approximately 100 million times per month by the US teens (John et al., 2009; Henriksen et al., 2002). A ½ mile radius was used as this is the proximity to the school that is also described as walking distance in previous research studies and there is a higher prevalence of current adolescent smoking at schools with more tobacco outlets within walking distance (Falb, Kanny, Powell, & Giarrusso 2007; Henriksen, 2008). These data were collected in a descriptive cross-sectional manner. Signage numbers were tabulated for comparison between areas of varying socioeconomic status. School SES were determined by student demographics and surrounding

area determined by student demographics and surrounding area demographics. Student demographics is provided by the Tulsa Public Schools systems and the Oklahoma State Department of Education State Public Enrollment Totals FY 2015-2016. Surrounding area demographics were comprised of demographic information from the zip code that the school resides in. This information was pulled from the US Census Bureau 2010-2014 American Survey 5-year Estimate.

Procedures

Criteria for inclusion in the study were location, school type, and retail store type. All schools must have been public high schools that pull students from the surrounding neighboring community. All retail stores must have met the definition of a convenience store. Convenience stores had to be within a ½ mile radius of a public high school within the Tulsa Public Schools system. Tobacco products must have been sold in convenience store for inclusion in the study. As convenience stores are relatively small buildings, all cigarette signage on the building, inside the store, and around the cash register were counted and documented for inclusion in the study. Signage from individual stores were kept for comparison on an average store signage basis as well total signage from within the ½ mile radius of the school were tabulated for comparison to other high school areas in the study.

Exclusionary Factors

There was one exclusionary factor, specifically a public high school that can be classified as a magnet school. These schools pull students from throughout a diverse and large school district. This can potentially cause a student body that does not represent the demographic environment where the school is physically located.

Data Analysis

All data analysis was conducted using SPSS (Version 23). As high schools serve a neighboring surrounding area, the zip code of the high school were inputted into the US Census Bureau 2010-2014 American Community Survey 5-year Estimate to determine the demographics of the surrounding area. That information along with student demographics provided by the Tulsa Public Schools system was then used to assist in the determination of the socioeconomic status of the area. Oklahoma demographics were used for baseline to determine socioeconomic status of the area. Oklahoma demographics were pulled from the US Census Bureau 2010-2014 American Community Survey 5-year Estimate except for the percentage of minorities in Oklahoma high schools which were provided by the Oklahoma State Department of Education State Public Enrollment Totals FY 2015-2016. The area surrounding the school was placed into separate socioeconomic categories.

All of the convenience stores within a ½ mile radius of a high school were included in the study. All point of sale cigarette advertisements at the convenience stores were counted and logged. The total number of point of sale advertisements was calculated for the surrounding area of the school. Signage was differentiated based on outdoor signage, indoor signage, price promotion (special price, discount pricing, etc.), positive wording (bold, pleasure, etc.), colorful advertisements, and most heavily advertised brands to better understand if there are differences in these forms of advertisements in different socioeconomic areas. The total signage was tabulated for mean and standard deviation across all socioeconomic regions to understand an average of tobacco signage within a ½ mile radius of all included high schools in the Tulsa Public Schools system.

Tobacco signage of individual stores surrounding the ½ mile radius of a high school was inputted into SES categories depending on the SES of the region which the school resides. Multiple independent sample *t*-tests were completed to test for significance based on the variables of interest will be conducted using SPSS (Version 23). A Bonferroni correction was applied to

counteract the problem of multiple comparisons, the adjusted alpha levels of .017 per test (.05/3) was utilized. For the variable “signage,” mean and standard deviation of the sample was calculated. This was done to understand if there is a statistical difference in total signage per store within the different socioeconomic regions within Tulsa Public Schools. Additional independent sample *t*-tests were completed to test if there is a statistical difference in outdoor signage, indoor signage, price promotion (special price, discount pricing, etc.), branding, positive wording (bold, pleasure, etc.), colorful advertisements, and most heavily advertised brands around Tulsa Public Schools high schools.

CHAPTER IV

RESULTS

Descriptive Statistics

There were ten convenience stores that met criteria for inclusion in this thesis. There were seven high schools included in this thesis. Four high schools within the Tulsa Public Schools system were excluded due to their ability to be described as a magnet school. The schools were separated into three separate categories based on the socioeconomic status of the student body and area that the school resides. Socioeconomic status was determined by analyzing the median household income, poverty rate, and high school graduation rate of the population living around the school as well as the minority population, graduation rate, and free/reduced lunch population of the school. The study focused on tobacco signage at convenience stores within the ½ mile radius of the high schools. Total signage both indoor and outside was tabulated along with price promotion (special price, discount pricing, etc.), branding, positive wording (bold, pleasure, etc.), colorful advertisements, and most heavily advertised brands. Total tobacco signage was also tabulated to understand an average of tobacco signage within a ½ mile radius of all included high schools in the Tulsa Public Schools system regardless of socioeconomic status.

There was one school that was classified as very low socioeconomic status, four schools that were classified as low socioeconomic status, and two schools that were classified as middle

socioeconomic status. The state baselines used were median household income which was \$46,235, percentage of minority student body which was 38.7%, percentage of the population living below the poverty level which was 16.9%, and percentage of the population with less than a high school graduate education which was 13.3%.

School A which was very low socioeconomically was located in an area with a median household income of \$26,793. The school's minority student body comprised 84.2% of the student body. The graduation rate was 42.2%. Free or reduced lunches were provided to 73.9% of the student body. In the surrounding area 37.1% of the population lived below the poverty level and 17.2% of the population had less than a high school graduate education.

The four schools which were classified as low socioeconomic had a median household income ranging from \$32,493 - \$41,824. These schools' minority student body comprised between 56.8% and 76.2% of the student body. The graduation rate was between 57% to 77%. Free or reduced lunches were provided to 70.8% to 88.8% of the student body. In the surrounding area between 15.6% and 24.6% of the population lived below the poverty level and between 14.9% and 24.6% of the population had less than a high school graduate education.

The two schools which were classified as middle socioeconomic had a median household income ranging from \$44,210 - \$47,124. These schools' minority student body comprised 39.6% and 65.3% of the student body. The graduation rate was 60.4% and 82%. Free or reduced lunches were provided to 61.1% and 43.8% of the student body. In the surrounding area 13.5% and 11.7% of the population lived below the poverty level also 8.7% and 4.7% of the population had less than a high school graduate education. Table 1 displays the income statistics and population demographics of the high schools included in the study as well as the state averages where applicable for a baseline comparison.

Table 1. *School and Neighboring Area Demographics*

	Median Household Income	Student Pop.	% minority (African American, Hispanic, Native American) student body	% below poverty level	% with less than HS grad education	Graduation rate	Free or reduced lunch	SES Status
School A	\$26,793	608	84.2%	37.1%	17.2%	42.2%	73.9%	Very Low
School B	\$32,493	585	75.7%	24.2%	18.2%	77%	70.8%	Low
School C	\$36,388	507	56.8%	24.6%	14.9%	57%	88.8%	Low
School D	\$41,824	1,079	76.2%	15.6%	24.6%	61.7%	87.3%	Low
School E	\$40,700	1,129	69.5%	22.1%	19.1%	60.4%	79.5%	Low
School F	\$44,210	1,039	65.3%	13.5%	8.7%	60.3%	61.1%	Middle
School G	\$47,124	1,173	39.6%	11.7%	4.7%	82%	43.8%	Middle
State Average	\$46,235	---	38.7%	16.9%	13.3%	---	---	---

There were two convenience stores that sold tobacco within the area of very low socioeconomic status. The two stores had a mean signage of 27 ($SD=1.41421$). The two stores had a mean outdoor signage of 4.5 ($SD 3.53553$) and a mean indoor signage of 22.5 ($SD=4.94975$).

Store 1 had 26 total cigarette advertisements (7 outside cigarette advertisements, 19 inside cigarette advertisements), 8 pricing promotion advertisements, 24 branding advertisements, 10 positive wording advertisements, and 21 colorful advertisements. The most heavily advertised brands were Newport with 15 advertisements and Marlboro and Winston with 5 advertisements. Maverick had 3 advertisements, Kool had 2 advertisements, and Virginia Slim had 1 advertisement.

Store 2 had 28 total cigarette advertisements (2 outside cigarette advertisements, 26 inside cigarette advertisements), 9 pricing promotion advertisements, 21 branding advertisements, 10 positive wording advertisements, and 19 colorful advertisements. The most heavily advertised brands were Newport with 12 advertisements, Pall Mall with 5 advertisements, and Camel with 4 advertisements. Marlboro had 1 advertisement.

There were 7 convenience stores (Stores 3-9) that sold tobacco within the areas of low socioeconomic status. The 7 stores had a mean signage of 32.8571 ($SD=16.96495$). The 7 stores had a mean outdoor signage of 5.1429 ($SD=2.60951$) and a mean indoor signage of 27.7143 ($SD=15.1296$).

Store 3 had 30 total cigarette advertisements (6 outside cigarette advertisements, 24 inside cigarette advertisements), 11 pricing promotion advertisements, 18 branding advertisements, 7 positive wording advertisements, and 19 colorful advertisements. The most heavily advertised brands were Newport with 7 advertisements, Pall Mall with 4 advertisements, and Marlboro with 3 advertisements. Camel had 2 advertisements and Winston, Kool, and Maverick each had 1 advertisement.

Store 4 had 10 total cigarette advertisements (0 outside cigarette advertisements, 10 inside cigarette advertisements), 0 pricing promotion advertisements, 3 branding advertisements, 2 positive wording advertisements, and 3 colorful advertisements. Marlboro was the only advertised brand with 3 advertisements.

Store 5 had 59 total cigarette advertisements (7 outside cigarette advertisements, 52 inside cigarette advertisements), 16 pricing promotion advertisements, 29 branding advertisements, 14 positive wording advertisements, and 30 colorful advertisements. The most heavily advertised brand was Marlboro with 19 advertisements. Newport, Winston, Maverick,

Camel, and American Spirit each had 3 advertisements. Kool and Echo had 2 advertisements. Pall Mall, Time, and L&M each had 1 advertisement.

Store 6 had 23 total cigarette advertisements (4 outside cigarette advertisements, 19 inside cigarette advertisements), 11 pricing promotion advertisements, 15 branding advertisements, 6 positive wording advertisements, and 13 colorful advertisements. Newport was the most heavily advertised cigarette with 6 advertisements. Edgefield had 3 advertisements. Marlboro and Camel had 2 advertisements. Pall Mall, Echo, and Maverick each had 1 advertisement.

Store 7 had 20 total cigarette advertisements (6 outside cigarette advertisements, 14 inside cigarette advertisements), 2 pricing promotion advertisements, 14 branding advertisements, 3 positive wording advertisements, and 15 colorful advertisements. The most heavily advertised brand was Winston with 7 advertisements. Marlboro had 3 advertisements. Maverick and Echo had 2 advertisements. Kool had 1 advertisement.

Store 8 had 43 total cigarette advertisements (5 outside cigarette advertisements, 38 inside cigarette advertisements), 24 pricing promotion advertisements, 28 branding advertisements, 14 positive wording advertisements, and 30 colorful advertisements. Marlboro was the most heavily advertised cigarette with 17 advertisements. Newport had 5 advertisements. Camel had 3 advertisements. Pall Mall, Winston, and American Spirit each had 2 advertisements. Kool and Maverick each had 1 advertisement.

Store 9 had 45 total cigarette advertisements (8 outside cigarette advertisements, 37 inside cigarette advertisements), 29 pricing promotion advertisements, 34 branding advertisements, 15 positive wording advertisements, and 35 colorful advertisements. Marlboro was the most heavily advertised cigarette with 16 advertisements. Newport, Winston, and Camel

each had 4 advertisements. Kool had 3 advertisements. American Spirit and L&M each had 1 advertisement.

There was 1 store that sold tobacco in the areas of middle socioeconomic status. There was a mean signage of 11.5 ($SD=16.26346$). There was a mean outdoor signage of 0.5 ($SD=0.70711$) and a mean indoor signage of 11 ($SD=15.55635$).

There were no convenience stores within a ½ mile radius of school F. Store 10 had 23 total cigarette advertisements (1 outside cigarette advertisements, 22 inside cigarette advertisements), 10 pricing promotion advertisements, 15 branding advertisements, 7 positive wording advertisements, and 13 colorful advertisements. Marlboro was the most heavily advertised cigarette with 4 advertisements. Newport and Camel each had 3 advertisements. Pall Mall and American Spirit had 2 advertisements. L&M each had 1 advertisement.

Store signage descriptive statistics for total tobacco point of sale signage, outdoor signage, and indoor signage in a given socioeconomic area as well as the all areas regardless of socioeconomic status are shown in Table 2. The type of point of sale advertising descriptive statistics for given socioeconomic status are shown in Table 3. The most heavily advertised cigarette brands descriptive statistics for a given socioeconomic status are shown in Table 4.

Table 2. *Store Signage Descriptive Statistics*

	M_{total}	SD_{total}	$M_{outside}$	$SD_{outside}$	M_{inside}	SD_{inside}
Very Low SES	27	1.41421	4.5	3.53553	22.5	16.96495
Low SES	32.8571	16.96495	5.1429	2.60951	27.7143	15.1296
Middle SES	11.5	16.26346	0.5	0.70711	11	15.55635
Total	27.9091	16.44661	4.1818	2.96034	23.7273	14.41590

Table 3. *Types of Signage Descriptive Statistics*

	<i>M_{PP}</i>	<i>SD_{PP}</i>	<i>M_B</i>	<i>SD_B</i>	<i>M_{PW}</i>	<i>SD_{PW}</i>	<i>M_{CA}</i>	<i>SD_{CA}</i>
Very Low SES	8.50	0.707	22.50	2.121	10.00	0.00	20.00	1.414
Low SES	13.29	10.673	20.14	10.761	8.71	5.529	20.71	11.441
Middle SES	5.00	7.071	7.5	10.607	3.50	4.950	6.50	9.192

Note. PP: price promotion, B: branding, PW: positive wording, CA: colorful advertising

Table 4. *Most Heavily Advertised Cigarette Brands*

	<i>M_{Newport}</i>	<i>SD_{Newport}</i>	<i>M_{Marlboro}</i>	<i>SD_{Marlboro}</i>
Very Low SES	13.50	2.121	3.00	2.828
Low SES	2.71	2.812	9.00	7.853
Middle SES	1.50	2.121	2.00	2.828

Analysis of Research

Research Question 1

As socioeconomic status decreased was there a statistical difference in the amount of tobacco point of sale advertising within a ½ mile radius of public high schools in the Tulsa Public Schools system? To answer this question multiple independent sample *t*-tests for significance was performed. Tests of the priori hypothesis were conducted using Bonferroni adjusted alpha levels of .017 per test (.05/3). The null hypothesis was as follows:

H₀: There is no significant difference in the amount of point of sale advertising means at convenience stores around public high school in the Tulsa Public Schools system based on socioeconomic status.

There were 3 independent sample *t*-tests performed; very low SES vs. low SES, low SES vs. middle SES, and very low SES vs. middle SES respectively. The first independent sample *t*-test showed that the difference in total signage between very low SES ($n = 2, M = 27.00, SD = 1.414$) and low SES ($n = 7, M = 32.86, SD = 16.965$) were not statistically significant, $t(7) = -0.465, p = 0.656, 98.3\% \text{ CI } [-45.088, 33.373], d = -0.3515$. The second independent sample *t*-test showed that the difference in total signage between low SES ($n = 7, M = 32.86, SD = 16.965$) and middle SES ($n = 2, M = 11.50, SD = 16.263$) were not statistically significant, $t(7) = 1.579, p = 0.158, 98.3\% \text{ CI } [-20.746, 63.461], d = 1.19361$. The third independent sample *t*-test showed that the difference in total signage between very low SES ($n = 2, M = 27.00, SD = 1.414$) and middle SES ($n = 2, M = 11.50, SD = 16.263$) were not statistically significant, $t(2) = 1.343, p = 0.311, 98.3\% \text{ CI } [-71.901, 102.901], d = 1.89929$. Therefore, the null hypothesis must be retained. Statistical analysis outcomes for research question 1 are shown in Table 5.

Table 5. *Signage Descriptives*

	SES status		SES status		<i>t</i> (7)	98.3% CI	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Very Low v. Low	27.00	1.414	32.86	16.965	-0.465	[-45.088, 33.373]	-0.3515
Low v. Middle	32.86	16.965	11.50	16.263	1.579	[-20.746, 63.461]	1.19361
Very Low v. Middle	27.00	1.414	11.50	16.263	1.343	[-71.901, 102.901]	1.89929

Research Question 2

As socioeconomic status decreased was there a statistical difference in the amount of outdoor tobacco point of sale advertising within a ½ mile radius of public high schools in the Tulsa Public Schools system? To answer this question multiple independent sample *t*-tests for significance was performed. Tests of the priori hypothesis were conducted using Bonferroni adjusted alpha levels of .017 per test (.05/3). The null hypothesis was as follows:

H₀: There is no significant difference in the amount of outdoor point of sale advertising means at convenience stores around public high school in the Tulsa Public Schools system based on socioeconomic status.

There were 3 independent sample *t*-tests performed; very low SES vs. low SES, low SES vs. middle SES, and very low SES vs. middle SES respectively. The first independent sample *t*-test showed that the difference in outdoor signage between very low SES ($n = 2$, $M = 4.50$, $SD = 3.536$) and low SES ($n = 7$, $M = 5.14$, $SD = 2.610$) were not statistically significant, $t(7) = -0.290$, $p = 0.780$, 98.3% CI [-7.535, 6.249], $d = -0.2192$. The second independent sample *t*-test showed that the difference in outdoor signage between low SES ($n = 7$, $M = 5.14$, $SD = 2.610$) and middle SES ($n = 2$, $M = 0.50$, $SD = 0.707$) were not statistically significant, $t(7) = 2.382$, $p = 0.049$, 98.3% CI [-1.425, 10.710], $d = 1.80$. The third independent sample *t*-test showed that the difference in outdoor signage between very low SES ($n = 2$, $M = 4.50$, $SD = 3.536$) and middle SES ($n = 2$, $M = 0.50$, $SD = 0.707$) were not statistically significant, $t(2) = 1.569$, $p = 0.257$, 98.3% CI [-15.304, 23.304], $d = 2.2189$. Therefore, the null hypothesis must be retained. Statistical analysis outcomes for research question 2 are shown in Table 6.

Table 6. *Outdoor Signage Descriptives*

	SES status		SES status		<i>t</i> (7)	98.3% CI	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Very Low v. Low	4.50	3.536	5.14	2.610	-0.290	[-7.545, 6.249]	-0.2192
Low v. Middle	5.14	2.610	0.50	0.707	-2.383	[-1.425, 10.710]	1.80
Very Low v. Middle	4.50	3.536	0.50	0.707	1.569	[-15.304, 23.304]	2.2189

Research Question 3

As socioeconomic status decreased was there a statistical difference in the amount of indoor tobacco point of sale advertising within a ½ mile radius of public high schools in the Tulsa Public Schools system? To answer this question multiple independent sample *t*-tests for significance was performed. Tests of the priori hypothesis were conducted using Bonferroni adjusted alpha levels of .017 per test (.05/3). The null hypothesis was as follows:

H₀: There is no significant difference in the amount of indoor point of sale advertising means at convenience stores around public high school in the Tulsa Public Schools system based on socioeconomic status.

There were 3 independent sample *t*-tests performed; very low SES vs. low SES, low SES vs. middle SES, and very low SES vs. middle SES respectively. The first independent sample *t*-test showed that the difference in indoor signage between very low SES (*n* = 2, *M* = 22.50, *SD* = 4.950) and low SES (*n* = 7, *M* = 27.71, *SD* = 15.130) were not statistically significant, *t* (7) = -0.460, *p* = 0.659, 98.3% CI [-40.491, 30.062], *d* = -0.34773. The second independent sample *t*-test showed that the difference in indoor signage between low SES (*n* = 7, *M* = 27.71, *SD* =

15.130) and middle SES (n = 2, M = 11.50, SD = 16.263) were not statistically significant, $t(7) = 1.322$, $p = 0.228$, 98.3% CI [-21.971, 54.399], $d = 1.00$. The third independent sample t -test showed that the difference in indoor signage between very low SES (n = 2, M = 22.50, SD = 4.950) and middle SES (n = 2, M = 11.50, SD = 16.263) were not statistically significant, $t(2) = 0.915$, $p = 0.457$, 98.3% CI [-80.016, 102.016], $d = 1.294$. Therefore, the null hypothesis must be retained. Statistical analysis outcomes for research question 3 are shown in Table 7.

Table 7. *Indoor Signage Descriptives*

	SES status		SES status		$t(7)$	98.3% CI	Cohen's d
	M	SD	M	SD			
Very Low v. Low	22.50	4.950	27.71	15.130	-0.460	[-40.491, 30.062]	-0.34773
Low v. Middle	27.71	15.130	11.50	16.263	-1.322	[-21.971, 54.399]	1.00
Very Low v. Middle	22.50	4.950	11.50	16.263	0.915	[-80.016, 102.016]	1.294

Research Question 4

As socioeconomic status decreased was there a statistical difference in the amount of price promotion tobacco point of sale advertising within a ½ mile radius of public high schools in the Tulsa Public Schools system? To answer this question multiple independent sample t -tests for significance was performed. Tests of the priori hypothesis were conducted using Bonferroni adjusted alpha levels of .017 per test (.05/3). The null hypothesis was as follows:

H₀: There is no significant difference in the amount of price promotion point of sale advertising means at convenience stores around public high school in the Tulsa Public Schools system based on socioeconomic status.

There were 3 independent sample *t*-tests performed; very low SES vs. low SES, low SES vs. middle SES, and very low SES vs. middle SES respectively. The first independent sample *t*-test showed that the difference in price promotion signage between very low SES ($n = 2, M = 8.50, SD = 0.707$) and low SES ($n = 7, M = 13.29, SD = 10.673$) were not statistically significant, $t(7) = -0.604, p = 0.565, 98.3\% \text{ CI } [-29.460, 19.889], d = -0.456581$. The second independent sample *t*-test showed that the difference in price promotion signage between low SES ($n = 7, M = 13.29, SD = 10.673$) and middle SES ($n = 2, M = 5.00, SD = 7.071$) were not statistically significant, $t(7) = 1.010, p = 0.346, 98.3\% \text{ CI } [-17.266, 33.838], d = 0.763488$. The third independent sample *t*-test showed that the difference in price promotion signage between very low SES ($n = 2, M = 8.50, SD = 0.707$) and middle SES ($n = 2, M = 5.00, SD = 7.071$) were not statistically significant, $t(2) = 0.697, p = 0.558, 98.3\% \text{ CI } [-34.546, 41.546], d = 0.985707$. Therefore, the null hypothesis must be retained. Statistical analysis outcomes for research question 4 are shown in Table 8.

Table 8. *Price Promotion Signage Descriptives*

	SES status		SES status		<i>t</i> (7)	98.3% CI	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Very Low v. Low	8.50	0.707	13.29	10.673	-0.604	[-29.460, 19.889]	-0.456581
Low v. Middle	13.29	10.673	5.00	7.071	1.010	[-17.266, 33.838]	0.763488
Very Low v. Middle	8.50	0.707	5.00	7.071	0.697	[-34.546, 41.546]	0.985707

Research Question 5

As socioeconomic status decreased was there a statistical difference in the amount of branding signage tobacco point of sale advertising within a ½ mile radius of public high schools

in the Tulsa Public Schools system? To answer this question multiple independent sample T-tests for significance was performed. Tests of the priori hypothesis were conducted using Bonferroni adjusted alpha levels of .017 per test (.05/3). The null hypothesis was as follows:

H₀: There is no significant difference in the amount of branding signage point of sale advertising means at convenience stores around public high school in the Tulsa Public Schools system based on socioeconomic status.

There were 3 independent sample *t*-tests performed; very low SES vs. low SES, low SES vs. middle SES, and very low SES vs. middle SES respectively. The first independent sample *t*-test showed that the difference in branding signage between very low SES ($n = 2$, $M = 22.50$, $SD = 2.121$) and low SES ($n = 7$, $M = 20.14$, $SD = 10.761$) were not statistically significant, $t(7) = 0.294$, $p = 0.777$, 98.3% CI [-22.594, 27.308], $d = 0.22224$. The second independent sample *t*-test showed that the difference in branding signage between low SES ($n = 7$, $M = 20.14$, $SD = 10.761$) and middle SES ($n = 2$, $M = 7.50$, $SD = 10.607$) were not statistically significant, $t(7) = 1.468$, $p = 0.185$, 98.3% CI [-14.166, 39.452], $d = 1.1097$. The third independent sample *t*-test showed that the difference in branding signage between very low SES ($n = 2$, $M = 22.50$, $SD = 2.121$) and middle SES ($n = 2$, $M = 7.50$, $SD = 10.607$) were not statistically significant, $t(2) = 1.961$, $p = 0.189$, 98.3% CI [-42.911, 72.911], $d = 2.77327$. Therefore, the null hypothesis must be retained. Statistical analysis outcomes for research question 5 are shown in Table 9.

Table 9. *Branding Signage Descriptives*

	SES status		SES status		<i>t</i> (7)	98.3% CI	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Very Low v. Low	22.50	2.121	20.14	10.761	0.294	[-22.594, 27.308]	-0.22224
Low v. Middle	20.14	10.761	7.50	10.607	1.468	[-14.166, 39.452]	1.1097
Very Low v. Middle	22.50	2.121	7.50	10.607	1.961	[-42.911, 72.911]	2.77327

Research Question 6

As socioeconomic status decreased was there a statistical difference in the amount of positive wording tobacco point of sale advertising within a ½ mile radius of public high schools in the Tulsa Public Schools system? To answer this question multiple independent sample T-tests for significance was performed. Tests of the priori hypothesis were conducted using Bonferroni adjusted alpha levels of .017 per test (.05/3). The null hypothesis was as follows:

H₀: There is no significant difference in the amount of positive wording point of sale advertising means at convenience stores around public high school in the Tulsa Public Schools system based on socioeconomic status.

There were 3 independent sample *t*-tests performed; very low SES vs. low SES, low SES vs. middle SES, and very low SES vs. middle SES respectively. The first independent sample *t*-test showed that the difference in positive wording signage between very low SES (*n* = 2, *M* = 10.00, *SD* = 0.00) and low SES (*n* = 7, *M* = 8.71, *SD* = 5.529) were not statistically significant, *t* (7) = 0.313, *p* = 0.763, 98.3% CI [-11.493, 14.064], *d* = 0.236606. The second independent sample *t*-test showed that the difference in positive wording signage between low SES (*n* = 7, *M* = 8.71, *SD* = 5.529) and middle SES (*n* = 2, *M* = 3.50, *SD* = 4.950) were not statistically

significant, $t(7) = 1.193$, $p = 0.272$, 98.3% CI [-8.391, 18.819], $d = 0.901823$. The third independent sample t -test showed that the difference in positive wording signage between very low SES ($n = 2$, $M = 10.00$, $SD = 0.00$) and middle SES ($n = 2$, $M = 3.50$, $SD = 4.950$) were not statistically significant, $t(2) = 1.857$, $p = 0.204$, 98.3% CI [-20.00, 33.00], $d = 2.62619$. Therefore, the null hypothesis must be retained. Statistical analysis outcomes for research question 6 are shown in Table 10.

Table 10. *Positive Wording Signage Descriptives*

	SES status		SES status		$t(7)$	98.3% CI	Cohen's d
	M	SD	M	SD			
Very Low v. Low	10.00	0.00	8.71	5.529	0.313	[-11.493, 14.064]	0.236606
Low v. Middle	8.71	5.529	3.50	4.950	1.193	[-8.391, 18.819]	0.901823
Very Low v. Middle	10.00	0.00	3.50	4.950	1.857	[-20.00, 33.00]	2.62619

Research Question 7

As socioeconomic status decreased was there a statistical difference in the amount of colorful tobacco point of sale advertising within a ½ mile radius of public high schools in the Tulsa Public Schools system? To answer this question multiple independent sample T-tests for significance was performed. Tests of the priori hypothesis were conducted using Bonferroni adjusted alpha levels of .017 per test (.05/3). The null hypothesis was as follows:

H₀: There is no significant difference in the amount of colorful point of sale advertising means at convenience stores around public high school in the Tulsa Public Schools system based on socioeconomic status.

There were 3 independent sample *t*-tests performed; very low SES vs. low SES, low SES vs. middle SES, and very low SES vs. middle SES respectively. The first independent sample *T* test showed that the difference in colorful signage between very low SES ($n = 2, M = 20.00, SD = 1.414$) and low SES ($n = 7, M = 20.71, SD = 11.441$) were not statistically significant, $t(7) = -0.084, p = 0.935, 98.3\% \text{ CI } [-27.190, 25.762], d = -0.063498$. The second independent sample *t*-test showed that the difference in colorful signage between low SES ($n = 7, M = 20.71, SD = 11.441$) and middle SES ($n = 2, M = 6.50, SD = 9.192$) were not statistically significant, $t(7) = 1.590, p = 0.156, 98.3\% \text{ CI } [-13.614, 42.042], d = 1.20193$. The third independent sample *t*-test showed that the difference in colorful signage between very low SES ($n = 2, M = 20.00, SD = 1.414$) and middle SES ($n = 2, M = 6.50, SD = 9.192$) were not statistically significant, $t(2) = 2.053, p = 0.177, 98.3\% \text{ CI } [-36.294, 63.294], d = 2.90338$. Therefore, the null hypothesis must be retained. Statistical analysis outcomes for research question 7 are shown in Table 11.

Table 11. *Colorful Signage Descriptives*

	Very Low SES		Low SES		<i>t</i> (7)	98.3% CI	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Very Low v. Low	20.00	1.414	20.71	11.441	-0.084	[-27.190, 25.762]	-0.063498
Low v. Middle	20.71	11.441	6.50	9.192	1.590	[-13.614, 42.042]	1.20193
Very Low v. Middle	20.00	1.414	6.50	9.192	2.053	[-36.294, 63.294]	2.90338

Research Question 8

As socioeconomic status decreased was there a statistical difference in the amount of Newport tobacco point of sale advertising within a ½ mile radius of public high schools in the Tulsa Public Schools system? To answer this question multiple independent sample *t*-tests for

significance was performed. Tests of the priori hypothesis were conducted using Bonferroni adjusted alpha levels of .017 per test (.05/3). The null hypothesis was as follows:

H₀: There is no significant difference in the amount of Newport point of sale advertising means at convenience stores around public high school in the Tulsa Public Schools system based on socioeconomic status.

There were 3 independent sample *t*-tests performed; very low SES vs. low SES, low SES vs. middle SES, and very low SES vs. middle SES respectively. The first independent sample *t*-test showed that the difference in Newport signage between very low SES ($n = 2$, $M = 13.50$, $SD = 2.121$) and low SES ($n = 7$, $M = 2.71$, $SD = 2.812$) was statistically significant, $t(7) = 4.939$, $p = 0.002$, 98.3% CI [3.987, 17.585], $d = 3.73353$. The second independent sample *t*-test showed that the difference in Newport signage between low SES ($n = 7$, $M = 2.71$, $SD = 2.812$) and middle SES ($n = 2$, $M = 1.50$, $SD = 2.121$) were not statistically significant, $t(7) = 0.556$, $p = 0.595$, 98.3% CI [-5.585, 8.013], $d = 0.420296$. The third independent sample *t*-test showed that the difference in Newport signage between very low SES ($n = 2$, $M = 13.50$, $SD = 2.121$) and middle SES ($n = 2$, $M = 1.50$, $SD = 2.121$) were not statistically significant, $t(2) = 5.657$, $p = 0.030$, 98.3% CI [-4.062, 28.062], $d = 8.00$. Therefore, the null hypothesis must be rejected as there is a significant difference in Newport point of sale advertising means at convenience stores of very low SES compared to low SES around public high school in the Tulsa Public Schools system based on socioeconomic status. Statistical analysis outcomes for research question 8 are shown in Table 12.

Tables 12. *Newport Signage Descriptives*

	SES status		SES status		<i>t</i> (7)	98.3% CI	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Very Low v. Low	13.50	2.121	2.71	2.812	4.939	[3.987, 17.585]	3.73353
Low v. Middle	2.71	2.812	1.50	2.121	0.556	[-5.585, 8.0413]	0.420296
Very Low v. Middle	13.50	2.121	1.50	2.121	5.657	[-4.062, 28.062]	8.00

Research Question 9

As socioeconomic status decreased was there a statistical difference in the amount of Marlboro tobacco point of sale advertising within a ½ mile radius of public high schools in the Tulsa Public Schools system? To answer this question multiple independent sample *t*-tests for significance was performed. Tests of the priori hypothesis were conducted using Bonferroni adjusted alpha levels of .017 per test (.05/3). The null hypothesis was as follows:

H₀: There is no significant difference in the amount of Marlboro point of sale advertising means at convenience stores around public high school in the Tulsa Public Schools system based on socioeconomic status.

There were 3 independent sample *t*-tests performed; very low SES vs. low SES, low SES vs. middle SES, and very low SES vs. middle SES respectively. The first independent sample *t*-test showed that the difference in Marlboro signage between very low SES (*n* = 2, *M* = 3.00, *SD* = 2.828) and low SES (*n* = 7, *M* = 9.00, *SD* = 7.853) were not statistically significant, *t* (7) = -1.018, *p* = 0.342, 98.3% CI [-24.344, 12.344], *d* = -0.769536. The second independent sample *t*-test showed that the difference in Marlboro signage between low SES (*n* = 7, *M* = 9.00, *SD* = 7.853) and middle SES (*n* = 2, *M* = 2.00, *SD* = 2.828) were not statistically significant, *t* (7) = 1.188, *p* =

0.274, 98.3% CI [-11.344, 25.344], $d = 0.898044$. The third independent sample t -test showed that the difference in Marlboro signage between very low SES ($n = 2$, $M = 3.00$, $SD = 2.828$) and middle SES ($n = 2$, $M = 2.00$, $SD = 2.828$) were not statistically significant, $t(2) = 0.354$, $p = 0.757$, 98.3% CI [-20.415, 22.415], $d = 0.500632$. Therefore, the null hypothesis must be retained. Statistical analysis outcomes for research question 9 are shown in Table 13.

Table 13. *Marlboro Signage Descriptives*

	SES status		SES status		$t(7)$	98.3% CI	Cohen's d
	M	SD	M	SD			
Very Low v. Low	3.00	2.828	9.00	7.853	-1.018	[-24.344, 12.344]	-0.769536
Low v. Middle	9.00	7.853	2.00	2.828	1.188	[-11.344, 25.344]	0.898044
Very Low v. Middle	3.00	2.828	2.00	2.828	0.354	[-20.415, 22.415]	0.500632

CHAPTER V

CONCLUSION

The purpose of this thesis was to examine any possible relationship between the amount of tobacco point of sale advertising in convenience stores within a ½ mile radius of public high schools in the Tulsa Public Schools district and the socioeconomic status of the student body and area of the school. The study focused on this possible relationship due to increased adolescent smoking susceptibility status post exposed to tobacco point of sale advertising, higher prevalence of current adolescent smoking at schools with more tobacco outlets within walking distance, and greater number of ads for tobacco products in lower income neighborhoods, neighborhoods with higher amounts of minorities, and adolescents (Bogdanovica, Szatkowski, McNeill, Spanopoulos, & Britton, 2015; Henriksen et al., 2008; Widome, Brock, Noble, & Forster, 2013). Through application of multiple independent sample *t*-tests for significance, using Bonferroni adjusted alpha levels of .017 per test (.05/3), found that convenience stores within the ½ mile radius of very low socioeconomic status high schools of Tulsa had significantly more Newport cigarette point of sale advertisements than those areas of low socioeconomic status. The study also found that convenience stores within a ½ mile radius of public high schools had on average approximately 28 cigarette advertisements regardless of socioeconomic status. The majority of tobacco advertisements were found inside the convenience stores. Depending on the socioeconomic area on average between 12 and 28 tobacco point of sale advertisements were

located inside convenience stores within a ½ mile radius of a high school. The amount of tobacco point of sale advertising occurring in these stores illustrates how the vast majority of adolescents could be becoming aware of tobacco use in their almost daily lives (Spanopoulos, Britton, McNeill, Ratschen, & Szatkowski, 2014; MacKintosh, Moodie, & Hastings, 2012; Paynter, Edwards, Schluter, & McDuff, 2009). Branding was also a common form of advertising that was found in the study. Depending on the socioeconomic status of the area convenience stores had on average between 20 and 23 tobacco branding advertisements. With such large amount of tobacco branding advertisements occurring, tobacco susceptibility among the Tulsa high school adolescent population could potentially increase. Colorful advertisements were also a frequent feature of the tobacco advertisements occurring at the point of sale. This colorfulness can potentially increase awareness of tobacco by adolescents especially if the adolescents find the advertisements catchy or attractive (MacKintosh, Moodie, & Hastings, 2012).

Implications

This thesis found that there are significantly higher levels of Newport cigarette advertising within the ½ mile radius of very low socioeconomic status high schools of Tulsa had significantly more Newport cigarette point of sale advertisements than those areas of low socioeconomic status. This is especially pertinent given two factors, the high level of menthol tobacco abuse among the adolescent population and the population demographics of the area. Currently the adolescent population abuses menthol tobacco products significantly more than young or middle aged adults (Nonnemaker et al., 2013). High school adolescents also smoke menthol cigarettes in greater numbers than non-menthol cigarettes and are less likely to quit smoking compared to non-menthol smoking adolescents (Azagba, Minarker, Sharaf, Hammond, & Manske, 2014). It was due to the disproportionate use of flavored cigarettes by the adolescent population that caused them to be banned in 2009, menthol cigarettes though were not classified

as being flavored even though menthol alters the taste of the tobacco (Family Smoking Prevention and Tobacco Control Act, 2009). The African American population also smokes menthol cigarettes at a higher percentage than other racial or ethnic groups (Muilenburg & Legge Jr., 2008). With School A having an African American student population over 60% the significantly higher amounts of Newport advertising around the school can potentially make these adolescents more susceptible to smoking from a variety of pathways including their age and race. This result is similar to previous research conducted within Oklahoma which found higher levels of menthol cigarette advertising in lower socioeconomic areas of Oklahoma City (Widome, Brock, Noble, & Forster, 2013).

This study illustrates how A.I.D.A. advertising theory is implemented with point of sale advertising that could potentially make Tulsa adolescents more susceptible to smoking initiation. There is wide, but not statistically significant, variation of colorful displays promotion tobacco in convenience store within a ½ mile of a TPS high school. Those areas of very low and low socioeconomic areas have on average about 20 colorful advertisements while middle socioeconomic areas only have 6.5. Adolescent awareness of tobacco in their daily lives can occur through visual stimuli and colorful attractive graphics. This tobacco awareness has been shown to increase tobacco susceptibility among the adolescent population (Spanopoulos, Britton, McNeill, Ratschen, & Szatkowski, 2014; MacKintosh, Moodie, & Hastings, 2012; Paynter, Edwards, Schluter, & McDuff, 2009).

Adolescent interest can also arise with the use of positive wording in tobacco point of sale advertising. Newport's use of the word "pleasure" and Marlboro's use of the word "bold" are prominent fixtures of their advertisements in the convenience stores included in this study. This positive wording could potentially be inferred as a promise of reward. There is also a substantial amount of branding advertising occurring at convenience stores. These results do vary but not

enough to be statistically significant. What is known though is that each additional brand that was recognized at the point of sale, the chances of becoming a regular smoker increased by 5 percent (Spanopoulos, Britton, McNeill, Ratschen, & Szatkowski, 2014). Since there are on average between 7.5 and 22.5 branding advertisements in convenience stores depending upon which socioeconomic area of Tulsa the store is located, there is ample opportunity for adolescents to become familiar with tobacco branding occurring at the point of sale.

Adolescent desire for tobacco products could occur through special offerings and discounts such as price promotions, which could manifest a sense of urgency. Depending on the socioeconomic area having on average between 5 and 13 price promotion advertising could potentially cause substantial desiring effect within the adolescent population. More qualitative research will need to be done in the area but what is known is that eliminating pricing promotions is recommended to reducing and prevention of smoking and lower cigarette prices promote their use (Henriksen, 2012).

This study adds to the knowledge of tobacco advertising practices. Specifically, it adds to the knowledge of practices within Oklahoma especially around schools in underprivileged urban areas. The study can be used as a baseline comparison or framework for additional studies relating to tobacco point of sale advertising.

Limitations

There were a number of limitations to this study. First, the study approach was quantitative observational and data was collected in a cross sectional manner. As with all cross-sectional research no causal effects can be drawn from the findings. Also, the amount of tobacco point of sale advertising noted in the study was only from one day. There is the possibility that advertising numbers fluctuate throughout the year or during specific points in time. The data set

was also limited to Tulsa Public Schools. This provides a data set for urban schools in northeast Oklahoma but there was no suburban, peri-urban, or rural high schools included in the study. Due to the urban demographics of Tulsa Public Schools there was also no high schools that could be defined as high socioeconomic. The urban environment around Tulsa could also be significantly different from other cities within Oklahoma or the surrounding Midwest region. There is also a limited number of high schools and convenience stores that were able to be included in this study. This limited number could cause a skewed effect in the statistical outcomes. A greater number of high schools and greater number of convenience stores could provide a better understanding of the amount of tobacco point of sale advertising occurring around schools.

Recommendations

Further research should be done concerning tobacco point of sale advertising relationship with the adolescent population, especially in Oklahoma. There are multiple possible research opportunities to continue investigating point of sale advertising effects. Comparative research between urban centers in Oklahoma should be done to investigate possible differences or lack thereof in tobacco advertising on the urban adolescent populations. This would also provide greater amount of high schools and convenience stores to include in statistical analysis which would provide more insight into the amount of tobacco point of sale advertising occurring around urban schools. Research should be expanded to include a larger subset of the high schools within the Tulsa area or throughout Oklahoma. This could include suburban, peri-urban, and rural high schools. Inclusion of high schools in areas of high socioeconomic status could also illustrate a clearer picture of differences in tobacco advertising in more affluent areas of Oklahoma. Additionally, further research can potentially include tobacco point of sale advertising around the middle school adolescent population. While this population does smoke less than high school age adolescents, currently 4.8% of Oklahoma middle school aged adolescents are regular smokers and

it would be a detriment to overlook the potential environmental cues that could increase smoking susceptibility of this young adolescent population (OSDH, 2015). This would allow for a greater understanding of tobacco point of sale advertising practices in different socioeconomic areas throughout the Tulsa metropolitan area or throughout Oklahoma as a whole. Continued research on potential influencing factors of smoking susceptibility on the Oklahoma adolescent population need to be further explored in an effort to bring about more effective preventions of adolescent smoking initiation within the state. Finally, research investigating the intrapersonal effects that tobacco point of sale advertising has on the Oklahoma adolescent population. This could provide insights into personal motivations that these advertisements have on the adolescent population which could be making Oklahoma teens more susceptible to smoking initiation. Further research should include the areas of advertising hypothesized in this study especially concerning the amount of Newport advertising as this hypothesis was found to be significant in this study. Continued research and intervention development is paramount given the high prevalence of tobacco abuse of the adolescent population within Oklahoma.

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APPENDICES

Data Collection Form

Store Name	
Location	
Date	
Time	
Total Outside Signage	
Total Inside Signage	
Total Signage	
Total Price Promotion (Special Price, Multi pack discounts, etc.)	
Total Branding	
Total Positive Wording (Pleasure, Bold, Special Blend, etc.)	
Total Colorful Advertisements	
Brands Advertised	
Marlboro	

Newport	
Winston	
Maverick	
Kool	
American Spirit	
Pall Mall	
Camel	
Echo	
Time	
Virginia Slim	
L&M	
Edgefield	

Table 14. *Tobacco Brands Advertised*

	Newport	Marlboro	Winston	Maverick	Kool	American Spirit	Pall Mall	Camel
Store 1	15	5	5	3	2	0	0	0
Store 2	12	1	0	0	0	0	5	4
Store 3	7	3	1	1	1	0	4	2
Store 4	0	3	0	0	0	0	0	0
Store 5	3	19	3	3	2	3	1	3
Store 6	0	2	0	1	0	0	1	2
Store 7	0	3	7	2	1	0	0	0
Store 8	5	17	2	1	1	2	2	3
Store 9	4	16	4	0	3	1	0	4
Store 10	3	4	0	0	0	2	2	3

	Echo	Time	L&M	Edgefield	Virginia Slim
Store 1	0	0	0	0	1
Store 2	0	0	0	0	0
Store 3	0	0	0	0	0
Store 4	0	0	0	0	0
Store 5	2	1	1	0	0
Store 6	1	0	0	3	0
Store 7	2	0	0	0	0
Store 8	0	0	0	0	0
Store 9	0	0	1	0	0
Store 10	0	0	1	0	0

Table 15. *Types of Signage*

	Pricing Promotion	Price	Branding	Menthol	Positive Wording	Colorful Advertisement
Store 1	8	11	24	10	10	21
Store 2	9	14	21	14	10	19
Store 3	11	14	18	10	7	19
Store 4	0	7	3	0	2	3
Store 5	16	33	29	7	14	30
Store 6	11	5	15	5	6	13
Store 7	2	14	14	5	3	15
Store 8	24	4	28	10	14	30
Store 9	29	2	34	13	15	35
Store 10	10	4	15	7	7	13
Total	120	108	392	81	88	198

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