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Perceived harm as a mediator of the relationship between social norms and marijuana use and related consequences among American Indian youth



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ABSTRACT

Background: American Indian (AI) youth are at increased risk for marijuana use with marijuana use rates on or near reservations 1.6–4.8 times higher compared to non-AI youth in the same regions (Stanley et al., 2014). One outcome of the changing social and legal acceptance of marijuana is a decrease in perceived risk among adolescents. It is unknown whether these changes in perceptions of marijuana-related harm will presage higher rates of use among AI youth. Perceptions of others use (i.e., descriptive norms) and approval (i.e., injunctive norms) are consistent predictors of marijuana use and consequences. Moreover, large scale surveys have shown that gender is an important moderator of the relationship between norms and marijuana use in AI samples.

Method: The current study is a large epidemiologic study of 7th–12th grade self-identified American Indian students (N = 3050). We examined the direct relations between descriptive and injunctive norms and marijuana use/consequences among AI youth, as well as the mediating role of perceived harm and the moderating role of gender.

Results: Results of a multi-group path analysis revealed a similar pattern of findings for males and females. In addition, there were direct effects for descriptive but not injunctive norms on marijuana use/consequences, and the sequential pathway from norms to use/consequences via perceived harm held.

Discussion: Findings suggest that normative perceptions and perceived harm are antecedents of marijuana use/consequences and are prime targets for large scale interventions on AI reservations.

1. Introduction

Large scale survey studies report that American Indian (AI) adolescents who reside on reservations are at exceptionally high risk for marijuana use where rates of marijuana use can be from 1.6 to 4.8 times higher for last month use compared to white students residing in the same locations (Stanley et al., 2014). When comparing U.S. students in general to AI students, Johnston et al. (2016) found that 16.4% of 8th graders in the general population reported using marijuana, while Stanley et al. (2017) found that 56.2% of AI 8th graders reported using marijuana. Throughout high school, the gap between AI and general population youth decreased with regard to marijuana use, but remained pronounced with 43.8% of 12th grade general population youth reporting marijuana use and 67.9% of 12th grade AI youth reporting marijuana use. These substantially higher rates of use on or near reservations make AI youth vulnerable to the many harmful outcomes related to the use of marijuana.

In 2017, the National Academy of Sciences conducted a comprehensive review of the health effects of marijuana (NAS, 2017). This

group found evidence for a myriad of negative consequences including worsening respiratory symptoms (e.g., chronic cough, bronchitis), dependence on cannabis and other substances, and increased risk for developing social anxiety, schizophrenia or other psychoses (NAS, 2017). Further, NAS reported that impairments in learning, memory, and attention, as well as increased risk of motor vehicle accidents when driving under the influence result from acute intoxication. Similar consequences are reported for AIs, including progression to use of other drugs, substance use disorders, and anti-social behaviors (Ehlers et al., 2007; Novins and Barón, 2004; Novins and Mitchell, 1998; O'Connell et al., 2011). However, of note, Gilde et al. (2006) found no relationship of marijuana dependence to anxiety, affective, and psychotic disorders among a sample of Southwest California American Indian adults, suggesting there may be tribal variation for these relations. Together, the high prevalence and deleterious effects of excessive marijuana use among AI and general population youth highlight the need to understand the distal and proximal antecedents of problematic use.

The legal and social acceptance of marijuana use are changing despite its known negative consequences that can result from marijuana

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use. Among adolescents, substantial reductions in the perceived harmfulness of marijuana were reported by national 12th graders in 2015 (Johnston et al., 2016). The reduction in perceived harm among adolescents has been seen as a leading indicator of rises in use one or two years later (Johnston et al., 2016). Further, Berg et al. (2015) found among a large sample of college students that compared to various tobacco products, marijuana was viewed as the least harmful and most socially acceptable substance. While perceived harms associated with marijuana use are declining, it is unknown whether these changes will presage higher rates of use among AI youth, who already use at higher rates than the general population.

One lens through which to view higher rates of use among AI youth is social norms. Social norms are decisional shortcuts that guide decision making. Cialdini et al. (1991) define two types of social norms that define beliefs about how much others are engaging in a behavior (i.e., Descriptive Norms) and beliefs about others approval of engaging in a behavior (i.e., Injunctive Norms). Each of these factors has been reported to operate independently and directly on substance use (Borsari and Carey, 2003; Larimer et al., 2004; Lee et al., 2007). Other studies have found that norms related to marijuana use were associated not only with levels of use, but with marijuana-related problems (Neighbors et al., 2008; Kilmer et al., 2006). Regarding AI youth, Swaim et al. (2013) showed that AI youth reported higher descriptive norms and lower injunctive norms about marijuana use compared to non-AI youth residing in the same locations. While to some degree these normative perceptions match the prevalence rates reported in epidemiology studies, these perceptions may create a positive feedback loop with beliefs about higher prevalence of use and greater acceptability of use fueling higher rates of personal use. Indeed, Stanley et al. (2017) reported that descriptive and injunctive (disapproval) norms each related directly to lifetime, current, and heavy marijuana use among reservation AI youth. One benefit of the stable link between social norms and substance use and consequences is that social norms are amenable to intervention (Kilmer et al., 2006; Spoth et al., 2008). Examining the pattern of relationships between descriptive and injunctive norms among AI youth will help best design social norms campaigns to be delivered on or near reservations.

Appropriately targeting interventions involves understanding important moderators of the relationships between key antecedents and use. Gender has been identified as an important moderator in the substance use field with males typically using more substances than females. Specifically related to marijuana use, males have higher prevalence, rate, and frequency of marijuana use during adolescence (Johnston et al., 2014; SAMSHA, 2013; Crane et al., 2015), and females increase marijuana use during young adulthood resulting in gender differences in marijuana use being diminished by adulthood (Mahalik et al., 2013). Further, males report more marijuana-related consequences compared to females (Ecker and Buckner, 2014). There are also known gender differences in marijuana social norms. Adolescent females (both AI and non-AI) report higher descriptive norms compared to males. Among adolescents, 8th grade males report higher injunctive norms and 12th grade females report higher injunctive norms. There is currently no research on potential gender differences in perceived harm of marijuana.

The current study expands our investigation of marijuana and norms with an elaborated model that includes perceived harm as a potential mediator of both descriptive and injunctive norms and both marijuana user status and marijuana-related consequences (see Fig. 1). While perceived harm of marijuana use may be shifting, i.e., seen as less risky among adolescents, it remains a prevention target amenable to change and its role in relation to norms is important. Whether it operates as an indirect influence between norms and marijuana use and consequences is an important question to be answered. Further, gender is treated as a moderating variable of the mediational model described above. We are aware of no study that considers the potential interaction between gender, perceived harm, and social norms in AI youth. Parsai

et al. (2009) found that among Mexican and Mexican-American adolescents, the effects of parental injunctive norms and peer and friend descriptive norms for marijuana were stronger for male compared to female students. Moreover, the trend toward a lowering of perceived harm for marijuana use among adolescents (Johnston et al., 2016) makes this factor potentially key in understanding how social norms impact use. As described earlier, substance use consequences have been studied previously in the general population, but no study to date has examined both perceived harm and marijuana-related consequences within a single model, or among AI adolescents. Based on the foregoing review of past literature, we studied the following hypotheses:

H₁. Student beliefs about others' marijuana use (Descriptive Norms) and student perceptions of acceptability of marijuana use (Injunctive Norms) will be related to marijuana user status and marijuana-related consequences.

H₂. The effects of normative beliefs (Descriptive and Injunctive) on marijuana user status and marijuana-related consequences will be indirectly related through the effects of perceived harm.

H₃. The effects in H₂ will be moderated by gender.

2. Method

2.1. Sample and participants

This study uses survey data from 3050 7th to 12th grade self-identified American-Indian students (49.5% female) in 46 schools surveyed across four academic years (2009–2012). These data are part of an ongoing epidemiologic study of AI youth living on or near reservations. Schools on or near reservations with at least 20% AI students enrolled were identified and stratified according to six geographic regions (Northwest, Northern Plains, Northeast, Southeast, Southern Great Plains, and Southwest). Schools within this sampling frame were then sampled, with recruitment in each region approximating the percentage of AIs in that region based on 2000 U.S. Census data for designated AI areas. When a sampled school declined to participate, another school from that region was drawn. Depending on the year, approximately 20–40% of schools sampled agreed to participate, and on average, 80% of enrolled students (with a range of 66%–100%) took the survey. No schools in the Northeast chose to participate in the survey; however, only about 3% of American Indians living on reservations or tribal lands reside in this region. The Southwest and the Northern Plains have the greatest numbers of AIs living on reservations and tribal lands, relative to the other regions. The current sample included the following regional distribution of students: Northwest 3.3%, Northern Plains 51%, Southeast 3.6%, Southwest 30.7%, Upper Great Lakes 11.4%.

Specific identities of tribes and reservations are kept confidential. However, 60% of schools were located in areas where the poverty level was more than twice the national rate and where the median household income was less than 60% of the national level. Schools received a comprehensive report of findings and \$500 compensation for participating.

2.2. Procedure

Permission for surveying was obtained prior to data collection from tribal authorities and/or the school board. All students in grades 7–12 in sampled schools were eligible for participation in the survey. Passive parental consent was obtained as parents were notified of survey administration via a media release and a letter mailed to all parents by the school that explained how to opt their child out of the survey. Fewer than one percent of students did not complete the survey due to lack of parental consent. The survey was administered during normal classroom hours by either a teacher or school staff member trained in human

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