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Racing with friends: Resistance to peer influence, gist and specific risk beliefs

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ABSTRACT

Purpose: Studies assessing young drivers' risk appraisals with their driving behavior have shown both positive and inverse associations, possibly due to differences in survey items that cue *gist appraisals* about risk (i.e., beliefs that are focused on meaning) or *specific appraisals* (i.e., beliefs that are focused on discrete instances). Prior research has indicated that gist-based reasoning is protective against engaging in risk behavior and that use of gist appraisals increases with development. Additionally, although much of adolescents' risk-taking occurs in groups, almost no research examines how adolescents' resistance to peer influence may relate to their specific and gist beliefs about socially-bound risk behavior, as well as their future engagement in such behavior.
Methods: One hundred and thirty-two adolescent drivers participated in a prospective self-report study on racing behavior. Surveys measured specific and gist risk appraisals, resistance to peer influence, and racing behavior at two time points three months apart. We hypothesized that stronger specific appraisals would be associated with greater likelihood of racing, and stronger gist appraisals would be protective. Further, we hypothesized that resistance to peer influence would be positively associated with gist appraisals and negatively associated with specific risk appraisals; and would also be inversely associate with racing.
Results: Specific risk appraisals and gist appraisals were predictive of racing behavior as hypothesized. Resistance to peer influence did not predict racing, but was associated with each type of risk appraisal as predicted at Time 1, although the association between specific risk and resistance to peer influence was non-significant at the second time point.
Conclusions: Gist beliefs and the ability to resist influence from friends might be indicative of an underlying strength of one's own beliefs about the self as a non-risk taking person who stands up for his or her beliefs, which is protective against engaging in risky behavior, such as racing with friends.

1. Introduction

Results from cross-sectional surveys designed to assess the relationship between adolescents drivers' risk appraisals and driving behavior have shown inconclusive results, with some indicating a positive association (Ivers et al., 2009) and others an inverse association (Carter et al., 2014; Mirman et al., 2012; Nelson et al., 2009; Ulleberg and Rundmo, 2003). For example, Machin and Sankey found in a cross-sectional study that broadly phrased risk appraisal items that asked participants to report how risky a behavior was in general, as opposed to their own behavior, (e.g., the concept of running a red light and not *their* running a red light) was inversely associated with self-reported risky driving. In contrast, the measure of specific risk that asked participants to rate proportionally their chance of having an accident (e.g., 10%) over a future time period was positively associated with self-reported risky driving (Machin and Sankey, 2008). The lack of differentiation, theoretically and methodologically, concerning the study of adolescent drivers' "risk appraisals" (also called risk perceptions or risk beliefs), has hampered research intended to further our understanding of the associations among adolescent drivers' risk-related reasoning and their behavior. This lack of clarity has resulted in a scientific literature base that has been hard to interpret (Jonah, 1986). Although these issues are present in the traffic safety field as a whole (and in other domains of risk behavior), the focus of this manuscript is specifically on adolescent drivers due to their disproportionately high crash risk compared to other drivers.

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Efforts to explain these seeming inconsistencies in other domains of adolescent risk behavior have found initial success by drawing on cognitive theories of memory, and judgment and decision-making (e.g., fuzzy-trace theory (FTT)). For example, studies have shown that memories are encoded in both discrete, specific representations as well as in more nebulous, meaning-based gist representations (Brainerd and Reyna, 2001). Therefore, survey items function as memory retrieval cues and can produce intra-individually, positive or negative associations among risk appraisals and risk behavior, depending on how survey items are written combined with the prior risk-taking experiences, or lack thereof, of the individual participants (Mills et al., 2008).

Developmentally, more biologically mature and experienced adults access meaning-based gist representations when reasoning about risk, whereas less biologically mature and inexperienced children and adolescents tend to access more specific representations (Brainerd and Reyna, 2001; Levin et al., 2014; Reyna et al., 2015). Generally, use of meaning-based gist representations is associated with positive health and safety outcomes (Mills et al., 2008; Reyna and Heutel, 2014). Development of these beliefs (and other types of biases and heuristics) and corollary changes in cognitive reasoning is in part experience-based and in part driven by biological maturation (which co-occur), and are associated with individual differences in various domains of cognition (e.g., cognitive abilities) (Jacobs and Klaczynski, 2002; Kokis et al., 2002; Reyna et al., 2011). In sum, according to FTT, adolescent risk-takers weigh the pros and cons of risks and benefits sub-optimally (i.e., trade risks vs. rewards; ignore cumulative risk), while adolescent risk-avoiders quickly perceive the inherent negative and long-lasting consequences of risk-behavior and do not attend to potential for ephemeral gains, leading to overall behavioral patterns of risk-avoidance (see Reyna and Farley, 2006 for a thorough review).

Despite the knowledge that adolescents are much more likely to take risks in the company of their peers in general, preferring the immediate rewards (i.e., fun) that result from engaging in risky behavior (Albert and Steinberg, 2011; Casey et al., 2008; Chein et al., 2011; O'Brien et al., 2011), measures of risk-related reasoning are infrequently assessed along with individual differences in susceptibility to peer influence. This is a critical gap in research, especially in the context of traffic safety. Driving with similarly-aged passengers without adult supervision greatly increases adolescents' crash risk (Chen et al., 2006, 2001). Pathways by which adolescents' peers increase crash risk are thought to include distraction and increases in illegal and aggressive actions (Curry et al., 2012; Pradhan et al., 2014; Simons-Morton and Ouimet, 2006; Simons-Morton et al., 2011).

One cross-sectional study found that stronger beliefs that friends would accept the performance of distracted driving behavior (injunctive norms) and that friends performed distracted driving behaviors (descriptive norms) were inversely associated with adolescents' self-reported behavioral willingness to drive distracted (Carter et al., 2014).[1] Stronger resistance to peer influence has been shown to be protective against engaging in other risk behaviors and to increase with age (Monahan et al., 2009; Steinberg and Monahan, 2007), and may co-develop with the age- and experience-related preference for using gist-reasoning, which has been found to be protective against engaging in risk-behavior in other health domains (e.g., sexual health) (Mills et al., 2008; Reyna and Mills, 2014).

[1] It should be noted that in the Carter et al study, behavioral willingness was called "risk perception" although neither the item stems or response choices directly assessed risk appraisals (e.g., *I would be willing to send a text message while driving. . ..absolutely would not do this task: very willing to do this task*) (Carter et al., 2014; Gibbons et al., 1998; Lerner and Boyd, 2005).

1.1. Summary and objectives

The current study was designed to overcome three limitations in the current literature on adolescent drivers, risk appraisals, and their risk behavior: (1) reliance on cross-sectional studies make it impossible to make strong inferences about whether or not risk appraisals lead to risk behaviors; (2) lack of theoretical and methodological clarity on the type of risk appraisal(s) being measured; and (3) infrequent inclusion of measures of resistance to peer influence despite the strong empirical ties between the commission of risk behavior in the company of friends among adolescents, especially among younger recently licensed adolescents.

Therefore, using a prospective study design, we sought to determine if adolescents' gist and specific beliefs about risky driving and individual differences in resistance to peer influence predicted the self-reported likelihood of racing behavior in the company of their friends. We hypothesized that stronger specific risk beliefs would be associated with greater likelihood of racing, while stronger gist beliefs about the dangers of driving and greater resistance to peer-influence would both be protective (i.e., predict a decreased likelihood of racing). We further hypothesized that resistance to peer influence (RPI), an index of psychosocial maturity, would be positively associated with gist risk appraisals and negatively associated with specific risk appraisals.

2. Methods

2.1. Participants

A convenience sample of 132 adolescents (ages 17–18) was recruited from community-based organizations in 2010 and 2011. To be eligible, participants must have held a valid Pennsylvania driver's license for ≥3 months. At the time of the study, Pennsylvania state law required that adolescents be at least 16.5 years-old to have an intermediate driver's license. There were no passenger restrictions for 18 year-old drivers and for 17 year-old drivers who had taken driver's education; 17 year-old drivers who had not taken driver's education were limited to one passenger younger than 18.

2.2. Procedures

The study consisted of surveys at Time 1 (enrollment) and follow-up surveys 12 weeks later (Time 2). At Time 1, data collection was completed in-person. Time 2 surveys were completed online using a secure web-based survey. Following informed consent procedures, data were collected from participants in schools and in other community locations. Adolescents received a small monetary compensation for their time and effort. This study was approved by The Children's Hospital of Philadelphia's Institutional Review Board.

2.2.1. Survey measures

Participants completed a brief sociodemographic survey (e.g., gender, race, and hours driven per week). Racing behavior was measured by the item: *"I raced other cars on the road when I was driving with my friends in the car in the **past 1 month**"; response choices* were on a 5-point scale (1) very untrue for me to (5) very true for me. As adolescents might be inclined to under-report illegal and high risk activity, any response greater than "very untrue" warranted considering the participant as a "racer".

Risk appraisal items were informed by FTT (Mills et al., 2008) and the theory of planned behavior (Ajzen, 1991). Consistent with these paradigms, we used a single item: *I am likely to get in a crash in the **next 1 month** when I'm driving in the car with my friends* (response choices ranged from (1) very unlikely to (7) very likely)