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ABSTRACT

YOUTH ALCOHOL MARKETING EXPOSURE AND SEX RISK BEHAVIOR: A SOCIAL COGNITIVE PERSPECTIVE FROM UGANDA

By

VINITA SANGTANI

July 29, 2016

INTRODUCTION: Twenty four percent girls and 37.8% boys age 15-19 years were current drinkers of alcohol in Uganda in 2010 (World health organization (WHO), n.d.). Marketing of alcohol to youth in African countries, particularly Uganda, is very aggressive (DeBruijn, 2011). Consequences of this are reflected in the high consumption rates among this population. Given the high rates of HIV (4-10%), the sex risk behaviors exhibited by this population have been linked to alcohol consumption (Swahn, Ali, Palmier, Sikazwe, & Mayeya, 2011). More evidence is needed.

AIM: To demonstrate the effect of alcohol marketing exposure on alcohol consumption by adolescents in the slums of Kampala, Uganda, and the consequent effect on the number of sex partners they have.

METHODS: A mHealth survey was conducted among 12-18 year olds in the slums of Kampala, Uganda, in 2014. Regression analysis was used to test the hypothesized relationships.

RESULTS: Exposure to alcohol advertising on TV, print media, and outdoor advertising was positively related to the frequency of alcohol consumption. The relationship was mediated by cognitions favoring the advertising. Alcohol consumption in turn predicted the number of sex partners.

DISCUSSION: The double jeopardy of alcohol marketing effects on youth is demonstrated by confirming the strong positive effect on alcohol consumption, which in turn is related to sex with multiple partners. Implications for public policy and public health researchers are discussed and interventions are proposed.

YOUTH ALCOHOL MARKETING EXPOSURE AND SEX RISK BEHAVIOR: A
SOCIAL COGNITIVE PERSPECTIVE FROM UGANDA

by

VINITA SANGTANI

Ph.D., GEORGIA STATE UNIVERSITY

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of Georgia State University in Partial Fulfillment
of the
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MASTER OF PUBLIC HEALTH

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30303

APPROVAL PAGE

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Author's Statement Page

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Vinita Sangtani, Ph.D.

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Introduction

Nearly a third of adolescents in the United States (US) are said have tried alcohol before the age of 13 years and the age continues to decrease (Henriksen, Feighery, Schleicher, & Fortmann, 2008a). Twenty four percent girls and 37.8% boys age 15-19 years were current drinkers of alcohol in Uganda in 2010 (World health organization (WHO), n.d.). Globally, 5.9% of all deaths have been attributed to alcohol (WHO, 2015a), and in 2010, forty two percent youth between the ages of 15-19 worldwide were reported to be current drinkers of alcohol (WHO, n.d.). In general, alcohol consumption is directly related to the income level of the country, however, a diversity of factors such as religion, political stability, level of industrialization, and availability and acceptability of alcohol in Africa result in a wide variance in consumption levels by country (DeBruijn, 2011). Relative to developed nations, although African countries have lower per capita alcohol consumption rates as per WHO's Global Health Repository, the related burden of disease is disproportionately higher there (DeBruijn, 2011). A combination of factors such as poor self-regulation by the industry (Mart, 2011) and saturation of developed country markets make Africa subject to aggressive marketing by western alcohol marketers (DeBruijn, Ferreira-Borges, Engels, & Bhavsar, 2014; Obot, 2015). Availability of home cooked brews lends to make the situation graver (DeBruijn et al., 2014). Advertising portrays alcohol use as sophisticated, exciting, and associated with success and virility (see pictures in appendix 1) among other things, both in developed as well as less developed countries (DeBruijn, 2011; Parker, 1998). The difference lies in the regulation, where developed countries do not allow targeting youth, whereas laws in developing countries, if they exist, are not enforced (DeBruijn, 2011).

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Direct negative effects of alcohol, i.e., morbidity and mortality due to alcohol, have been well established in the medical literature (De Bellis et al., 2000; Rohde, Lewinsohn, & Seeley, 1996). The cost to society of indirect effects, ranging from poor academic performance, job absenteeism, interpersonal violence, and unintentional injuries to risky sexual behavior, are of equal or greater importance (DeBrujin, 2011; Hoffman, Pinkleton, Weintraub, Austin, & Reyes-Velázquez, 2014; McClure et al., 2016; Saffer & Dave, 2006). WHO reports that human immunodeficiency disease (HIV) related deaths are the second leading cause of death among youth, which according to the WHO, could be alleviated by controlling alcohol consumption (WHO, 2014b).

Since the 1970s, when citizen action groups and the Federal Trade Commission (FTC) began raising concerns about advertising to children, research on marketing to children gained traction (John, 1999). While there is consensus that youth drinking behavior is a worldwide health problem, inconclusive research findings continue to fuel the debate about the relationship between alcohol marketing and youth drinking behavior (Jones & Magee, 2011; Mastro & Atkin, 2002; Saffer & Dave, 2006). Ambiguous research findings for the effect of advertising on drinking behavior doesn't imply there is no effect, but that the effect might evade detection (Parker, 1998). Nevertheless, with the increased pace of research in the area, the evidence supporting the relationship is getting stronger (Morgenstern, Isensee, Sargent, & Hanewinkel, 2011). In the meantime, marketing of alcohol to youth continues to be rampant in the US and worldwide (Mart, 2011) and more evidence is needed to convince the alcohol marketing industry about the consequences (Morgenstern et al., 2011).

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The purpose of this study is to show, based on social cognitive theories, the relationship between alcohol marketing and consumption and how consumption further accounts for sex risk behaviors in an African context. In so doing, this study makes several contributions to existing literature – 1) it provides further evidence for the relationship between alcohol marketing exposure and alcohol consumption among youth. This is important because, as the literature suggests, earlier the initiation into alcohol, greater the consumption at a later age (Anderson, de Bruijn, Angus, Gordon, & Hastings, 2009). 2) It shows further that alcohol consumption is related to sex risk behavior among adolescents. Given the alarming prevalence of HIV worldwide, with Africa leading the way, it is important to put into place public policy and prevention interventions, if this link exists. 3) The model is tested in an African context. Most of the current research on the topic has been conducted in the developed west. There is a paucity of research related to the effects of alcohol marketing on African youth, whereas, given the disproportionately high burden of disease related to alcoholism in Africa, the topic is perhaps of greater importance to Africa at this time. 4) It answers calls for greater focus on youth health, in general. As the Assistant Director-General for Family, Women and Children’s Health, WHO points out, “The world has not paid enough attention to the health of adolescents” (“WHO calls for stronger focus on adolescent health,” 2014).

In the following, I start by reviewing the current literature on effect of alcohol on youth and alcohol marketing to youth, introduce my conceptual model, and discuss the related hypotheses. Description of the method is next, which is followed by the approach to analysis and presentation of results. Lastly, I discuss the research and its implications, propose some interventions, discuss study limitations, and conclude.

Literature review and conceptual model

Alcohol effects on youth:

Alcohol use at an early age has been linked to suicide ideation and attempts (Swahn & Bossarte, 2007; Swahn, Bossarte, & Sullivent, 2008). Being drunk before the age of 13 years was related to two times greater odds of having unplanned sex and 2.2 times greater odds of having unprotected sex (R. Hingson, Heeren, Winter, & Wechsler, 2003). Across multiple studies, Hingson, Heeren and their colleagues and Swahn and her colleagues have shown the adverse effects of alcohol on youth. Consistent with sociological and psychological research that adult cognitions and behavior are shaped by childhood learning and experiences (Ward, 1974), alcohol use at an early age has been shown to be related to problem drinking at later ages (F. Harris, Gordon, MacKintosh, & Hastings, 2015; R. Hingson, Heeren, Zakocs, Winter, & Wechsler, 2003; R. W. Hingson, Heeren, & Winter, 2006).

Alcohol marketing exposure effects:

Abundant literature illustrates the consequences and costs to society of alcohol marketing via the gamut of traditional media, which include, television (TV), radio, movies, billboards, direct mail, branded merchandise, and product placement in different entertainment media such as films, TV shows, and games (see review by Anderson et al., 2009; see also Saffer & Dave, 2006). Exposure of youth to alcohol marketing influences their decision to drink at a younger age, as early as seven years (Austin & Knaus, 2000), and has been related to problem drinking behavior (Swahn et al., 2011; Swahn, Palmier, & Kasirye, 2013). Anderson et al. (2009) identified 13 longitudinal studies that had followed 38,000 youth, for a period ranging between 8-96 months, and reported various

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levels of impact of different forms of exposure to advertising on alcohol consumption and age at initiation. Salient were results reported by Stacy et al. (2004), who correlated one standard deviation increase in alcohol advertising exposure with increase in the odds of consumption of beer by 44%, wine/ liquor by 34%, and of three or more drinks on one occasion in the past month.

Television advertising may have the greatest influence on adolescents (Churchill Jr. & Moschis, 1979; F. Harris et al., 2015), which may be because the frequency of exposure to alcohol advertising is highest on TV, with over 94% participants reporting exposure in a study by Jones & Magee (2011). Austin, Chen, & Grube, (2006) report that adolescents' favorable cognitions about portrayals in TV advertising increased identification with the portrayals. Morgenstern et al., (2011) showed a clear positive relationship between exposure to alcohol advertising on TV and consumption measured as: ever tried, current alcohol use, and binge drinking. Paying attention to and believing alcohol advertising were positively related to beer drinking among adolescents (Faria, Vendrame, Silva, & Pinsky, 2011).

After controlling for other demographic variables, (Wills, Sargent, Gibbons, Gerrard, & Stoolmiller, 2009) showed that exposure to alcohol in movies at an earlier age is correlated with increased alcohol use at a later age among adolescents. African American women exposed to outdoor alcohol advertising were 1.13 times more likely to consume alcohol than those unexposed (95% CI = 1.03 – 1.25). Jones & Magee (2011) found that advertising at the point of sale, specifically in bars and pubs, had a significant effect on consumption and initiation. The density of off-premise alcohol selling outlets also appears to influence initiation among adolescents, where off-premise outlets exclude

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bars, pubs, restaurants, and the like, in which alcohol can be consumed on premises (Chen, Grube, & Gruenewald, 2010).

Alcohol branded merchandize (ABM) has been found to have mixed impact on consumption, but has the potential to be very insidious for several reasons: 1) If advertising exposure has an effect because of the modeling behavior it induces, ABM makes it easy to try on the persona of a drinker (Henriksen et al., 2008a). 2) Ownership of ABM may be reflective of receptivity to alcohol marketing (see Stoolmiller et al., 2012). 3) ABM, for the most part, carries only the brand name or logo or picture of the product and not peripheral celebrity stimuli. Hence, as per the elaboration likelihood model, ABM exposure probably stimulates the central route to processing as opposed to the peripheral route (Cacioppo & Petty, 1984). In a cross-sectional study among 15-20 year old youth conducted by random-digit dialing, McClure et al. (2013) demonstrate that exposure to ABM was correlated with having a favorite alcohol brand, which in turn correlated with current binge drinking.

Social cognitive theories and advertising exposure:

According to Bandura (1977), modeling of observed behavior is integral to the learning process and enables assimilation of vast amounts of normative social and cultural behaviors that would otherwise be impossible to learn by a formal teaching process. Observational stimuli activate cognitions and alter a person's perception of the environment. Hence, there is a continuous reciprocal interaction between a person and the environment, which brings about learning.

Consistent with this, identities of adolescents are shaped by interaction with their environments (Bandura, 2006). Sociological theories suggest that being in the formative

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stage of life, youth are very impressionable and look outward, especially at public personalities, for guidance on establishing their self-identities and self-concept (Bandura, 1977; McClure et al., 2013). At the same time, youth are also being socialized as consumers, where consumer socialization has been defined as: “processes by which young people acquire skills, knowledge, and attitudes relevant to their functioning as consumers in the marketplace” (Ward, 1974, p. 2). Adolescents, according to John (1999), are in the reflective stage of consumer socialization; a time when they are developing cognitively and socially, and relative to younger children, have more advanced information processing and social skills. They understand the social significance of product categories and brand names; they learn that to achieve social goals they need to acquire certain brands and products, which become manifestations of their self-identities (John, 1999; Ward, 1974).

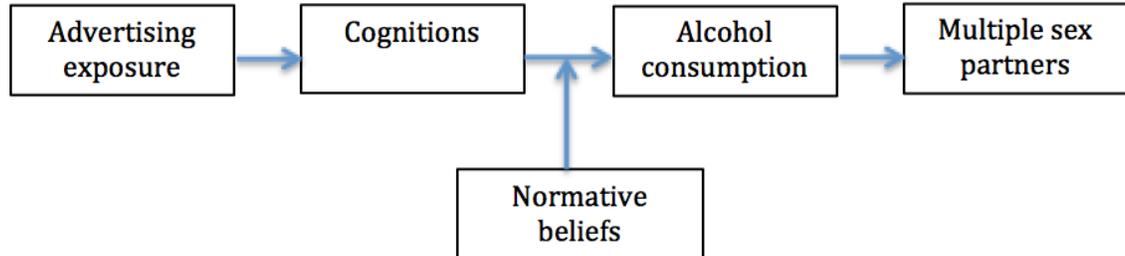
Advertising personalities on television and other media serve well to provide more than just the requisite product and brand knowledge (Churchill Jr. & Moschis, 1979). Being in developmental stages, both physically and mentally, adolescents are more susceptible to environmental influences such as advertising (Churchill Jr. & Moschis, 1979; Pasch, Komro, Perry, Hearst, & Farbaksh, 2007). Extensive literature, some of which has been discussed above, demonstrates the effects of alcohol marketing exposure on youth (Anderson et al., 2009; F. Harris et al., 2015; McClure et al., 2013). Fantasies such as success ascribed to alcohol, and myths such as beer being healthy and natural, portrayed by alcohol advertising are, especially for adolescents, ‘powerful and believable’ (Parker, 1998). The US, United Kingdom, and some other western nations have banned advertising of alcohol to children and have strict laws about what can be

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portrayed in alcohol advertising (F. Harris et al., 2015). Alcohol advertisements in less developed countries, however, particularly rely more on fantasy cues to render alcohol users as virile and successful in professional life and with women (DeBrujin, 2011). Exposure to such alcohol advertising elicits a larger number of favorable cognitions among adolescents (Mastro & Atkin, 2002; Pasch et al., 2007), “who construct a lifestyle representing their unique interpretations of the consumption ideals (Englis, Solomon, & Olofsson, 1993, p. 21). Based on this, with a specific focus on advertising (instead of all forms of marketing), the first hypothesis of the conceptual model (figure 1) is proposed as:

H₁: Exposure to alcohol advertising will be positively related to cognitions about alcohol advertising

Figure 1: Antecedents of alcohol use and multiple sex partners



Alcohol advertising related cognitions (cognitions), alcohol consumption, and the moderating role of normative beliefs:

Regarding adolescents, Bandura (1997) holds that they must prepare themselves for adulthood in many respects, including deciding on and planning their future work and social roles and goals, all the while going through biological and emotional changes, making it a very crucial and challenging phase in their lives. At this point they are involved with decisions that will chalk their life paths in terms of roles they would like to adopt and skills they will need to acquire.

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In most cases, functional families provide the stability for adolescents to transition smoothly through this phase (Bandura, 1977). Dysfunctional or impoverished families that may be characterized by conflict or substance abuse or other ills, do not provide the requisite support and stability critical to transition to adulthood, endangering the development of the adolescent into a productive citizen (Bandura, 1997). Having to concurrently deal with observable physical maturation requires external ratification of body image and self-identity. Impoverished situations, as in the slums of less developed countries, may not be conducive to development of a balanced self-identity. Friends and society fill the gap to become the sources of social-efficacy and role models for emotional and psychosocial development instead.

Furthermore, it has been well documented that peers play a crucial role in influencing teen behavior, especially when parental role models are unavailable (Churchill Jr. & Moschis, 1979; Gibbons et al., 2010). Media may serve up better role models for adolescents by portraying behavior that may be shied away from even in peer groups. An example was presented in Austin et al.'s (2006) study, which found that when parental guidance was low, identification with portrayals in TV advertising was greater among adolescents. It might appear that media influence is subtle and indirect, because advertising models cannot provide the alcohol, but it operates the same way as peer influence does (Gibbons et al., 2010). In addition, since outcomes, as modeled in advertising, are perceived as being valuable, the behavior is more easily embraced (Bandura, 1977). Messages in alcohol advertising are perceived as being 'personally salient' and meanings are derived therefrom and merged with the existing self-concept (Parker, 1998, p.107). As much as the product or brand message itself, characteristics

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assumed by models in advertising become coveted and emulated, becoming the self-identities of adolescents (Englis et al., 1993). Coupled with a tendency for youth to venture into dangerous and forbidden territory and egged on by peers, youth are driven to emulate and bring to life the fantasies they are exposed to in advertising. Hence, advertising related cognitions will be positively related to alcohol use among adolescents.

Some of the research discussed above also raises the question about the role of beliefs and norms in the development of an adolescent (see for example, Henriksen, Feighery, Schleicher, & Fortmann, 2008b; Pasch et al., 2007). The theories of reasoned action and planned behavior have held that normative beliefs are important precursors to behavior, especially in the context of substance use (McMillan & Conner, 2003). Normative beliefs, also referred to as subjective norms, measure subjective beliefs of a person about what important reference groups consider as appropriate behavior (McMillan & Conner, 2003). Subjective norms have been shown to predict 41% variance in intentions to drink (McMillan & Conner, 2003). Hoffman et al. (2014) argue that alcohol favoring norms have the ability to compound the effect of alcohol marketing exposure on drinking and that reinforcing positive norms should mitigate such effects. Hence, if favorable cognitions increase alcohol consumption, normative beliefs not in favor of alcohol should attenuate that effect, since they are held by important referents.

Accordingly, the following hypotheses are offered:

- H_{2a}: Alcohol advertising related cognitions (cognitions) will positively predict alcohol consumption
- H_{2b}: Normative beliefs will moderate the relationship between cognitions and alcohol consumption by weakening it.

Alcohol use and sex risk behavior:

Alcohol use has been commonly associated with risky sexual behaviors among adolescents, such as sex with multiple partners and unprotected sex, with consequential sexually transmitted diseases (STD), especially HIV (Kiene, Simbayi, Abrams, & Cloete, 2015; Mitchell, Beals, & Kaufman, 2006; Voisin, DiClemente, Salazar, Crosby, & L., 2006). The relationship between alcohol use and risky sexual behavior is of great interest because there is no known antibody against HIV; hence, until such time as one is found or developed, preventive behaviors may be the best cure (Mitchell et al., 2006). Public health literature shows evidence of a strong relationship between substance use and sex risk behaviors. For instance, female adolescents abusing substances during sexual encounters were more likely to have multiple sex partners (Millstein & Moscicki, 1995; Voisin et al., 2006). Being drunk before the age of 13 years was related to two times greater odds of having unplanned sex and 2.2 times greater odds of having unprotected sex (R. Hingson, Heeren, Winter, et al., 2003).

Steele & Josephs (1990) offer the alcohol myopia theory to explain the relationship; it argues that the influence of alcohol elicits conflict within a person between response to instigatory versus inhibitory cues. Seeking pleasure from sex with an available partner is the instigatory cue and desire for long-term health through avoidance of disease is the inhibitory cue. Under influence of alcohol, depending on the salience of the external cue, an example of which is partner characteristics, the internal inhibitory cue might be weakened or become distal and the instigatory cue strengthened or become proximal. Based on this discussion, the next hypothesis is proposed as follows:

H₃: Alcohol use behavior is positively related to risky sexual behavior, i.e., alcohol consumption will be positively related to having multiple sex partners.

Method

Context of the study:

Four sectors account for alcohol production in Africa – global corporations, national and regional industrial producers, local industrial producers, and non-industrial producers making traditional alcohols (Jernigan & Babor, 2015). Effects of alcohol consumption are especially pernicious in Africa because of the purity of alcohol sold by local industrial and non-industrial producers, which is commonly 40-60%; and binge drinking levels (defined as consumption of 60g of pure alcohol on one occasion) even at that purity are reported to be 46% among female drinkers and 59% among male drinkers. Unlike tobacco advertising, which is regulated, most countries, particularly developing ones, rely on self-regulation by the industry for alcohol marketing (DeBrujin et al., 2014; McClure et al., 2016; Swahn et al., 2013). Serious competition in the industry and loose regulations mean marketing efforts through every medium are ratcheted up, particularly by global producers (Jernigan & Babor, 2015).

In Africa, “Alcohol is portrayed as an emblem of success, and a symbol of heroism, courage and virility” (DeBrujin et al., 2014, p. 14). Extensive research by Swahn and her colleagues in several African countries shows the pervasiveness of outdoor advertising (Swahn et al., 2011, 2013), which is a very cogent medium for alcohol advertising in Africa and includes billboards, posters, flags, patio furniture, even soda bottle crates (DeBrujin et al., 2014). Daily exposure to these placed in proximity to schools exacerbates the power of the media to affect adolescents (Pasch et al., 2007), with 33% students recalling exposure to billboard advertising for alcohol in Zambia (Swahn et al., 2011).

The study

A cross-sectional survey was conducted in the spring of 2014 among 12-18 year old youth living in the slums or on the streets of Kampala, Uganda. The sample was drawn by convenience sampling at Uganda Youth Development Link (UYDEL) centers located in five of the biggest slums of Kampala. UYDEL is a non-government organization (NGO) providing various vocational training and preventive health services to an average of 650 disadvantaged youth per month. Participants were recruited from among and by word of mouth through youth who visit these UYDEL centers on a monthly basis from surrounding slums. Other than age, there were no exclusion criteria. In addition to commute expenses, if applicable, youth received snacks for participating in the survey. IRB approvals for the study were obtained from Georgia State University (GSU) and the Uganda National Council on Science and Technology. Participants had to first consent to the survey, which most of them did verbally. Parental consent had to be waived because most of these youth were street youth, who are responsible for their own livelihoods and are considered ‘emancipated’ in Uganda.

Social workers/ peer educators who had previous experience working with youth at the UYDEL centers were trained by a team of Georgia State University’s (GSU) School of Public Health (SPH) students and faculty to conduct the mHealth survey. mHealth refers to the use of mobile electronic devices in medical and public health services. Use of tablet devices for data collection ensured accuracy of data in three ways – 1) by accounting for the skip pattern and automatically prompting the interviewer with the right question order, 2) by not allowing the interviewer to change the question order, bias was avoided, and 3) by avoiding errors due to data entry. Training covered the study

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protocol, recruitment procedures, survey administration, and operation of tablet devices. A pilot test of the procedure was conducted by administering the survey on several youth present at the UYDEL center on that day, in presence of the GSU team. To further identify any residual methodological issues, the GSU and UYDEL teams later debriefed the interviewer and no issues surfaced. Upon completion of the day long training, these social workers recruited youth, obtained consent, and administered face-to-face surveys in Luganda, the local language, or in English. Each interview lasted about thirty minutes.

Of the 1628 youth who were approached for participation during the two-week survey, 131 declined and 1497 completed the survey for a response rate of 92%. Of these, 320 data points were lost due to technical issues in electronic transmission, for a final sample of 1134. In the final sample, 44% were girls and 56% were boys. Most (79.2%) were 15 years of age or older and 20.8% were between the ages of 12-14 years. Age distribution of the sample is in table 1. Figure 2 shows the frequency distribution of exposure to alcohol advertising through different media.

Measures:

Previously validated scales for measurement of exposure to alcohol marketing, assessment of alcohol consumption, and sex risk behaviors were used. Specifically, they were obtained from the Global School-based Student Health Survey (GSHS), USAID Survey, and AUDIT Questionnaire. Advertising exposure measured exposure to TV, print, and outdoor media on a 3 point scale as never, sometimes, often (table 2 details the measures); The cognitions scale, which was reverse coded to correspond with disagree = 1, neither agree nor disagree = 2, and agree = 3, measured the cognitions regarding alcohol advertising. Normative beliefs measured perceptions about alcohol consumption

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related beliefs of peers and parents on a 3 point Likert scale – agree, neither agree nor disagree, and disagree (1,2,3 respectively). Consumption of alcohol was measured as an absolute frequency: ‘In the past month, on how many days did you drink alcohol?’ (0 days, 1 or 2 days, 3-5 days, 6+ days). Multiple sex partners (risky sexual behavior) was measured as: ‘With how many different partners have you had sexual intercourse in the last 3 months?’ (none, 1-2 partners, 3-4 partners, 5-6 partners, more than 6 partners).

Analysis:

Measure validation:

Although the scales used in the survey have been well established in the literature, it is appropriate to test the psychometric properties (Churchill Jr., 1979). Reliabilities for the three multi-item scales exhibited adequate psychometric properties (table 3), with Cronbach’s α above the recommended threshold of .70 (Nunnally, 1978). Next, all scale items were subjected to principal component analysis with a Varimax rotation. Confirming discriminant and convergent validities, table 3 shows the resulting factor structure in which all items have substantial loadings on their intended factors and not on other factors.

When both dependent and independent measures are obtained from the same respondents using the same questionnaire, potential for common method bias (CMB) exists. A methodological step taken to avoid common method variance was to place constructs on the instrument in such a way that the predictor variable did not precede the criterion variables (Podsakoff et al., 2003). Absence of CMB was confirmed post hoc by exploratory factor analysis (EFA), which yielded a 3-factor solution accounting for 57% of the total variance, with each factor having an eigenvalue greater than 1, and the factor

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with the largest contribution to variance in the model (variance explained = 24.6%), accounted for less than half the sum total of the variance explained by all 3 factors (Menon et al., 1999, p. 31).

Results

Interpreting the CFA conducted by structural equation modeling using Lisrel 8.72 based on guidelines from Hu & Bentler (1999), the measurement model had good fit statistics with CFI = 0.94 ($\geq .95$), SRMR = 0.047 (< 0.09), Chi-square = 683.84 ($p = 0.0$) for 107 degrees of freedom. Every item had significant loadings on their respective factors confirming convergent validity, and discriminant validity was established at the same time since none of the items cross-loaded on other factors. An exploratory factor analysis using the principal component method with Varimax rotation also confirmed convergent and discriminant validities (table 3)

Summated variables were first created for each multi-item construct. Second, since the model included an interaction term, the constructs were mean centered in order to avoid multicollinearity (Baron & Kenny, 1986). Next, a series of regressions was run to test the conceptual model in SPSS. First, cognitions was regressed on advertising exposure to obtain a significant regression coefficient of 0.245, $p < 0.0$ in support of H₁ (table 4). Cognitions were hypothesized to predict alcohol consumption in H_{2a}; a beta coefficient of 0.365, $p < 0.0$ indicated support. Although mediation was not explicitly hypothesized, the model implied that cognitions mediate the relationship between advertising exposure and alcohol consumption. Baron & Kenny's (1986) four step procedure was followed to test the mediation. First, alcohol consumption was regressed on advertising exposure; the resulting regression coefficient of 0.339, $p < 0.01$ supported

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the relationship. The test for H_1 above is the second and H_{2a} the third step in the mediation test. Lastly, alcohol consumption was regressed on advertising exposure controlling for cognitions. In support of the mediation, the relationship between advertising exposure and alcohol consumption was weakened in presence of cognitions. Since social phenomena have more than one explanation, the expectation should be for the coefficient to be weakened rather than reduced to zero (Baron & Kenny, 1986). The regression coefficient between advertising exposure and alcohol consumption, which was originally 0.339, $p < 0.01$ was weakened to 2.89, $p < 0.01$. As per recommended procedure, the Sobel test was conducted to confirm this finding. A Sobel coefficient of 2.89, $p < 0.01$ supports mediation of the advertising exposure to alcohol consumption relationship by cognitions.

H_{2b} proposed that normative beliefs would moderate the relationship between cognitions and alcohol consumption. To test this moderation, an interaction term was first created as a product of cognitions and normative beliefs; following this, alcohol consumption was regressed on the interaction term while controlling for cognitions, normative beliefs, and exposure to advertising. As shown in table 4, the interaction was significant with a negative coefficient, supporting the hypothesis that normative beliefs of peers and parents not in favor of alcohol attenuate the relationship between cognitions and alcohol consumption ($b = -0.311$, $p < 0.05$). Lastly, H_3 proposed that alcohol consumption would be positively correlated with multiple sex partners. A beta coefficient of 0.208, $p < 0.01$ supported this final hypothesis. Following Aiken & West (1991), the conditional effect of cognitions on alcohol consumption at high and low levels of normative beliefs was examined by adding and subtracting a standard deviation from the

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mean centered normative belief scores and assessing the impact of the standardized regression coefficient associated with cognitions one standard deviation above and below the mean. Figure 3 confirms support for the interaction.

Once again, the model implied that alcohol consumption mediates the relationship between cognitions and multiple sex partners (MSP). Following the earlier described four step procedure, in the first step, the coefficient of the regression of MSP on cognitions was 0.268, $p < 0.0$ (table 5); step 2 tested in H_{2a} yielded a regression coefficient of 0.365, $p < 0.0$; in step 3, MSP was regressed on consumption to obtain a beta of 0.26, $p < 0.0$. In the last step, the regression of MSP on cognitions while controlling for the interaction between cognitions and normative beliefs, normative beliefs, and alcohol consumption resulted in a non-significant regression coefficient of 0.193, in support of the mediation.

Discussion

This study was an attempt to advance knowledge about the effect of exposure of youth to alcohol marketing on their alcohol consumption patterns and their consequent sex risk behavior. By demonstrating the effect of exposure to alcohol advertising on consumption and consequent sex with multiple partners in a comprehensive nomological network, this research illustrates the double jeopardy of alcohol marketing effects on youth. This is one of the few studies in public health literature to demonstrate the two step effects – effect of advertising exposure on consumption in the first step and the further consequence of alcohol consumption by youth on their sex risk behaviors in the second step. The following discussion highlights the implications of both these major contributions for theory and practice of public health.

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Although extensive extant research has found support for the negative effects of exposure to alcohol marketing on youth, for instance, it has been related to drinking at an early age and problem drinking behavior, and possible sex risk behaviors (Swahn et al., 2011), an almost equal amount of research with mixed support has given the alcohol marketing industry an excuse to continue targeting youth. In an African context, this study found an unambiguously strong correlation between exposure of adolescents to alcohol advertising and alcohol consumption, mediated by cognitions favoring the fantasies portrayed in alcohol advertising. Higher frequency of exposure to alcohol advertising in three different media: TV, print media, and outdoor advertising resulted in a greater number of cognitions favoring such advertising.

Favorable cognitions were found to increase the frequency of alcohol consumption by adolescents. Alcohol consumption in itself is very harmful to youth in a number of ways, including leading to cognitive impairment resulting in poor academic performance, getting into fights, and accidental injuries (DeBruijn, 2011; McClure et al., 2013; Saffer & Dave, 2006). An important contribution of this research is to show the role of normative beliefs, which attenuate the relationship between cognitions and alcohol consumption. This finding can be used to advantage in interventions as discussed later.

Direct cognitive developmental risks to youth of alcoholism are compounded by sex risk behaviors due to inebriation. Alcohol use was related to sex with multiple partners, probably accounting for the high rate of HIV among these youth, which, as per UYDEL records, was at 10.2%. As long as there is no cure for HIV, the most serious consequence of risky sexual behavior, it is incumbent upon society to prevent these behaviors (Mitchell et al., 2006) and on policy makers to understand the mechanisms

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influencing the decision processes of adolescents to engage in sex with multiple partners via alcohol consumption, on being exposed to alcohol marketing.

Effects demonstrated in this study are based on traditional marketing media. Although we don't test the effect of exposure to new media, which range from online videos, virtual reality websites, online games and contests to viral social media strategies and mobile media (Hoffman et al., 2014; A. C. McClure et al., 2016), the importance of the topic is elevated due to several reasons that make these media potent and worth discussing here to guide future research: the interactive nature of the media requiring action on the part of the exposed, the inability to distinguish between brand and consumer generated content on these media (McClure et al., 2016), the viral nature of the media resulting in ease of broadcasting ones' feats, and over 96% of college students being active on social media (Hoffman et al., 2014). Measuring receptivity to alcohol marketing on internet media, for example, McClure et al. (2016) longitudinally show that underage youth (<21 years) who were not binge drinkers at baseline and were more receptive to alcohol marketing messages on the internet were 2.15 times more likely to start binge drinking. Social media use explained 7% of the variance in problem drinking behavior and 6% variance in frequency of alcohol use among undergraduate students in the US, after controlling for demographic variables (Hoffman et al., 2014). Exposure to alcohol advertising through Internet media has been shown to have an effect on both genders. Males 12-15 years of age were 3.05 times more likely to have consumed alcohol in the last four weeks and females were 1.73 times more likely to report initiation into drinking alcohol compared to those unexposed.

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The World Health Organization (WHO) has recognized the need to stop targeting adolescents with alcohol marketing (WHO, 2014a) and reducing youth access to alcohol (WHO, 2015b). Even though the same mass media have been successfully used in interventions to prevent risky behaviors associated with alcohol abuse (Romer et al., 2009) and otherwise (Kerr et al., 2015) more needs to be done by way of regulation to protect youth and prevent exposing them to untoward influences at an impressionable age. Although this study was conducted in Africa, it is of public policy concern to US policy makers because western country alcohol manufacturers are as aggressive, if not more so, in targeting youth in Africa. Billboards and television advertising portray good-looking youth as being champions by drinking alcohol (see pictures in appendix 1). Aggressive marketing by western companies makes it easy for African producers to sell their own product, which is easy for this vulnerable population to access and, at over 40% purity, can be lethal for children and youth. The United Kingdom (UK) and US have banned direct advertising of alcohol to children (F. Harris et al., 2015) but it doesn't prevent marketers from advertising to children in other parts of the world.

In addition to lobbying policy makers, public health practitioners can contribute by increasing health promotion efforts in less developed countries, particularly in Africa. Health promotion efforts should be focused on educating youth in schools about the harmful effects of alcohol and about the risks of sex with multiple partners. A finding of this study that can be used to advantage in an intervention is the role of normative beliefs in attenuating the cognition – consumption relationship. Educational messages can counter the fantasies of alcohol advertising by highlighting the beliefs of important reference groups about alcohol consumption.

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In the US, some county health departments and non-profit organizations address the inherent risk taking and thrill seeking tendencies of bisexual men and African American men who have sex with men (MSM) by conducting group sessions followed by booster sessions to educate and empower – a program called Men of African American Legacy Empowering Self (MAALES) (Harawa et al., 2013). Akin to this, an intervention that has been used is peer counseling and leadership training (PCLT) to strengthen self-esteem and perceived self-control among substance dependent women (R. M. Harris, Bausell, Scott, Hetherington, & Kavanagh, 1998). Similar sessions can be held by NGOs such as UYDEL to educate youth about the risks of alcohol consumption and unsafe sex.

An intervention that has been successfully implemented in certain parts of the world, and is easily replicable, is the promotion of safer sex and distribution of free condoms through barbershops, alcohol, and tobacco outlets (Raman, 1992). One of the promotion methods in this successful campaign was an advertising display contest (Yadav, 1978), which can be run among alcohol outlets that agree to carry educational advertisements about safer sex and free condoms.

Limitations:

Some inherent and some unexpected limitations restrict the generalizability of the findings of this research. Three hundred and twenty observations were lost due to a technical glitch in the electronic transmission of data. Although surveys were conducted in private, they were administered by an interviewer, which might have given rise to social desirability bias, privacy concerns, and embarrassment (Kalichman, Simbayi, Jooste, & Cain, 2007). This could have biased the responses to either inflate or underreport alcohol use and sex with multiple partners. In future, the Marlowe Crowne

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Social Desirability Scale (SDS) could be used to control for potential SD bias associated with illegal and stigmatized behaviors, such as, substance abuse (Wright, Squires, Goodness, Maisto, & Palfai, 2013). Due to the private nature of the topic, scales were subjective, relying on participant recall of events. Participants might not accurately recall the number of events being measured in the study, such as the frequency of exposure to marketing or alcohol consumption or number of sex partners. Some study participants were youth receiving services at UYDEL and others were their friends or acquaintances, raising questions about external validity.

Conclusions:

Adding to the body of knowledge on marketing of alcohol to adolescents and its ramifications, this research goes further by demonstrating the link between alcohol use among adolescents and their risky sexual behavior of sex with multiple partners. The strong results obtained in this study are a valuable contribution to making the case for the alcohol marketing industry to stop targeting adolescents and for law makers to institute policy that would prevent US alcohol marketers from targeting youth in less developed countries with lax regulations.

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Table 1: Percentage distribution of sample by gender and age

Age	Gender		Total
	Male	Female	
12 years	2.3	1.9	4.1
13 years	3.4	3.0	6.4
14 years	4.2	6.2	10.4
15 years	4.6	7.4	12.0
16 years	5.6	8.5	14.1
17 years	9.9	12.5	22.4
18 years	13.9	16.7	30.5
	43.9	56.1	100.0

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Figure 2: Frequency of exposure to alcohol advertising through various media

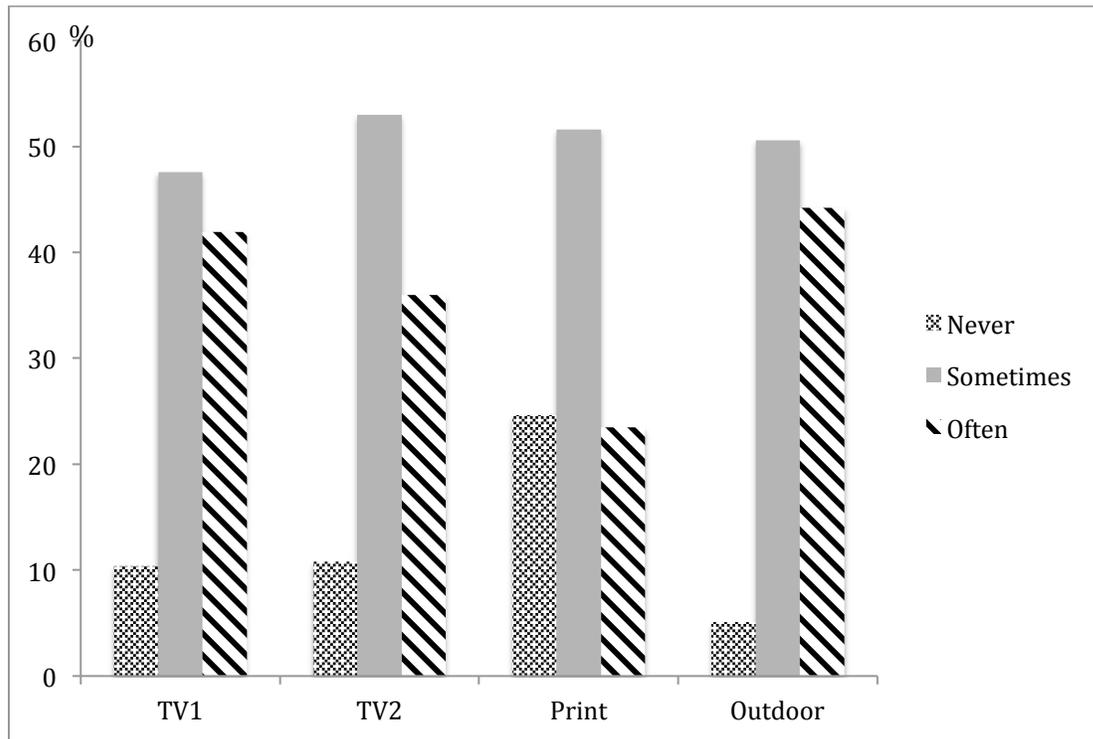


Table 2: Measures

Construct	Measure	Scale
Exposure 1	When you watched TV, how often did you see actors drinking alcohol?	Never, sometimes, often
Exposure 2	When you watched TV, how often did you see alcohol brand names?	
Exposure 3	When you look at magazines or newspapers, how often do you see advertisements or promotions for alcohol?	
Exposure 4	When you get around Kampala, how often do you see advertisements for alcohol?	
	What do you think about the following?	Agree, neither agree nor disagree, disagree
Normative beliefs 1	Most of my friends do not plan to drink alcohol until they are older	
Normative beliefs 2	Most of my friends think I should not drink alcohol	
Normative beliefs 3	Most adults I know discourage people my age from drinking alcohol	
Normative beliefs 4	My parents would be upset if they found out that I'm drinking alcohol	
	What do you think about the following?	Agree, neither agree nor disagree, disagree
Cognitions 1	I want to have as many friends as the people in the beers ads do	
Cognitions 2	I want to have as much fun as the people in the beer adverts	
Cognitions 3	I wish I were as good looking as most people in the beer adverts	
Cognitions 4	People in alcohol adverts look like they make good decisions while drinking	
Cognitions 5	People drinking beer in adverts seem to have lots of friends	
Cognitions 6	The women in alcohol adverts are always good looking	

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Table 3: Varimax rotated component matrix

Items	Factors		
	Cognitions $\alpha = 0.86$	Exposure $\alpha = 0.73$	Beliefs $\alpha = 0.7$
Exposure 1	0.13	0.809	-0.046
Exposure 2	0.04	0.855	-0.062
Exposure 3	-0.02	0.642	0.012
Exposure 4	0.088	0.638	-0.088
Belief 1	-0.17	-0.086	0.656
Belief 2	-0.174	-0.117	0.758
Belief 3	-0.068	-0.012	0.719
Belief 4	-0.083	0.022	0.722
Cognitions 1	0.769	0.119	-0.281
Cognitions 2	0.799	0.098	-0.263
Cognitions 3	0.796	0.079	-0.059
Cognitions 4	0.692	-0.085	-0.159
Cognitions 5	0.731	-0.022	-0.067
Cognitions 6	0.683	0.179	0.023

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Table 4: Results of regression analyses

Independent variable(s)	Dependent variable	Hypothesis	Unstandardized coefficient	R ²	F
Exposure to advertising	Cognitions	H ₁	0.245***	0.028	33.14***
Cognitions	Alcohol consumption	H _{2a}	0.365***	0.039	13.88***
Exposure to advertising	Alcohol consumption	Mediation	0.339**	0.028	9.89**
Exposure to advertising	Alcohol consumption	Mediation	0.289**	0.059	10.69***
Cognitions	Alcohol consumption				
Exposure to advertising			0.267**		
Cognitions			0.354**		
Normative beliefs (NB)			-0.688***		
Cognitions*NB	Alcohol consumption	H _{2b}	-0.311*	0.19	19.93***
Exposure to advertising			0.319**		
Cognitions			0.158		
Normative beliefs (NB)			-0.1		
Cognitions*NB			-0.049		
Alcohol consumption	Multiple sex partners	H ₃	0.208**	0.09	5.69***
* p<0.05, ** p<0.01, ***p<0.000					

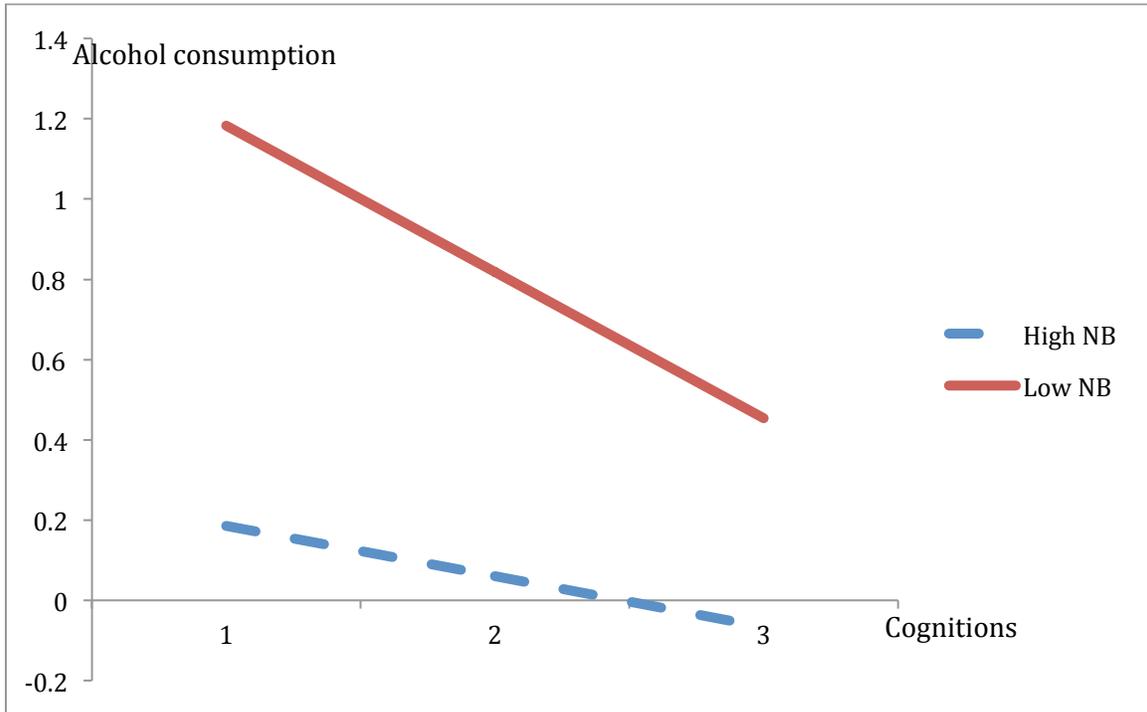
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Table 5: Mediation of cognitions to multiple sex partners link by alcohol consumption

Independent variable(s)	Dependent variable	Unstandardized coefficient	R ²	F
Cognitions	Multiple sex partners	0.268***	0.041	25.02***
Cognitions	Alcohol consumption	0.365***	0.039	13.88***
Alcohol consumption	Multiple sex partners	0.26***	0.059	18.34***
Cognitions	Multiple sex partners	0.193 ^{n.s.}	0.069	5.31***
Alcohol consumption				
Normative beliefs (NB)				
Cognitions*NB				
***p<0.000, n.s.: not significant				

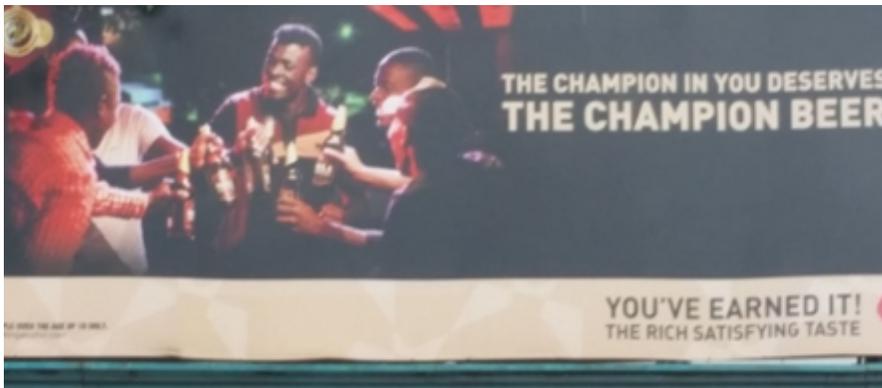
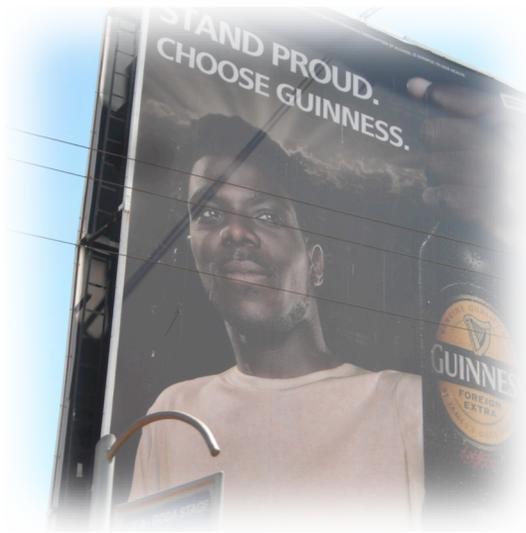
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Figure 3: Interaction between cognitions and normative beliefs (NB)



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Appendix 1: Examples of Billboard and Other Outdoor Advertising Targeting Youth from Uganda, Africa.



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