UNIVERSITY OF QUEBEC IN MONTREAL

PERCEIVED PEER-GROUP SOCIAL NORMS AS UNDERLYING MECHANIMS OF FRIEND AND PARENTAL INFLUENCE IN EARLY ADOLESCENCE

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LA PERCEPTION DES NORMES SOCIALES: MÉCANISME SOUS-JACENT L'INFLUENCE DES PARENTS ET DES AMIS CHEZ LES JEUNES ADOLESCENTS

THÈSE

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LIST OF ABBREVIATIONS

CFI ……Comparitive Fit Index

MLR ……..Maximum likelihood estimation with robust standard errors

RMSEA ……..Root mean square error of approximation

SSRS …….Student Self-Report Survey

TSNB ……Theory of Social Normative Behavior

RÉSUMÉ

La présente thèse a pour objectif de parfaire les connaissances actuelles et la compréhension des différents facteurs sociaux qui influencent, expliquent et promeuvent l'adaptation psychosociale au début de l'adolescence. L'engagement scolaire et la consommation de psychotropes sont considérés comme des indicateurs complémentaires de l'adaptation psychosociale. Respectivement, ceux-ci représentent des indices d'ajustement et de risque pour le jeune adolescent. Nous examinons comment trois composantes des environnements de socialisation primaire du jeune – les normes de son groupe de pairs, le comportement de ses amis et les pratiques parentales – influencent conjointement son engagement à l'école et l'émergence de comportements de consommation de psychotropes. La première étude présente une chaine de médiation longitudinale qui examine l'influence des normes sociales à l'école comme mécanisme sous-jacent à la relation entre les comportements des amis et des parents sur l'adaptation psychosociale du jeune. Les résultats d'un modèle d'équations structurelles effectué auprès d'un échantillon de 1278 élèves de 11 à 13 ans montrent que la perception des normes joue un rôle explicatif dans la relation positive entre les connaissances parentales et l'engagement scolaire de l'élève deux ans plus tard. La perception des normes représente aussi un facteur sous-jacent et explicatif dans la relation positive entre les comportements de consommation des amis et la consommation de psychotropes du jeune au fil du temps. La deuxième étude examine si le comportement des amis et les connaissances parentales modèrent également la mesure dans laquelle les jeunes adolescents sont influencés par les normes sociales perçues. Les résultats montrent que les connaissances des parents atténuent l'influence de la perception des normes sur la consommation de psychotropes de manière transversale à 12 ans et à 13 ans. Dans les analyses correspondantes, les résultats montrent que les connaissances parentales interagissent également de manière transversale avec les normes d'engagement des élèves perçues en rehaussant l'effet de la norme perçue sur l'engagement des jeunes élèves. Le comportement des amis n'a ni augmenté ni affaibli la relation entre les normes perçues et le comportement. Ensemble, cette série d'études confirme l'importance de prendre en compte les perceptions individuelles et subjectives qu'ont les jeunes adolescents de la norme sociale de leur

groupe de pairs dans les interventions en milieu scolaire visant à promouvoir l'adaptation psychosociale des jeunes. Les résultats mettent également en évidence les processus interactifs qui sous-tendent l'influence normative au début de l'adolescence, notamment le rôle que parents et amis jouent en contribuant à la vulnérabilité des jeunes à l'influence normative et en éclairant d'entrée de jeu la perception que les jeunes ont des normes sociales. Finalement, les résultats fournissent une preuve supplémentaire du rôle essentiel que les parents continuent de jouer à mesure que les enfants traversent l'adolescence.

Mots clés : début de l'adolescence; engagement scolaire; consommation de psychotrope; normes sociales; connaissances parentales; influence des amis; modélisation par équation structurelle; analyses longitudinales; modération; médiation

ABSTRACT

The aim of this dissertation is to contribute to current knowledge and understanding of the social context surrounding young adolescent psychosocial adjustment. School engagement and substance use are presented as complementary outcomes of interest representing indicators of psychosocial adjustment and risk, respectively. How three components of young adolescents' primary socializing environments —friendships, family and social norms at school— jointly influence school engagement and the emergence of substance use is examined. More specifically, the first study examines a mediation model to evaluate the role perceived social norms at school play in the relation between friend behavior and parental knowledge on youth outcomes over time. Results of a structural equation model based on a sample of 1278 young adolescents recruited at ages 11 to 13 show that perceived social norms significantly mediate the relation between parental knowledge and school engagement over time as well as the relation between friend substance use and substance use over time. The second study examines whether friend behavior and parental knowledge also moderate the extent to which early adolescents are influenced by perceived social norms. Findings show that parental knowledge mitigates the influence of perceived pro-substance use norms on substance use behaviors cross-sectionally for 12- and 13-year-olds. In accompanying analyses, findings show that parental knowledge also interacts cross-sectionally with perceived student engagement norms by enhancing the effect of the perceived norm on student engagement for younger adolescents only. Friend behavior neither enhanced nor weakened the relationship between perceived norms and behavior. Together, this series of studies confirms the importance of considering early adolescents' individual and subjective perceptions of their peer group's social norms in school-based interventions that aim to promote youth psycho-social adjustment. Findings also highlight the interactive processes that underlie normative influence in early adolescence, including the role parents and friends play in both contributing to youth susceptibly to normative influence and also in informing youth perception of social norms in the first place. Finally, findings provide further evidence to the essential role parents continue to play as children grow into early adolescence.

Keywords : Early adolescence; school engagement; substance use; social norms; parental knowledge; friend influence; structural equation modeling; longitudinal analyses; mediation; moderation;

CHAPTER I :

INTRODUCTION

2.1 General Introduction

Developmental theorists have characterized early adolescence as a period of “storm and stress” (Manning, 1988). Indeed, in their passage from child to adolescent, young adolescents must navigate through major developmental and social changes all occurring in the context of an underlying life transition from elementary to middle school. Larger institutions with more students, less intimate relationships with teachers and classmates, and heightened expectations for student autonomy are characteristics that contrast the secondary school context from the often more personal and structured elementary school environment (Eccles, Lord, & Buchanan, 1996; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). Simultaneously at this age, young adolescents begin to spend less time with their family and more time in activities outside of the household with friends (De Goede, Branje, & Meeus, 2009; Steinberg & Silverberg, 1986). Correspondingly, young adolescent peer groups in general and friendships in particular become more complex, intimate and influential (Berndt, 1982; Brown, 2004; Brown & Larson, 2009). Research demonstrates increased susceptibility to the

influence of schoolmates between the ages of 10 and 13 in comparison with younger children and older adolescents (Steinberg & Silverberg, 1986).

Since Erikson's characterization of early adolescence as period of strife, more recent research proposes that most young adolescents have a smooth transition into adolescence, especially those who benefit from protective factors like positive relationships with their parents and a network of well-adjusted friends (Eccles et al., 1993). However, for vulnerable youths, such new educational and social demands may lead to school failure, escalating behavior problems and marginalization in the school and community (Dishion, Ha, & Véronneau, 2012). Knowing that the consequences of going astray at this age are often enduring, the study of the various social factors that influence, explain and potentially promote young adolescent adjustment is necessary to inform prevention and intervention endeavours that aim to mitigate risk.

A number of behaviors present in secondary school are identified as strongly predictive of future school success and adjustment in adulthood. Specifically, active engagement with academics is viewed as a critical underlying factor of educational achievement over time (Wang & Eccles, 2012). Engaged students are likely to earn higher grades and display better psychosocial adjustment to school than disengaged students, who are more likely to experience academic failure and school dropout (Wang & Eccles, 2012). It is noteworthy that a decline in student engagement is generally observed during the secondary school period (Dotterer, Lowe, & McHale, 2014; Marks, 2000). Simultaneously during this developmental phase, research demonstrates an increase in the prevalence of problem behaviors such as substance use (Lacourse et al., 2002). Entry into adolescence, for some, is also marked by an increase in a variety of problem behaviors including rule-breaking, skipping school, lying, theft, violence and risk-taking behaviors. That being said, for most youth, involvement in problem behaviors does not become chronic (Monahan, Rhew, Hawkins, & Brown, 2014). Young adolescent substance use, however, is a major predictor for substance abuse and related

problems through adolescence and into adulthood (Toumbourou, Stockwell, Neighbours, Marlatt, Sturge & Rehm, 2007). When initiated at a young age, substance use is predictive of school absenteeism, poor academic achievement, school dropout, conduct problems and the development of adult substance abuse and dependency problems (Dishion & Patterson, 2006; Ellickson, Tucker, & Klein, 2001; Fergusson, Swain-Campbell, & Horwood, 2002). School engagement and substance use are negatively correlated behaviours and are likely to share a set of identical predictors. In this dissertation, young adolescent school engagement and substance use are presented as complementary outcomes of interest representing indicators of psychosocial adjustment and risk, respectively.

Research converges on the importance social context plays in promoting or inhibiting youth active engagement in school and early initiation of substance use. In fact, as youth spend most of their wakeful time at school, grade-wide social norms play a key role in informing emerging beliefs, attitudes and behavior choices (Duan, Chou, Andreeva, Pentz, 2009; Roditis, Delucchi, Chang, Halpern-Felscher, 2016; Song, Smiler, Wagoner, & Wolfson, 2012). Simultaneously, research has repeatedly pointed to young adolescents' heightened susceptibility to the influence of their close friends' behavior (Brown & Larson, 2009). It also highlights the essential and continued role parenting practices play in mitigating risk and in supporting positive outcomes in young teens (Flanagan, Auty & Farrington, 2019, Rioux, Castellanos-Ryan, Parent, Vitaro, Séguin, 2019). In two studies, this project investigates how three components of young adolescents' primary socializing environments— school norms, friendships, and family—jointly influence school engagement and the emergence of substance use.

2.2 Literature review

2.2.1 School engagement and substance use

Study of the adolescent peer context has largely focused on an examination of the predictors of problematic youth behaviors. Less attention has been paid to behaviors that are considered as pro-social or desirable—a discrepancy that leaves our understanding of the relation between adolescents' social context and psychosocial adjustment incomplete (Laninga, Petit, Bates & Dodge, 2003). This project considers both school engagement and substance use as complementary markers of early adolescent psychosocial adjustment.

According to Fredricks, Blumenfield, and Paris's model (2004), student engagement is conceptualized as a multifaceted construct that includes three interrelated dimensions. *Emotional engagement* refers to the extent to which students value school, are interested in learning, and experience positive affect towards school, teachers and classmates. *Cognitive engagement* refers to the cognitive effort students invest towards understanding and mastering school material. *Behavioral engagement* refers to students' participation in learning activities, presence of positive behavior and absence of disruptive behavior in school. Indicators of behavioral engagement are easily observable and quantifiable and include school attendance, adherence to school rules, on-task behavior in the classroom, participation in extra-curricular activities and homework completion (Fredricks, Blumenfeld, & Paris, 2004). As a "meta-construct" that comprises multiple behavioral, emotional and cognitive components, school engagement reflects a well-rounded portrayal of youth's approach to their studies that is more holistic than simple focus on academic achievement in regards to grades (Jimerson, Campos, & Greif, 2003). Given that this study explores the influence of social norms on behavioral outcomes, academic engagement in this study is defined specifically in terms of behavioral engagement.

Behavioral school engagement has been widely studied due to its robust associations with myriad markers of academic and psychosocial adjustment. In fact, active behavioral engagement in school is viewed as a critical underlying factor of academic achievement. Students who are actively engaged in their studies are more likely to complete high school and experience higher post-secondary educational attainment (Archambault & Janosz, 2009). Further, student engagement is associated with a host of benefits that go beyond academic achievement. Young adolescents who are engaged in their studies also report higher levels of self-esteem and more positive relationships with peers, as well as lower levels of depression, delinquency and substance use than their disengaged counterparts (Branden, 2006; Li & Lerner, 2011; Wang & Fredricks, 2014; Wang & Peck, 2013). In fact, Van Ryzin, Gravely and Roseth (2009) conclude that due to its positive influence on adolescent sense of belongingness, academic autonomy and teacher support, school engagement represents a key contributor to psychological well-being in youth. Despite the numerous positive benefits of student engagement in early adolescence, many studies document a decline in student engagement at this age (Eccles et al., 1993; Li & Lerner, 2011). Also, young adolescents who display drops in school engagement are found to be at the highest risk for school drop out later in high school (Lamothe et al. 2013). Considering the many academic, social and emotional benefits associated with student engagement, this project considers it as a pivotal indicator of young adolescent psychosocial adjustment. Concurrently, substance use, a behavior that when present at this age is predictive of the development of myriad future academic and psychosocial difficulties, is also explored.

Worldwide, smoking, drinking and using illicit drugs are leading causes of mortality and illness in both adolescence and adulthood. In the year 2000, alcohol and illicit drugs contributed to 23.3% of the global burden of disease in industrialized countries. Hazardous alcohol use is estimated to have played a role in 31.5% of all deaths of men aged 15–29 years old. This age category was the most affected by substance-use related

deaths, counting for 86% of deaths across all age groups (Toumbourou et al., 2007). Since 2000, the number of people with substance use related disorders has increased world-wide and recent data suggests that the global prevalence of substance abuse disorders is of 2.4% representing 314 million people (Degenhardt et al. 2016; WHO, 2018). These rates echo those found in Canada where 2.7% of the population suffers from alcohol dependence disorders (Pearson, Janz & Ali, 2013). In 2012, data showed that approximately 21.6% of Canadians have met criteria for substance use disorder during their lifetime. Relative to the rest of Canada, the province of Québec presents with higher casual drinking rates than those observed in the rest of the country, showing a higher percentage of occasional drinkers and regular drinkers (1 or 2 drinks a day). The province of Québec also shows differing patterns of excessive drinking and high-risk drinking than the rest of the country, with Québec presenting lower rates than the other provinces (Adlaf, Begin & Sawka, 2005). Despite these differences, rates of excessive and high risk drinking have increased in Quebec since the early 2000s. A province-wide survey of high-school students' health-behaviors identified early adolescence as a pivotal period of risk for the emergence of lasting substance use difficulties, including for alcohol, marijuana and tobacco, a trend also emphasized in the broader substance use literature and in samples worldwide (Traoré et al., 2018).

For some, experimentation with drugs and alcohol begins in early adolescence, and use at this age elevates the risk for the subsequent development of substance use disorders, like abuse or dependence (Bauman & Phongsavan, 1999). Longitudinal cohort studies show that early use of a particular substance increases the risk of progression in use, in terms of frequency, quantity and abuse of that substance in adulthood (Toumbourou et al., 2007). In fact, age of onset of use is considered as the most significant predictor of the development of substance use disorders in regards to alcohol and cannabis (Behrendt, Wittchen, Höfler, Lieb, & Beesdo, 2009; Buchmann et al., 2009; Winters, Stinchfield, Latimer, & Lee, 2007). A common explanation for the risks associated with early onset substance use is that early users accumulate greater exposure to the

substance, thus increasing the hazard of developing tolerance and dependence to it, which in turn makes them more vulnerable to the development of long-term problems (Winters et al., 2007). This is especially relevant in the province of Québec where early exploration with alcohol, tobacco and marijuana is highly prevalent with province-wide data showing that by the age of 14, more than 25% of youngsters have already consumed alcohol, 6% have already consumed tobacco and almost 15% marijuana (Traoré et al., 2018).

Beyond being predictive of long-term substance use problems, initiation of substance use in early adolescence is associated with a host of immediate social and academic difficulties that further increase the risks associated with early use. The majority of cited studies in this project tend to use global scores for substance use that represent a combination of substances and do not focus solely on one type. For instance, substance use (including tobacco, cannabis and alcohol) in young adolescence is predictive of deviant peer affiliation and increases risk for school failure, school absenteeism, school dropout, the incidence of conduct problems, and low levels of educational attainment following high school (Tobacco and drinking: Diseth & Samdal, 2015; alcohol: Fergusson et al., 2002;Ellickson et al., 2001; Alcohol, cigarettes and cannabis: Fallu et al., 2010; Marijuana: Palmer et al, 2009; Marijuana:Verweij, Huizink, Agrawal, Martin, & Lynskey, 2013). Hence, as a risky behavior that is predictive of immediate and long-term psychosocial difficulties, the occurrence of substance use in early adolescence is a critical indicator of youth vulnerability and risk.

There is robust evidence that both student engagement and substance use are malleable constructs that are susceptible to social influence (Fredricks et al., 2004; Monahan, Rhew, Hawkins, & Brown, 2014). Investigation of the ways in which important social elements in young adolescents' lives influence their school engagement and substance use behaviors may inform prevention endeavors that strive to promote adjustment and mitigate risk (Fredricks et al., 2004; Marks, 2000; Appleton, Christenson & Furlong,

2008). Young adolescents spend most of their waking hours at school and have been shown to be particularly susceptible to the influence of their peers and classmates. As such, social pressures exerted in the school environment play a pivotal role in informing their behavior. More specifically, classrooms represent unique settings for social influence. Students of a classroom become involuntary members to a group with whom they share a majority of their time. Within classrooms, students engage in daily interactions and develop a complex network of relationships. Information and feedback on beliefs, norms, rules, and desired behaviors is constantly exchanged and reinforced (Crosnoe et al. 2008). As described by Sentse, Scholte, Salmivalli and Voeten (2004), in childhood and adolescence, the classroom setting is one of the most salient peer-group contexts. Implicit and explicit expectations about approved-of behaviors within the group emerge and are communicated, affecting the behavior of individual students, even when they do not reflect their private attitudes (Juvonen & Galvan, 2008; Shin, 2017). The influence of classroom social norms in early adolescence has been investigated in relation to myriad behaviors including school achievement, aggressivity, bullying and anti-social behaviors (Brendgen, Girard, Dionne & Boivin, 2013, Chang, 2004; Dijksta & Gest, 2014; Henry et al., 2000; Laninga-Wijen et al. 2018; Rodkin & Ryan 2012). This project examines the mechanisms through which one key aspect of the classroom environment—namely, peer-group social norms—influences young adolescent school engagement and substance use.

When taken individually, school engagement and substance use represent key complimentary indicators of early adolescent adjustment and maladjustment, respectively. School engagement in the early years of adolescence inserts itself into a longer developmental trajectory of engagement that sets the stage for future life-success and well-being (Fredricks et al., 2004). As a key predictor of academic achievement and educational attainment levels, it favors successful completion of high school and continuation to higher education which, in turn, contribute favorably to professional success, economic stability and higher quality of life in adulthood (Lamote

et al., 2013). On the contrary, problems related to substance use often represent the beginning of a lasting and opposite developmental trend. Early substance use is associated with academic difficulty, lower educational attainment, comorbid health and mental health difficulties and increased substance use in adulthood (Palmer et al., 2009).

When considered together, as in this dissertation, they serve to inform a comprehensive assessment of youth outcomes that takes into account how various social processes, including the influence of social norms, may serve to differently promote or hinder these two complementary markers of early adolescent wellbeing. As will be detailed more thoroughly further on, the influence of perceived peer-group social norms is a central focus of this dissertation. The combination of a behavioural outcome that is an indicator of positive youth adjustment (school enagagement) with an indicator that, conversely, represents a risk factor (substance use) follows calls for social norm research that allows for the differential assessment of how social norms operate for different behaviors and in different contexts (Cislaghi & Heise, 2018). By doing so within the same studies, we are able to consider the relative influence of various predictors and outcomes of norm perception together yielding a more comprehensive and thorough examination of the process.

2.2.2 The influence of peer group social norms

Through the actions of their members, peer groups communicate information about what is socially accepted and approved of within the group (Borsari & Carey, 2001). By knowing how others typically behave, individuals can effectively determine how to act appropriately in any given context (Cialdini, Reno, & Kallgren, 1990; Lapinski & Rimal, 2005). In early adolescence, a developmental period during which fitting in is

meaningful, knowing and understanding what is socially normative is particularly influential when making behavioral decisions. In fact, susceptibility to peer-group influence peaks in early adolescence (LaFontana & Cillessen, 2010). Yet, research on normative influence to date has focused largely on adult or college-aged samples with much less attention being paid to how norms influence behavior in young adolescents, a population who is most susceptible to normative influence.

Social norms theories are numerous and offer diverse definitions and operationalizations of the concept. One central distinction in social norm research is between descriptive and injunctive norms. According to the Focus Theory of Normative Conduct, *descriptive norms* refer to the typical behavior or prevalence of a behavior within a social group, meanwhile *injunctive norms* refer to the extent to which individuals perceive that others expect them to behave in a certain way (Cialdini, Kallgren & Reno, 1991). Descriptive norms point to what is being done by most and motivate behavior by suggesting what behaviors might be most effective in a particular situation. By speaking to what the majority does, descriptive norms suggest which actions are most usual in a particular situation. Injunctive norms, on the other hand, motivate action through the potential social rewards associated with a behavior (Cialdini, Kallgren & Reno, 1991).

In contrast to injunctive norms which require a deeper understanding of the social dynamics, values and expectations within a group, descriptive norms refer to concrete behaviors that are immediately observable and easier to detect (Cialdini, Kallgren & Reno, 1991; Kallgren, Reno & Cialdini, 2000). By speaking to what others typically do, they provide a normative reference that informs inferences on what behaviors are likely to be most accepted by the group without requiring deep understanding of group expectations or values. Thus, they function as a decisional heuristic on which to base cognitively effortless and hopefully efficient behavioral decisions (Shah & Oppenheimer, 2008; Stok, de Ridder, de Vet, & de Wit, 2014). Because descriptive

norms are easily observed, they are particularly informative in social circumstances that are new, unfamiliar or ambiguous (Cialdini et al., 1990). Hence, it can be expected that descriptive norms are highly influential in early adolescence, a period in which youth enter a new middle school context with unfamiliar peers. In fact, in a study examining the influence of descriptive norms on prosocial behavior, descriptive norms were found to develop and stabilize quickly in the first year of secondary education, indicating their utility as a key source of information on which to base behavioral decisions (Laninga-Wijen et al. 2018).

A second major distinction made in this project is between objective descriptive social norms and individuals' subjective perception of those norms. *Objective norms* refer to the prevalence of a behavior within a group. However, as a subjective internal process of interpretation that varies from person to person, *norm perception* is sensitive to bias and error. Because a person rarely has access to information on the actual prevalence of a behavior, their estimate of a norm likely draws on multiple individual factors. For example, these may include previous experiences, observations, values, and also knowledge of one's own behavior and of that of close others. Hence, an aggregation of perceived norms among members of a social group will probably not represent the prevailing unbiased normative behavior (Lapinski & Rimal, 2005). Social norms theory suggests that while people are driven to align their behavior with their normative belief of that behavior, their perception of pro-social behaviors tends to be an underestimation of the true prevalence while their perception of risky behaviors tends to be an overestimation. (Chung and Rimal 2016). This is exemplified by results from studies demonstrating that college students tend to overestimate the descriptive norm for alcohol consumption (Borsari & Carey, 2003).

Despite its subjective nature, perception of norms remains an important predictor of behavior (Akers, Krohn, Lanza-Kaduce, & Radosevich, 1979). In fact, perceived friend and peer behavior is more strongly associated with personal behavior than measures of

actual friend or peer behavior (Iannotti, Bush, & Weinfurt, 1996). School engagement and substance use can also be susceptible to normative influence. Several studies conclude that adolescents who perceive a high prevalence of substance use among peers are more likely to engage in binge-drinking and illicit drug use than their peers who do not hold such normative beliefs (Perkins, Craig, & Perkins, 2011; Song, Smiler, Wagoner, & Wolfson, 2012; Teasdale, Stephens, Sloboda, Grey, & Stephens, 2009). In their cross-sectional study on adolescent marijuana use, Roditis and colleagues (2016) report that participants over-estimated their friends' marijuana use, stating that half their peers used marijuana meanwhile only one quarter reported having actually used it. Further, those who perceived that their friends consumed were almost 30% more likely to use marijuana themselves. Similar longitudinal results were obtained by Schmidts, Mathys and Quertemont (2015), who concluded that perceived peer group use was a major contributor to cannabis initiation over time, and even so when perception of peer use was reported before first time initiation.

Perceived social norms may also serve to encourage or discourage active participation in learning activities at school. In fact, in early adolescence, a decline in perceived norms for academic engagement and an increase in perceived norms for academic disengagement is noticed between grades four and eight. In school environments in which academic achievement and effort are not valued, students may not want their peers to know that they work hard in school and may downplay their effort, achievement and school-related goals (Galvan, Spatzier, Juvonen, 2011). Students may thus perceive that school engagement is not as common as it is in reality. Research has shown a link between how engaged students perceive their classmates to be in school and their own grades, number of absences, and interest in school by the end of the school year (Moos & Moos, 1978).

Social marketing approaches to behavior modification attest to the powerful influence of norm perception on individual behavior. Such programs aim to modify individuals'

behavioral choices by correcting their misperceptions of prevailing social norms (Borsari & Carey, 2003; Morrongiello, McArthur, Kane, & Fleury, 2013; Perkins et al., 1999). For example, in their study on teenagers' intentions to wear a bicycle helmet, Lajunen and Rasanen (2004) demonstrated that perceiving a descriptive norm supporting helmets was the strongest predictor of intent to wear one and concluded that the most efficient way to alter youngsters' attitudes towards bicycle helmets was to influence the peer group's opinion of helmets (Lajunen & Rasanen, 2004). Norm changing programs have also effectively targeted drinking (Perkins et al., 1999), recycling (Cialdini et al., 1990), and healthy eating behaviors (Stok, Ridder, Vet, & Wit, 2014).

More specifically, social norms marketing campaigns have been widely implemented in American universities to reduce heavy and binge drinking behaviors among college students (Haines, 1996). Such programs are based on the premise that previous prevention strategies that focus on images warning students of the high prevalence of risky drinking behavior may have been counter effective. By communicating: "this is how most college students behave, this is a pandemic that must be addressed," these campaigns inadvertently normalize heavy alcohol consumption. Students are then at risk for developing exaggerated perceptions of the descriptive norm of alcohol use and use this inflated reference frame for measuring their own consumption levels. In other words, when heavy alcohol use is normalized, students may see their own use as less problematic (relative to their perceived norm) and may be less inclined to feel the need to modify their own behavior (Perkins et al., 1999). Conversely, if personal use is seen as higher than the norm, re-assessment of habits and modification of behavior is more likely (Borsari & Carey, 2003). Advocates of social norms marketing campaigns strive to provide students with realistic portrayals of campus drinking habits to reduce the perceived alcohol consumption norms and subsequent drinking behavior by conveying that, in fact, most students do not drink, or drink responsibly (Borsari & Carey, 2003; Haines, 1996; Perkins et al., 1999).

2.2.3 Filling a research gap: Social norms studied two ways

While it has been established that social norms both incite and guide behaviors in early adolescence, how they do so and under what circumstances remain to be investigated. This is evidenced in several recent review studies that highlight limitations in how social norms have been previously theoretically defined and practically integrated into social marketing prevention programs (Cislhagi & Heise, 2018). Failure to examine social norms as complex processes involving reciprocal influences with the context in which they emerge, and interactions with this context as well, limits their practical potential to be harnessed as vehicles for behavior change (Cislhagi & Heise, 2018). In two studies, this dissertation seeks to account for previous shortcomings by considering peer group social norms within the broader social-developmental context of early adolescence. Study 1 tests a mediation model that investigates how adolescents' social context informs their individual perception of social norms, and in turn, their adjustment. Study 2 tests a moderation model that explores how social context promotes or inhibits the known influence of perceived social norms on behavior.

Typically, norm research has rested on the premise that covariation between a perceived norm and a taken action is indicative of normative influence (Norms → behaviour). However, an inherent problem to this model is directionality, because perceived norms may also be the consequence of individual behaviour and pre-existing beliefs (Behaviour or beliefs → perceived norms). Longitudinal research designs that account for participants' baseline levels of behavior are thus necessary for effectively assessing normative influence on behavior. Moreover, recent studies press the necessity for researchers to consider the interdependence and multitude of factors from which individual actions originate, stating that previous research oversimplifies the

complexity of the processes involved (Chung & Rimal, 2016; Cislaghi & Heise, 2018). In their study exposing common pitfalls of norm research, Cislaghi and Heise (2018) warn against research that positions norms as sole influents of behaviour and call for studies that consider normative influence as a result of interacting factors. In a mediation model, Study 1 seeks to account for previous shortcomings by investigating normative influence longitudinally as an underlying mechanism of influence in the relation between youth social context and youth behavior. Specifically, we seek to identify the external factors that lead to the development of individuals' subjective perception of their larger social normative context. Subsequently, how this perception ultimately predicts school engagement and substance use over time is examined (Figure 1.1).

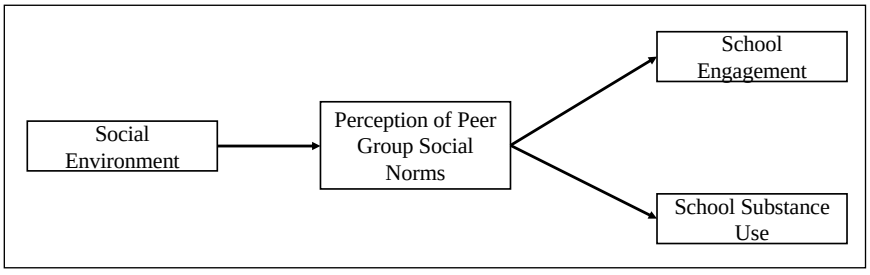

Figure 1.1 General model tested in Study 1

The second study of this project draws from the Theory of Social Normative Behavior (TSNB) which seeks to explain the mechanisms that moderate the extent to which descriptive norms influence behavior (Rimal, 2008). Specifically, this theory proposes that descriptive norms influence behavioral choices through their interaction with other factors. For example, the magnitude of the relationship between descriptive alcohol consumption norms and behavioral intentions to drink can be amplified by pro-drinking injunctive norms, by strongly identifying with the reference group, or by perceiving that benefits will come from drinking (Rimal, 2008). Beyond the three suggested

moderators included in the TSNB, recent research in norm theory has explored the role played by individual factors, such as cultural characteristics and self-identity, as moderators of the influence of social norms on behavior (Lapinski & Rimal, 2005). In a moderation model, the second study of this project aims to extend this theory and examines the role played by key social factors as moderators of the influence of peer norms on school engagement and substance use in early adolescence (Figure 1.2).

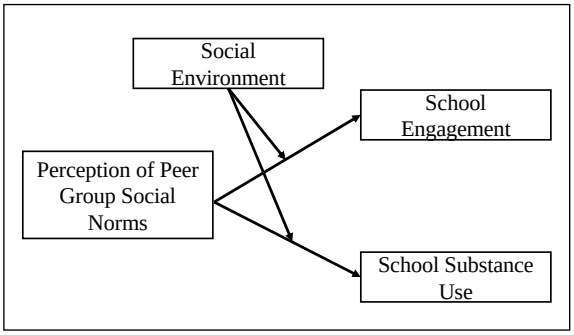

Figure 1.2 General model tested in Study 2

While mediator-oriented research is interested in the underlying mechanisms explaining the relation between two variables, moderator research typically investigates the role played by the predictor variable (Baron & Kenny, 1986). More specifically, moderation analyses seek to identify the contextual variables that influence the presence or strength of the relation between the predictor variable and outcome variable. Hence, the mediation model in Study 1 aims primarily to shed novel light on the mediating role played by perceived social norms as a mechanism of importance underlying the known relation between social context and youth outcomes. Following Study 1, the moderation model tested in Study 2 examines the conditions that influence the strength of the previously established relationship from Study 1 between perceived norms and youth outcomes.

Several actors are crucial players in young adolescents' social context. At this age, friends take on a growing importance as the role of parents, once central in childhood, gradually changes to leave more room for youth to develop their autonomy. In fact, the need for continued parental involvement remains crucial as student engagement levels tend to decrease and exploration of substance use increases, because such behaviors may put youth at risk for immediate and long-lasting academic and psychosocial difficulties. This project explores the role played by parents and friends in influencing school engagement and substance use in two ways: by informing youth perception of social norms and by affecting youth resistance or susceptibility to the influence of perceived norms.

2.2.4 The influence of parents

In this dissertation, assessment of parental knowledge is chosen to represent a heuristic measure that captures, in a simple way, a complex set of interactions between adolescents and their parents. Parental knowledge has indeed been shown to be closely related to the quality of the parent–child relationship, parental warmth, child disclosure, parental monitoring and effective rule-setting (Rote, Smetana, 2018; Stattin & Kerr, 2000; Dishion & McMahon, 1998). Parental knowledge refers to the extent to which parents are aware and informed about their children's life, as a result of seeking out and/or receiving information on their children's day-to-day activities and social interactions (Statin & Kerr, 2000). Parent–child interactions that promote parental knowledge include open child disclosure in response to parental interest. Such exchanges create opportunities for parents to adopt preventative parenting practices such as providing appropriate feedback about the possible consequences of their choices and behaviors, providing encouragement for prosocial behavior, and engaging

in rule-setting (Stattin & Kerr, 2000). Criticisms of the conceptualization of parental knowledge question the constructs' omission to consider its dyadic nature and its dependence on the child's willing disclosure about their peers and activities (Stattin & Kerr, 2006). We consider child disclosure to be a necessary aspect of parental knowledge and hence view it as a construct that is recriprocal and dyadic in nature. For this reason, our project taps into the child's direct invovelment in parental knowledge by prioritizing a child-report measure. Child-reported parental knowledge is considered as a more accurate reflection of the extent to which parents are informed because youth know how much information they shares with their parents or not, contrary to parents who can only guess, and perhaps overestimate the amount of information they truly know (Rote & Smetana, 2018).

Studies have repeatedly shown that parental knowledge mitigates an array of problematic behaviors in adolescence, including alcohol consumption, bullying, illicit drug use and internet gambling (Clark, Shamblen, Ringwalt, & Hanley, 2012; Curtner-Smith & MacKinnon-Lewis, 1994; Flanagan, Auty & Farrington, 2019; Fosco, Stormshak & Dishion, 2012; Lac & Crano, 2009; Kapetanovic, Bohlin, Skoog & Gerdner, 2017; Martins, Storr, Alexandre, & Chilcoat, 2008). Moreover, parental knowledge has also been shown to play an essential role for young adolescents in promoting desirable outcomes such as school engagement and academic achievement, and is related to higher self-esteem and self-efficacy (Alfaro, Umaña-Taylor, & Bámaca, 2006; Kilian, Hofer, & Kuhnle, 2013; Lowe & Dotterer, 2013; Flanagan, Auty & Farrington, 2019; Bacikova-Sleskova, Benka, Orosova, 2019, Dotterer & Wehspann 2016, Bean, Barber & Crane, 2006).

Beyond directly predicting positive youth outcomes, parental knowledge has been shown to indirectly mitigate the potential consequences related to other social risk factors such as affiliation with deviant peers, bullying and risks associated with low-income neighbourhoods (Kapetanovic, Bohlin, Skoog & Gerdner, 2017; Tian et al.

2018; Yang et al. 2007). In fact, parenting practices characterized by communication not only facilitate the development of positive peer contexts, but also promote opportunity to offer guidance and set effective rules. When parental implication is low, youth may seek advice from their peers who are likely inadequate replacements to adult support (Fosco et al. 2012). Dishion, Poulin and Medici Skaggs (2000) suggest, in fact, that parents who disengage from monitoring of their child too early leave them vulnerable to the influence of deviant peers, a situation referred to as *premature adolescent autonomy*. Parental knowledge can thus not only directly affect adolescent behavior, but can do so indirectly by impacting exposure to peer influence which in turn further increases risk for the development of problematic behaviors.

Relevant to this study, open and regular communication between parents and their young teenagers likely also gives rise to occasions for parents to discuss with their child about their perceptions of their classmates' behavior and potentially correct their misperceptions of peer group norms. For example, in response to a young adolescent who complains that everyone else is allowed to stay out late, a parent may explain that in fact, it is normative for most similarly aged kids to have a curfew. In this manner, through the enhanced communication and relational stability that it fosters, parental knowledge may play a crucial role in influencing youth perception of and susceptibility to social norms.

2.2.5 The influence of friend behavior

At all ages, friends are more alike in their attitudes and behaviors than non-friends. Friendships tend to be formed based on a selection process through which individuals associate with peers who are similar in interests and activities. Subsequently, the qualities that first attract individuals to one another are reinforced through socialization processes if the friendship is maintained (Kandel, 1978). Thus, over time, we can

expect well-adjusted youth who associate with similar friends to become more compliant to social norms, whereas antisocial youths are likely to engage in more anti-normative behaviors (Hartup, 1996).

Early adolescence is a developmental period characterized by a heightened concern for fitting in. Peer evaluations and opinions become highly salient at this age as attaining and maintaining friendships grows in importance (Lafontana & Cillessen, 2010; Rubin, Coplan, Chen, Bowker & McDonald, 2011). Upon entering middle school, young adolescents usually form new friendships and encounter various opportunities to interact with different others—pro-social peers as well as those potentially involved in deviant or rule-breaking behaviors. Through exposure to and learning of different values and attitudes, youth who associate with individuals who engage in problematic behaviors are likely to have greater opportunity to also become involved in such acts over time (Urberg, Luo, Pilgrim, & Degirmencioglu, 2003).

Substance use (particularly in adolescence) is a socially embedded behavior that most often takes place in group settings. This renders youth particularly susceptible to the influence of substance-using close friends. According to Oetting and Beauvais's Peer Cluster Theory (1987), adolescent substance use results from socialization processes through which peers shape youth's attitudes, values and beliefs about alcohol or drugs, and determine actual substance use behaviors. Friend groups prescribe what, where and when substances are consumed. In fact, one of the most robust predictors of teen substance use is peer substance use (Kobus, 2003; Oxford, Oxford, Harachi, Catalano, & Abbott, 2001; Tucker et al., 2012). In a study by Monahan and colleagues (2014), affiliation with substance using peers is associated with escalation in subsequent substance use over time and increases in peer drinking behavior is linked with subsequent increases in individual use (Monahan, Rhew, Hawkins, & Brown, 2014). Meanwhile, research shows that adolescents who gained a friend who smoked cigarettes became three times more likely to initiate smoking and five times more likely

for smoking behaviors to escalate to a daily use, one year later, in contrast to those with no new smoking friends (Tucker, Edelen, Ellickson, & Klein, 2011). Overall, numerous studies have repeatedly called attention to the role substance-using friends play in influencing both adolescent substance initiation and increase in use (Kim, Zane, & Hong, 2002; Maxwell, 2002; Mounts & Steinberg, 1995).

Evidence shows that, like for peer influence on substance use, spending time with school friends who are highly motivated, rule-compliant, achieving and engaged promotes young adolescents' own motivation, rule-compliance, achievement and engagement at school (Simons-Morton & Chen, 2009; Wentzel, Barry, & Caldwell, 2004). Because declines in school motivation, academic performance and school engagement are observed at this age, a better understanding of the role played by friends in either promoting or hindering adolescents' active engagement in academics is important (Simons-Morton & Chen, 2009). In fact, results from a social network study on middle school students by Ryan (2001) show that beyond the effects of selecting similar friends to begin with, having friends who dislike school and who display low levels of academic achievement predicts lower enjoyment of school and worse grades over the school year, whereas associating with school-valuing and high-achieving friends predicts smaller declines in those respective areas by the end of the year. Similarly, numerous studies show that students with friends who succeed in school, participate in classroom activities, value school success and put active effort into school-related tasks are likely to develop similar behaviors over time periods that range from one to three school years (Altermatt & Pomerantz, 2005; Berndt, 1999; Kindermann, 2016; Véronneau & Dishion, 2011). Overall, through ongoing interactions with friends who value school effort, young adolescents internalize positive academic related beliefs, values and goals that are consistent with those of their peers (Liem & Martin, 2011; Monahan et al., 2014; Maatta, Stattin, & Nurmi, 2006; Nelson & DeBacker, 2008).

Although studies relating friend behavior to young adolescent outcomes are numerous, the mechanisms through which friend influence operates to impact changes in youth school engagement and substance use are still relatively unknown (Véronneau & Dishion, 2011). One consideration that must be taken into account when studying the possible influence of group norms is that observing the behavior or attitudes of peers who are outside of one's friend circle can be difficult. Close friends' behavior and attitudes may serve as a more accessible source of information for making inferences about wider peer-group social norms. However, having friends whose behaviors differ from the group's descriptive norm may contribute to potential biases and misperceptions of social norms. Therefore, it is relevant to study whether friends' influences on youth behavior, as found in several of the above-mentioned studies, may be through their influence on youth's perception of their group's social norms.

Another important consideration to keep in mind is that friend behavior that is aligned with one's perception of the wider peer group norm renders the norm particularly salient (Laninga et al. 2019). According to the Theory of Social Normative behavior, the influence of norms on human behavior is most powerful in contexts where they are rendered salient, such as when a behavior is directly observed or discussed (Rimal, 2008). Thus, beyond being a potential predictor of norm perception, friend behavior may also interact with norm perception to impact youth susceptibility to the influence of their peer group's norms. A bio-ecological approach will be drawn on to inform our understanding of the roles various social actors play in young adolescents' lives.

2.2.6 Bio-ecological theory: Bronfenbrenner bringing it all together

Most research examining normative influence on behavior lacks consideration of an integrative framework that includes other factors that likely also contribute to the emergence of a certain behavior. This dissertation draws on Brofenbrenner's social-ecological model (Bronfenbrenner, 1999) to integrate key social actors-- parents and friends-- into our consideration of normative influence on school engagement and substance use in early adolescence.

Bronfenbrenner's social-ecological theory posits that who a person is, at any given moment, is the result of that person's attributes combined with environmental influences over the course of his or her life up to that moment. The model conceptualizes interpersonal interactions within the broader social/environmental contexts in which they take place and accounts for the reciprocal influences that playout between them. Human development is understood as stemming from the interaction between biological predispositions with environmental contexts referred to as ecological systems. The microsystem, the most proximal, includes one's interpersonal relationships and one's direct contact with immediate surroundings. The mesosystem represents synergistic phenomena that emerge from the interactions between the various elements of the microsystem, and in this project, refers to the relationships between friend behavior, parental knowledge and social norms surrounding school engagement and substance use. Meanwhile, the chronosystem emphasizes the individual's own continuous, dynamic and reciprocal interactions with each system over time (Bronfenbrenner, Morris, Lerner & Damon, 2006). As illustrated in Figure 1.3, both the mesosystem and the chronosystem are central to this project in that relationships between microsystem factors are examined both immediately (cross-sectionally) and over time (longitudinally). This project allows for the examination of the psychosocial processes that influence substance use and school engagement through early adolescence, a period of rapid developmental and social change.

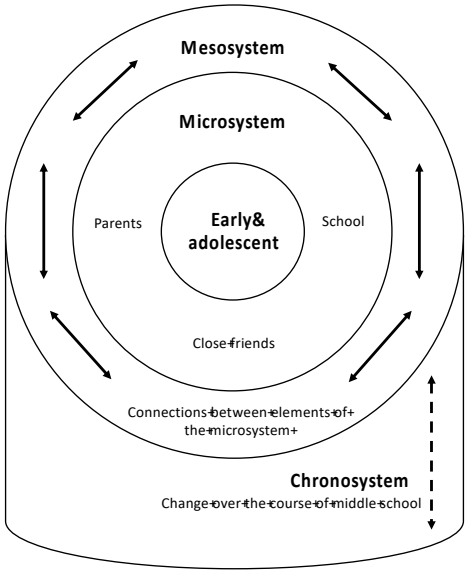

Figure 1.3. Bronfenbrenner's social ecological model presented in the context of the variables and relations under study (macrosystem and exosystem not shown)

2.3 Objectives and hypotheses

2.3.1 General objectives

Overall, several trends mark early adolescence as a period of change and risk. Notably, as children grow into adolescence, active engagement in school tends to decrease and exploration of substance use increases – changes that may put youth at risk for immediate and long-last academic and psychosocial difficulties (Lacourse et al., 2002; Fergusson, Swain-Campbell, & Horwood, 2002; Wang & Eccles, 2012). When considering these behavioral trends and their enduring consequences, it is paramount to investigate the contextual and developmental circumstances in which they occur, because there is robust evidence that both are susceptible to social influences (Galvan,

Spatzier & Juvonen, 2011; Van Ryzin, Fosco & Dishion, 2012). That being said, few studies examine the simultaneous roles played by multiple social determinants when looking at those types of youth behavior. Among studies who do examine how social factors exert combined influence, it is uncommon to explore the relative, independent and interactive effects that three socialization forces—peer norms, parents, and friends—play in influencing two complementary indicators of adjustment together. Moreover, a disproportionate amount of research focuses on maladaptive or risky youth behavior, while less attention is payed to prosocial and adaptive behaviors, leaving our understanding of the social ecology that contributes to youth psychosocial adjustment incomplete (Laninga et al. 2018). In an effort to develop a well-rounded understanding of young adolescent adjustment, this project considers the influence of multiple social actors on both school engagement and substance use—an adaptive and a maladaptive type of youth behavior, respectively. More precisely, this dissertation uses parental knowledge, friends' school engagement and substance use, and perceived peer norms around those behaviors as predictors of change in adolescents' own school engagement and substance use in the early years of secondary school.

Both studies aim to contribute to longitudinal research on social norms in early adolescence in different ways. First, the mediation model in Study 1 seeks to inform understanding of perceived social norms as underlying mechanisms through which parents and friends exert influence on two important aspects of adolescent adjustment and maladjustment, that is, school engagement and substance use. In doing so, it aims to understand the processes through which social influence is exerted. In examining the role parents and friends play in shaping perception of social norms, it also emphasizes the importance of considering the subjectivity of norm perception. Subsequently, by exploring the influence perceived social norms exert on two complementary indicators of adjustement, it builds on recent research that calls for consideration of the differing ways social norms may operate relative to different behaviors (Chung & Rimal, 2016). The moderation model in study 2 takes a different angle by focusing on the conditions

under which perceived social norms exert influence. Its hypotheses stem from gaps in the litterature and inconsistent results of intervention programs that indicate that social norms do not affect everyone in the same way. Its aim is to gain understanding of how one's social context (operationalized here with parents' knowledge and friends' behavior) may affect the extent to which one is influenced by a perceived social norm. In doing so, it strives to inform effective intervention efforts and contribute to the Theory of Social Normative Behavior by identifying parents and friends as meaningful moderators to the effects of descriptive norms on behavior. The following is a more detailed description of the unique goals and hypotheses of each study.

2.3.2 Study 1

Although much research has focused on the numerous ways in which friends and family independently influence youth school engagement and substance use, investigations on the underlying mechanisms that explain *how* these exert influence to impact youth behavioral decisions are required to begin to better understand the processes through which social context contributes to early adolescent outcomes. Given that youth likely vary in their perception of peer group social norms and that such perceptions of social norms are influential in informing their behavioral choices, the Study 1 is a mediation model that explores the role that perceived social norms play as underlying mechanisms of friend and parental influence on adolescent school engagement and substance use over time.

The study objectives are threefold:

1. Investigate the role played by parental knowledge and friends' behavior (school engagement and substance use) in predicting young adolescents' perception of

school engagement and substance use norms in their peer group at school over time, while controlling for baseline perception of peer norms.

2. Examine how young adolescents' perception of school engagement and substance use norms in their peer group at school predict corresponding behavior, that is, their own school engagement and substance use over time, while controlling for baseline levels of those behaviors.

3. Verify if perception of school engagement and substance use norms among peers mediate the relation between the predictors—parental knowledge and friend behavior—and the outcomes of interest, that is, youth school engagement and substance use, after controlling baseline levels of mediators and outcomes.

Hypotheses are as follows. First, we expect that high levels of parental knowledge will be associated with an increase in the perception that school engagement is a normative behavior (i.e., highly prevalent), and that substance use is a less normative behavior among peers one year later. We expect that youth perceptions that school engagement is normative and that substance use is less normative will subsequently predict a positive change ~~i~~n youth adjustment as measured by an increase in school engagement and a decrease in substance use over the following year.

Second, we expect that having friends who display high levels of school engagement will be associated with an increase in the perception that school engagement is normative among peers one year later, which will subsequently predict higher school engagement levels the following year. In addition, it is expected that having friends who use substances will be associated with an increase in the perception that substance use is normative among peers one year later, and that this perception will subsequently predict an increase in youth substance use the following year.

2.3.3 Study 2

Considering that perceived social norms may exert some influence on early adolescent school engagement and substance use (hypothesis explored in Study 1), Study 2 aims to investigate the role parental knowledge and friends' behavior play in rendering youth more or less susceptible to the influence of social norms. Specifically, Study 2 seeks to extend the Theory of Social Normative Behavior by assessing the conditions under which social norms are most influential. Whether parental knowledge and friend behavior act as moderators of the association between perceived peer group norms and youth behavior is examined. This study tests a model comprised of hypothetical paths in which parental knowledge and friends' behaviors are tested as moderators of the influence of peer group social norms on young adolescents' school engagement and substance use, both cross-sectionally and longitudinally.

The study objectives are threefold:

1. Verify whether parental monitoring moderates the relation between perceived peer group norms of school engagement and substance use and corresponding youth outcomes cross-sectionally and over one year.

2. Verify whether friends' school engagement moderates the relation between perceived peer group norms for school engagement and youth school engagement cross-sectionally and over one year.

3. Verify whether friend substance use behavior moderates the relation between perceived peer group norms for substance use and youth substance use cross-sectionally and over one year.

Hypotheses are as follows. It is first expected that youth who perceive school engagement and substance use as normative will be more likely to engage in behaviors that correspond to their perceptions, both concurrently and over one year.

Second, it is expected that high levels of parental knowledge will augment the relation between one's perception of school engagement norms and one's own school engagement. High parental knowledge is also expected to attenuate the association between perceiving substance use as normative and adolescents' own substance use. It is expected that the hypothesized interactions will hold both cross-sectionally and longitudinally.

Third, we hypothesize that friend school engagement will augment the strength of the association between perceived school engagement norms and adolescent school engagement. Meanwhile, friend substance use is expected to augment the strength of the association between perceived substance use norms and adolescent substance use. It is expected that the hypothesized interactions will hold both cross-sectionally and longitudinally.

2.3.4 Gender differences

Research on gender differences in early adolescence presents similarities and also marked differences between the characteristics of girls' and boys' friendships, family relations, and academic and deviant behavior. Notably in terms of differences, girls tend to develop fewer and more close-knit friendships than boys whose friendships are more diffuse and less intimate (Kandel, 1978; Leaper, 2013). Also, parents tend to exert more monitoring and rule-setting for girls than for boys (Stattin & Kerr, 2000). Generally, boys also tend to show higher levels of delinquent behavior, aggression and lower levels of academic success in terms of grades (Lindeman, Harakka &

Keltikangas-Jarvinen, 1997; Rose & Rudolph, 2006). In comparison, girls have been found to show higher levels of prosocial behaviors and academic compliance (Marks, 2000; Masten, Juvonen, Spatzier, 2009; Downey & Vogt Yuan, 2005). That being said, research also presents similarities in the ways in which girls and boys are influenced by peers and both genders have been shown to benefit in similar ways from parental monitoring (Bendezu, Pinderhugues, Hurley, McMahon, Racz, 2018). Moreover, and importantly in the context of this study, boys and girls have been found to be similarly influenced by perceived social norms (Masten, Juvonen, Spatzier, 2009). As such, although we investigate the extent to which the tested models are generalizable to across genders in both studies, we do not expect gender differences to emerge.

CHAPTER II

NORMATIVE BELIEFS : UNDERLYING MECHANISMS IN THE RELATION BETWEEN FAMILY AND FRIEND INFLUENCES AND PSYCHOSOCIAL ADJUSTMENT IN EARLY ADOLESCENCE (STUDY 1)

Normative Beliefs: Underlying Mechanisms in the Relation Between Family and Friend Influences and Psychosocial Adjustment in Early Adolescence

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Résumé

Cette étude vérifie si les perceptions des adolescents concernant les normes du groupe de pairs en matière de consommation de psychotropes et d'engagement scolaire influencent leur comportement au fil du temps. En particulier, nous avons émis l'hypothèse que la perception des normes véhiculées dans le groupe de pairs, telle que mesurée en 7e année, est une variable médiatrice de la relation entre le comportement des amis et les connaissances parentales en 6e année et l'adaptation des adolescents en 8e année. Les participants étaient 1278 élèves recrutés en 6e année dans 8 écoles publiques du Nord-ouest de la région du Pacifique aux États-Unis (45,5% de garçons, 78,2% de descendance européenne). Les analyses de modélisation par équation structurelle ont montré que la perception des normes du groupe de pairs en 7e année était un facteur prédicteur significatif de l'adaptation des adolescents en 8e année. La perception des normes du groupe de pairs concernant l'engagement scolaire a médié la relation entre les connaissances parentales en 6e année et l'engagement scolaire en 8e année. Parallèlement, la perception des normes du groupe de pairs entourant la consommation de psychotropes a été un médiateur significatif de la relation entre la consommation des amis en 6e année et la consommation de psychotropes de l'adolescent en 8e année. Ces résultats soulignent l'importance de l'interprétation subjective que font les adolescents de leur environnement social pour prévoir leur adaptation future. Notre étude souligne la nécessité de prendre en compte la perception des normes dans le contexte des interventions en milieu scolaire qui encouragent les jeunes à faire des choix comportementaux positifs.

Mots clés : Normes sociales perçues; consommation de psychotropes; engagement scolaire; connaissances parentales; influence des amis; modélisation par équation structurelle

Abstract

This study tests whether adolescents' perceptions of peer group norms regarding substance use and school engagement influence their behavior over time. Specifically, we hypothesized that perception of peer group norms as measured in Grade 7 mediates the relation between friends' behavior and parental knowledge in Grade 6 and adolescent adjustment in Grade 8. Participants were 1278 students recruited in Grade 6 from 8 public middle schools in the Pacific Northwest of the United States (45.5% male, 78.2% of European decent). Structural equation modeling analyses controlling for baseline levels of outcome variables showed that perceptions of peer group norms in Grade 7 were significant predictors of adolescent adjustment in Grade 8. Perceptions of peer group norms surrounding school engagement significantly mediated the relation between parental knowledge in Grade 6 and school engagement in Grade 8. Meanwhile, perception of peer group norms surrounding substance use significantly mediated the relation between friend substance use behavior in Grade 6 and adolescent substance use in Grade 8. These findings point to the significance of young adolescents' subjective interpretations of their social environment in predicting their future adjustment. Our study highlights the need to take norm perception into account in the context of school-based interventions that foster young adolescents' ability to make positive behavioral choices.

KEY WORDS: Perceived social norms; substance use; school engagement; parental knowledge; friend influence; structural equation modeling

6.1 Introduction

The transition from elementary to middle school demarcates a developmental shift during which youth navigate new academic and social challenges. Larger schools, less intimate relationships with teachers and heightened expectations for student autonomy are characteristics that contrast the middle school context from the often more personal and structured elementary school environment (Eccles, Lord, & Buchanan, 1996; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). Simultaneously at this age, young adolescents begin to spend less time with family and more time in unsupervised activities outside of the household with friends (De Goede, Branje, & Meeus, 2009; Steinberg & Silverberg, 1986). Correspondingly, early adolescent peer experiences in general, and friendships in particular, become more complex and influential (Berndt, 1982; Brown, 2004; Brown & Larson, 2009). Research demonstrates increased susceptibility to the influence of schoolmates in middle school students, in comparison with younger children and older adolescents (Berndt, 1979; Brown, 2004; Steinberg & Silverberg, 1986). Young adolescents who benefit from protective factors like positive relationships with their parents and a network of well-adjusted friends usually have a smooth transition into their new schools and adolescence (Eccles et al., 1993). However, for vulnerable youth, the new educational and social demands that stem from the integration into an unknown academic setting may place them at risk for deviant peer affiliation, school failure, escalating behavior problems, which in turn may lead to marginalization in the school and community later in life (Dishion, Ha, & Véronneau, 2012; Reinke & Herman, 2002).

6.2 Early adolescence : A period of change and risk

A number of behaviors present in middle school are identified as strongly predictive of future school success and adjustment in adulthood. For instance, active school

engagement has been shown to be a critical underlying factor of student achievement over time. Behavioral engagement in school refers to students' attending classes on time, completing academic work in class, completing homework assignments and adhering to school rules (Fredricks, Blumenfeld, & Paris, 2004). Engaged students earn higher grades and display better psychosocial adjustment to school than disengaged students, who are more likely to experience academic failure, dysfunctional school behavior and school dropout (Fredricks et al., 2004; Klem & Connell, 2004; Marks, 2000; Wang & Eccles, 2012). Identifying the factors that help maintain active engagement at this age is important because for a significant number of students, a decline is observed in behavioral engagement in middle school (Dotterer, Lowe, & McHale, 2014; Marks, 2000).

In addition, an increase in the prevalence of problem behaviors such as substance use is noted during early adolescence (Bauman & Phongsavan, 1999; Lacourse et al., 2002). In an American nationally representative sample of adolescents, 34.1% of adolescents reported early (before age 15) use of both alcohol and marijuana or of both tobacco and marijuana (Moss, Chen & Yi, 2014). In a province-wide survey in Québec, 55% of high school students reported alcohol consumption with more than 25% reporting onset of use before the age of 14 (Traoré et al., 2018). Initiation of substance use in early adolescence is considered as a major predictor of the development of substance use disorders later on which is subsequently associated with a host of socio-economic and health related difficulties (Behrendt, Wittchen, Höfler, Lieb, & Beesdo, 2009; Palmer et al., 2009; Winters, Stinchfield, Latimer, & Lee, 2007). Substance use, including use of alcohol, tobacco and cannabis, at this age is also associated with a host of short-term social and academic difficulties that further increase the long-term risks associated with early use. For instance, substance use in young adolescence is associated with deviant peer affiliation, aggressive delinquent behaviors, school absenteeism, school dropout, low academic achievement, and low levels of educational attainment (Diseth & Samdal, 2015; Ellickson et al., 2001; Fergusson et al., 2002; Stiby et al., 2015; Verweij, Huizink,

Agrawal, Martin, & Lynskey, 2013). Considering the immediate and long-term consequences of substance use in early adolescence, research aiming to inform effective and targeted prevention programs for this age-group is necessary.

Understanding the contribution of the social environment to psychosocial maladjustment in the teenage years is critical for future efforts to promote students' success in middle school and beyond. Upon entering the novel middle school environment and undergoing pubertal changes, young adolescents strive to fit and embed themselves within groups of like-minded peers (Berndt, 1999; Dishion, Ha & Veronneau, 2012; Steinberg, 2008). At this age, a developmental period during which peer affiliation and acceptance are paramount, knowing and understanding what is socially normative is likely to be particularly influential when making behavioral decisions (Coley, Lombardi, Lynch, Mahalik & Sims, 2013; Kinsman, Romer, Furstenberg, & Schwarz, 1998; Mrug & McCay, 2013). As illustrated in Figure 4.1, this study investigates (a) how parents and friends influence young adolescents' appraisal of the social norms that may inform their behavioral choices later down their middle school path, and (b) whether young adolescents' normative beliefs do, in turn, influence their school behavior over time.

6.2.1 Perception of peer group social norms

Through the actions, attitudes, and behavioral choices of their members, peer groups communicate information about what is socially accepted by its membership (Borsari & Carey, 2001). Thus, by observing how others typically behave and by being attuned to which behaviors are socially approved of, individuals can effectively determine how to act in such a way that they would most likely get their peers' approval and benefit from the safety offered by their group affiliation (Cialdini, Reno, & Kallgren, 1990). In early adolescence, a developmental period during which peer affiliation and

acceptance are paramount, knowing and understanding what is socially normative is likely to be particularly influential when making behavioral decisions (Coley, Lombardi, Lynch, Mahalik & Sims, 2013; Kinsman, Romer, Furstenberg, & Schwarz, 1998; Mrug & McCay, 2013).

The concept of norms has been defined in various ways in psychological research. One important distinction is the one between objective norms that exist at the collective level, and individuals' subjective perceptions of those norms (Lapinski & Rimal, 2005). One way researchers can assess group norms is by applying an objective measure of a certain behavior within a group of individuals and estimating the mean or median measure for that behavior. In contrast, when directly asking individuals about the norms that exist in their group, researchers are essentially tapping into their perception of the norm (Rimal & Real, 2003). Perceived norms thus exist at the individual level, and are the result of subjective construal processes (Lapinski & Rimal, 2005). The discrepancy between objective norms and perceived norms is exemplified by results from studies that demonstrate that college students tend to overestimate alcohol consumption norms among their peers by assuming that their peers drink more frequently and drink larger quantities of alcohol than they actually do (Borsari & Carey, 2003). Research demonstrates that perceived friend and peer behavior is more strongly associated with individual behavior than measures of actual friend or peer behavior (Iannotti, Bush, & Weinfurt, 1996).

Another conceptual distinction central to social norm research is between descriptive and injunctive norms. Injunctive norms refer to one's perceptions of what is expected by others and motivate action through the potential social rewards or punishments associated with a behavior. Descriptive norms refer to the typical behavior or prevalence of a behavior within a social group. By speaking to what is done by the majority, descriptive norms suggest which actions are most usual in a particular situation (Cialdini et al., 1990; Kallgren, Reno, & Cialdini, 2000; Reno, Cialdini, &

Kallgren, 1993). Although certain studies suggest that injunctive norms play a stronger role in influencing behavior, descriptive norms remain worthy of further investigation in that they offer insight into the influence of norms in specific circumstances (Henry et al., 2000). In fact, in contrast to injunctive norms which require a deeper understanding of the social dynamics, values and expectations within a group, descriptive norms are easier to detect (Cialdini et al., 1990; Reno et al., 1993). Also, their role is different from that of injunctive norms, as they function as a heuristic on which to base cognitively effortless and efficient behavioral decisions (Shah & Oppenheimer, 2008; Stok, de Ridder, de Vet, & de Wit, 2014).

Based on this social norm framework, this study targets descriptive norms to evaluate the influence of peers in a developmental period during which new types of behaviors emerge (e.g., substance use, self-directed learning activities) and in which friendships based on different social dynamics begin to develop. It is likely that descriptive norms are highly influential in this period of transition and of social unknowns. Perceived descriptive norms have been shown to influence older adolescent and college-aged students' behavioral choices in numerous areas. For example, studies repeatedly show that students who perceive greater prevalence of drinking behaviors among peers are more likely to engage in binge drinking (Perkins, Craig & Perkins; 2011; Song, Smiler, Wagoner, & Wolfson, 2012; Teasdale, Stephens, & Sloboda, 2008). Perceived social norms have also been shown to encourage or discourage active participation in learning activities at school. In fact, a decline in perceived norms for academic engagement and an increase in perceived norms for academic disengagement has been observed between Grades 4 and 8 by Galván, Spatzier and Juvonen (2011). These authors suggest that in school environments in which academic achievement and effort are not valued, students may not want their peers to know that they work hard in school and may be likely to downplay their effort, achievement and school-related goals. Students may thus perceive that school engagement is not as normative as it is in reality. Research has also shown a link between students' perception of their classmates'

school involvement and their own grades, number of absences and interest in school by the end of the school year (Moos & Moos, 1978).

Hence, perception of social norms is a psychological process through which the outside world comes to influence adolescents' behavioral choices. However, little is known of the underlying mechanisms that may lead some young people to have different perception of the same objective norm. This study investigates how two key social influences in young adolescents' lives, friends and parents, may contribute to shaping their individual perceptions of norms in their peer group regarding substance use and school engagement, and how these normative beliefs influence their own behavior over time.

6.2.2 Peer and parental influence

At all ages, friends are more alike in their attitudes and behaviors than non-friends (Kandel, 1978). Friendships tend to be formed based on a selection process through which individuals associate with peers who are similar in interests and activities. Subsequently, the qualities that first attract individuals to one another are often reinforced through socialization processes if the friendship is maintained (Hartup, 1996; Kandel, 1978). Upon entering middle school, young adolescents usually form new friendships and likely encounter various opportunities to interact with different others—pro-social peers as well as those potentially involved in deviant or rule-breaking behaviors. Through exposure to and learning of a certain set of values and attitudes, youth who associate with individuals who engage in problematic behaviors are likely to have greater opportunity to also become involved in such acts over time (Urberg, Luo, Pilgrim, & Degirmencioglu, 2003). In fact, members of adolescent peer groups display parallel levels of academic achievement and substance use as well as other characteristics such as wellbeing, aggressive behavior and school dropout status

(Altermatt & Pomerantz, 2005; Cairns, Leung, Gest, & Cairns, 1995; Dishion, Nelson, & Bullock, 2004; Kandel, 1978; Kobus, 2003; Maatta, Stattin, & Nurmi, 2006; Oxford, Oxford, Harachi, Catalano, & Abbott, 2001; Ryan, 2001; Tucker, Edelen, Ellickson, & Klein, 2011; Véronneau & Dishion, 2011). This study explores whether the characteristics of young adolescents' close friends shapes the subjective way in which they perceive social norms in their larger peer context in school and whether this perception acts as an underlying mechanism that explains how friends impact youth behavior and psychosocial adjustment over time.

Despite the growing role friends play in young adolescents' lives, the family sets the stage for the socialization that occurs outside of the home and continues to influence youth throughout adolescence and beyond (Henry, Tolan, & Gorman-Smith, 2001; Steinberg & Silverberg, 1986). Hence, if hypothesized that friends' characteristics play a role in influencing how one perceives wider peer-group social norms, family characteristics likely also play a role in shaping young adolescent social perception. This study focuses on a particularly influential aspect of the parent–child relationship that impacts young adolescent social and behavioral adjustment: parental knowledge.

Parental knowledge, a dimension of parental monitoring, refers to the extent to which parents are aware and informed about their children's life, as a result of seeking out and/or receiving information on their children's day-to-day activities and social interactions. Studies have shown that parental knowledge mitigates an array of problematic behaviors in adolescence, including alcohol consumption, illicit drug use and internet gambling (Clark, Shamblen, Ringwalt, & Hanley, 2012; Curtner-Smith & MacKinnon-Lewis, 1994; Fallu et al., 2010; Fosco, Stormshak & Dishion, 2012; Lac & Crano, 2009; Martins, Storr, Alexandre, & Chilcoat, 2008; Tucker et al., 2011). Parental knowledge is also associated with positive outcomes such as school engagement and academic achievement, and is related to higher self-esteem and self-efficacy (Alfaro, Umaña-Taylor, & Bámaca, 2006; Kilian, Hofer, & Kuhnle, 2013;

Lowe & Dotterer, 2013). Importantly, parental knowledge is also related to the quality of their relationship with their child, in part because both parents' expression of interest in their child's activities and social experiences and child's willingness to disclose such information are central components observed in supportive, warm and trusting relationships (Rote & Smetana, 2018, Stattin & Kerr, 2000). Also, by demonstrating interest in their child's activities and whereabouts outside of the home, parents communicate to them that they are concerned about them their wellbeing (Dishion & McMahon, 1998). In sum, when parents are actively involved and genuinely interested in their child's life, they foster open sharing of information leading to enhanced opportunities to gain knowledge of their child's wellbeing (Stattin and Kerr, 2000). Assessments of parental knowledge thus represent heuristic measures that help capture, in a simple way, the end result of a complex set of interactions between adolescents and their parents.

More specifically, parent–child interactions that promote parental knowledge include open child disclosure in response to parental interest. Such exchanges may create opportunities for parents to adopt preventative parenting practices such as providing appropriate feedback about the possible consequences of their choices and behaviors, offering encouragement for prosocial behavior, and engaging in rule-setting. Open and regular communication between parents and their young teenagers likely gives rise to occasions for parents to discuss with their child about their perceptions of their classmates' behavior and potentially correct their misperceptions of peer group norms. For example, in response to a young adolescent who complains that no one else has to stay in on a weeknight to complete homework, a parent may explain that in fact, most kids of his or her age do the same. In this manner, we hypothesize that parental knowledge and the communication and relational stability that it fosters may contribute to shaping youth perception of social norms.

Although much research has focused on the numerous ways in which friends and family independently influence youth school engagement and substance use, more studies are needed that seek to explain how these exert influence to impact youth behavioral outcomes. This study aims to contribute to the literature and inform prevention programs that mitigate risk and promote adjustment in early adolescence.

6.3 This study

The general model inspiring our hypotheses is presented in Figure 2.1. Consistent with the socialization hypothesis (Kandel, 1978), we expect that friends' school engagement and substance use in Grade 6 will be associated with participants' engagement in these same behaviors by Grade 8, after controlling for participants' baseline behaviors. Importantly, we predict that participants' perceptions of norms around substance use and school engagement in their peer group will mediate such associations. We expect that parental knowledge will also be associated with participants' behaviors by Grade 8 and that norm perception will also mediate with association.

Our specific hypotheses are the following. First, we expect that having friends who use more substances in Grade 6 relative to their peers will lead to perceiving that substance use is a normative behavior among peers in Grade 7, and that such perception will subsequently predict an increase in youth substance use by Grade 8. Second, we expect that having friends who display high levels of school engagement in Grade 6 will lead to perceiving that school engagement is normative among peers in Grade 7, which will subsequently predict an increase in school engagement by Grade 8. To be clear, we do not expect that friends' substance use in Grade 6 will affect adolescents' perception of school engagement norms in Grade 7 to any significant extent, nor that friends' school engagement in Grade 6 will significantly affect adolescents' perception of substance use norms in Grade 7. Thus, we do not hypothesize cross-over effects in adolescents'

norm perceptions in Grade 7 nor outcomes in Grade 8. Third, we expect that high levels of parental knowledge in Grade 6 will be associated with perceiving that substance use is an uncommon behavior and that school engagement is commonplace among peers in Grade 7, which should in turn lead to higher youth adjustment (both low substance use and high academic engagement) by Grade 8. As a last step, potential differences with regards to gender will be examined using multiple group analyses.

6.4 Method

6.4.1 Participants

The study includes 1,278 participants recruited in eight middle schools in the Pacific Northwest of the United States. Participants were assessed at three times: in Grade 6 (11 years old), Grade 7 (12 years old), and Grade 8 (13 years old). Of the targeted students, 74% participated in the study and the retention rate from Grade 6 to 8 was 82%. The sample consisted of 45.5% males and participants were primarily of European decent (78.2%). The minority groups included Hispanic/Latino (4.5%), American Indian (3.3%), Asian American (3.1%), Pacific Islander (1.5%), African American (1.2%), mixed ethnicity (4.7%), and other or unknown ethnicity (3.6%). Most participants lived in two-parent families (70.8%); 13.9% lived in single-parent families, 13.1% lived in shared custody and 2.1% lived in other arrangements. Although no information on family income was collected, the majority of participants lived in middle-class families.

6.4.2 Instruments

All predictors were assessed in Grade 6, as well as baseline measures of our outcome variables and mediators (control variables). Mediators (perception of peer group norms for substance use and for school engagement) were assessed in Grade 7. The outcome variables were assessed in Grade 8.

The Perception of Peer Group Norms Questionnaire (Marshall-Denton, Véronneau, & Dishion, 2016) was used to measure our mediators. It is composed of 17 items divided into two sections: the perception of positive peer group norms (8 items, $\alpha = .84$) and the perception of negative peer group norms (9 items, $\alpha = .88$). For the present study, two subscales were created to assess students' perceptions of substance use norms and school engagement norms among their classmates. Items for each subscale were chosen based on their similarity in subject matter to items in subscales used to assess the adolescents' own substance use and school engagement levels. The stem question asks participants to rate, on a 6-point Likert-type scale ranging from 0 (none) to 5 (almost all), how many students in their class participate in different activities or behaviors. The perception of substance use norms subscale is composed of the following three items pulled from the negative peer group norms subscale in the original scale ($\alpha = .88$): "May have tried or use tobacco," "May have tried or drink alcohol" and " May have tried or use marijuana," with a reliability of $\alpha = .88$. The perception of school engagement norms scale is composed of the following four items pulled from the positive peer group norms subscale in the original scale ($\alpha = .86$): "Set goals for school success", "Complete homework", "Treat teachers with respect" and "Treat other students with respect", with a reliability of $\alpha = .86$. Mean scores were computed for each subscale. The subscales created for this study present adequate internal consistency reliability coefficients (Cronbach's α) and do not differ significantly from the coefficients of the validated original subscales.

The School Engagement Scale is a 6-item scale from the Student's Self-Report Survey (SSRS: Dishion & Stormshak, 2001). Its purpose in this study is to assess our school

engagement outcome. Participants are asked to indicate on a 6-point Likert-type scale ranging from 0 (never, almost never) to 5 (always, almost always) how often they demonstrate engagement in their studies (e.g., complete my homework and assignments on time; cooperate with teachers; participate in sports or another organized activity). The mean score of all six items was computed and an acceptable reliability of $\alpha = .73$ was achieved.

The Student Substance Use Scale is a 2-item scale from the SSRS (Dishion & Stormshak, 2001) which assesses our substance use outcome. Participants are asked to indicate how many cigarettes they have used in the past month. The scale ranges from no cigarettes (0) to 8 cigarettes (8) and then jumps to from 1 pack (9) to more than 31 packs (24). Participants are also asked to indicate, from no drinks (0) to 41 (14) or more drinks, how many alcoholic beverages they have consumed in the past month. Because each item was based on a different, non-continuous scale, scores were standardized before combining them together to increase ease of interpretation. Next, a mean score of responses to both items was computed ($r = .39$).

The Parental Monitoring Knowledge Scale is also taken from the SSRS (Dishion & Stormshak, 2001), and was used to measure parental knowledge as an independent variable in the model. The 4-item scale assesses participants' perceptions about their parents' knowledge about and concern for their activities and whereabouts. Participants answered on a 5-point scale ranging from 0 (never or almost never) to 4 (always or almost always). Items asked participants how often in the past three months did at least one of their parents: know what the participant was doing when he/she was away from home; know where the participant was after school; have a pretty good idea about the participant's plans for the coming day; have a pretty good idea about the participant's interests, activities, and whereabouts. The mean score on all four items was computed. The scale demonstrates a reliability of $\alpha = .82$.

The Peer Nomination Instrument (Coie, Terry, Zakriski, & Lochman, 1995) is a sociometric questionnaire that asks participants to circle the name of up to three peers whom they consider to be their best friends based on a roster of all their classmates, who are also participating in the study for the most part. By identifying participants' best friends, it is possible to use their own self-reported data about their substance use and school engagement (as described above) and to use such data as predictor variables in our model. This study uses data based on reciprocal friendships: participants were considered to have a reciprocal friend when a classmate whom they named as a best friend also named them back. An average score for up to three reciprocal friends was computed. Reciprocal friendship was chosen as an assessment of friendship over simple one-way peer nomination because reciprocally named friends are likely to be closer and thus more influential to one another than unilateral friends (Aloise-Young, Graham & Hansen, 1994). Participants who had no reciprocated friends were retained in the analyses because the full information maximum likelihood procedure used to handle missing data (more on this topic below) still allows them to contribute to estimating parameters of the model that do not involve friends' behaviors.

6.4.3 Procedure

Participants were recruited at the beginning of Grade 6 which represents their first year of middle school. With the approval of school principals, a consent form providing information about the study was sent by the school to the parents (or guardians) of targeted participants. Parents and their child were asked to sign and return the form to the school. Research assistants administered the questionnaires and explained the study to the participating students. Participants were informed of the confidential nature of their data and that they could withdraw from the study at any moment. Teachers were asked to leave the classroom for the duration of the completion of the survey. All participants were allocated 30$ for their participation at each assessment.

6.4.4 Analytic strategies

Structural equation modeling was used to evaluate whether the data adequately fit the hypothesized model using Mplus 8.0. The longitudinal design and the inclusion of statistical control for baseline levels of outcome variables and of mediators strengthen the study design by allowing for the analysis of change over time in the outcomes of interest. Models were run using the maximum likelihood estimation with robust standard errors (MLR), which is robust to non-normality and non-independence of observations (Kline & Connell, 2004). The model allowed for correlations between variables from the same measurement times. The model was deemed to have adequate fit if the Comparative Fit Index (CFI) was > .95 and the root mean squared error of approximation (RMSEA) was < .06 (Hu & Bentler, 1999). Good model fit is usually also indicated by a non-significant chi-square value. A non-significant chi-square value is also expected, although this index is highly sensitive to sample size and may be overly conservative when working with a large sample, which is the case in this study. For this reason, chi-square statistics are reported, but we give priority to other fit indices when evaluating model fit (Schermelleh-Engel, Moosbrugger, & Müller, 2003). Tests of indirect effects were run using bootstrap with 2000 iterations.

Gender differences were evaluated using measurement invariance testing based on multiple group analyses. Model fit was compared between an unconstrained model (all regression coefficients free to vary across genders) and a constrained model (regression coefficients constrained to be equal across genders). Because the goal of the multiple group analysis was to confirm the invariance of the mediation pathways, correlations between variables measured at the same time were not constrained across genders. The significance of difference between nested models is established based on difference

between CFI scores. A CFI difference smaller than 0.01 is considered as non-significant (Cheung & Rensvold, 2002).

6.5 Results

6.5.1 Preliminary analyses

Missing data. Across the variables included in the study, the mean percentage of missing data was 25.01% (range = 16.6%–43.2%). Variables pertaining to friend behavior (friend substance use and friend school engagement) displayed the highest levels of missing data due to the fact that the measurement of friends' characteristics is based on reciprocal friendships (friend substance use: 43.2%, friend school engagement: 41.1%). Our strict method of friendship identification, while allowing for a more valid assessment of true friendship than simple one-way peer nominations, may lead to missing data issues due to the fact that certain participants may only nominate friends who do not nominate them back.

As indicated by a significant Little's Missing Completely at Random test, $\chi^2(101) = 286.72$, $p < .001$, missing data were not completely random. The patterns of missingness were explored in regards to the amount of missing data by calculating the number of variables with missing values for each participant. Next, we computed correlations between participants' total number of missing values and their scores on other measured variables. Missing data were more common among participants who reported high levels of substance use ($r = .07$, $p < .05$), low levels of school engagement ($r = –.19$, $p < .01$), and low levels of parental knowledge ($r = –.09$, $p < .01$) in Grade 6. Missing data were also more common among students who perceived high levels of substance use norms ($r = .08$, $p < .01$) and low levels of school engagement norms ($r =$

–.07, $p < .05$) in Grade 7. Finally, missing data were more common among those with low school engagement in Grade 8 ($r = –.08$, $p < .05$) as well as among male participants ($r = –.09$, $p < .01$)

Covariance coverage ranged from 0.51 to 1.00. As briefly mentioned earlier, full maximum likelihood was used within Mplus 8.0 to estimate model parameters on the basis of all available information from each participant. Participants with occasional missing data were thus retained in analyses, and estimated parameters were adjusted by the software to be more representative of the full sample, including participants who did not provide full data. This technique is regarded as an efficient way to analyze data from samples with moderate levels of missing data like ours, and is considered adequate for analyzing data that are not missing completely at random, as long as the predictors are included in the model (Enders, 2010; Widaman, 2006).

Descriptive Statistics and Correlations. Correlations between all variables are presented in Table 2.1. This table also presents the number of participants with valid data for each variable, along with their mean, standard deviation, and normality indicators. Tests of normality show that although many of the variables are normally distributed as indicated by adequate skew (< 2.0) and kurtosis (< 8.0) levels defined by Kline (2011), several show skewness and kurtosis levels that exceed the recommended cutoffs. Specifically, variables that pertain to substance use show clear deviations from normality. The non-normality of substance use data was expected in relation to the nature of the expression of the phenomenon of substance use in early adolescence and also emerges in numerous other studies (Davis et al. 2019; Liddle, Dakof, Turner, Henderson & Greenbaum, 2008). Here, issues related to non-normal data distribution will be handled in primary analyses using maximum likelihood estimation with robust standard errors (MLR). MLR is a more conservative method relative to traditional maximum likelihood estimation (ML), but we preferred this method because of its robustness to non-normality. Previous studies have demonstrated that MLR is effective

in handling non-normality in data that presents with skew and kurtosis levels higher than those in this study. This suggests its appropriateness for use in this study (Yuan & Bentler, 2005; Savalei & Bentler, 2010). Bivariate correlations are significant and are in the predicted direction, with the exception of the correlation between friend substance use in Grade 6 with perception of school engagement norms in Grade 7 which was not significant.

Gender Differences. A series of one-way ANOVAs were used to examine gender differences. Girls report significantly higher levels of school engagement (Grades 6 and 8) and of parental knowledge than boys do. Girls also report perceiving higher levels of school engagement norms and have friends who report higher levels of school engagement, whereas boys display higher levels of substance use (Grade 6 and 8) (all Fs > 5.46, ps < .05).

6.5.2 Primary analyses

The hypothesized model provided an excellent fit to the data, χ^2 (12) = 14.84, p = .25 (*ns*), CFI = .99, RMSEA = .01. Standardized coefficients for regression paths are presented in Figure 2.2. Non-significant paths are omitted from the figure for parsimony, but were still estimated in the statistical model. Correlations between variables measured at the same time were also included in the model, but not presented in Figure 2.2 for parsimony. These correlations were significant and in the predicted direction presenting p-values ranging from .001 to .06.

Overall, perceiving that substance use is a normative behavior among peers in Grade 7 is predictive of increases in youth substance use between Grade 6 and Grade 8. Perceiving school engagement as a normative behavior in Grade 7 is predictive of increased school engagement in Grade 8. With regards to the predictors of young

adolescents' perceptions of social norms, parental knowledge and students' own levels of school engagement in Grade 6 were predictive of an increased propensity to view school engagement as normative in Grade 7. Meanwhile, friend school engagement had no significant relationship with perceived school engagement norms. On the other hand, friend substance use and students' own levels of substance use were predictive of an increased propensity to view substance as normative in Grade 7. Effect sizes are small and range from 0.11 to 0.19.

Gender invariance tests were conducted to determine whether differences in model fit were evident, which would suggest moderation effects based on gender. Tests for group differences in model fit revealed a significant difference between the constrained and the unconstrained models (CFI constrained = 0.95, CFI $\Delta < .01$). Based on modification indices, we found that the constraints imposed on the link between perceived school engagement norms in Grade 7 and school engagement in Grade 8 had to be released. The fit of this partially constrained model does not significantly differ from the unconstrained baseline model, (CFI $\Delta = .004$). This indicates that gender differences exist for this path, but not for the remaining regression paths. In fact, a significant longitudinal association between school engagement norms in Grade 7 and school engagement in Grade 8 exists for boys only (Boys: $\beta = .21$, $p < .001$ and Girls: $\beta = .003$, $p = .94$).

Tests of indirect effects were performed using confidence intervals based on the bias-corrected bootstrap method (MacKinnon, Lockwood, & Williams, 2004) to verify whether perceptions of peer group substance use and school engagement norms were mechanisms underlying an indirect association between friend and family predictors and psychosocial outcomes. Indirect effect tests show that perceiving that student engagement is a normative behavior among peers in Grade 7 mediates the relation between parental knowledge in Grade 6 and increased school engagement in Grade 8

(95% CI = .001 – .023, point estimate = .012). Meanwhile, perceiving that substance use is a normative behavior among peers in Grade 7 mediates the relation between friend substance use in Grade 6 and increased substance use in Grade 8 (95% CI = .002 – .021, point estimate = .012). As for Grade 6 adolescent behaviors, included as control variables, perception of student engagement norms in Grade 7 mediates the relation between student engagement in Grade 6 in Grade 8 (95% CI = .001 – .024, point estimate = .012) and perception of substance use norms in Grade 7 mediates the relation between substance use in Grade 6 and Grade 8 (95% CI = .001 – .046, point estimate = .024).

6.6 Discussion

The main objective of this study was to test whether young adolescents' perception of peer group norms played an explanatory role in the relation between friends' behavior and family relationships in Grade 6 and adolescent adjustment, including substance use and school engagement, in Grade 8. We expected that even when they share the same social setting (e.g., the same middle school), social experiences and individual characteristics that are unique to each adolescent may influence their propensity to interpret social surroundings in certain ways and that this impacts behavior over time.

Two hypothesized mediation effects were partially corroborated. Parental knowledge significantly predicts perceiving student engagement as a normative behavior, and this perception mediates the relation between parental knowledge and adolescent school engagement two years later for boys only. Meanwhile, having friends who engage in substance use significantly predicts perceiving substance use as a normative behavior among peers and this mediates the relation between friend substance use and adolescent substance use two years later for both genders. Friend school engagement in Grade 6 was unrelated to adolescent perception of social norms the following year.

6.6.1 Predictors of perception of peer group norms

Perception of social norms is subjective, and to further our understanding of the processes through which normative beliefs develop, we sought to examine how two major social actors in young adolescents' lives, friends and parents, impact how they perceive their social normative context at school. Our hypothesis that close friend behavior informs young adolescent perception of peer group social norms was supported with regards to substance use. However, having close friends who demonstrate high levels of school engagement was not predictive of perceiving school engagement as a normative behavior among peers a year later. In contrast to substance use, which largely occurs in group settings at this age, school engagement may be less directly observable to others because it involves either internal processes (setting goals for success, valuing learning) or activities that are often done alone (completing homework). Hence, when faced with a lack of information directly observable among one's friends, one may have to rely on other sources of information when trying to figure out norms in the wider social context, and use other heuristics to make quick and efficient predictions.

Results show that students' own school engagement was more predictive of their perception of school engagement norms than their friends' behavior, which was not a significant predictor of adjustment in Grade 8. This is coherent with False Consensus Effect Theory, which stipulates that individuals tend to be affected by an egocentric bias when estimating the behavior of others (Ross, Greene, & House, 1977; Prinstein & Wang, 2005). In line with this premise, results also show that this was true for perception of substance use norms, which was significantly predicted by adolescents' own levels of use, and not by friends' use. These results are coherent with those from

studies investigating college-aged drinking behaviors, which suggest that students who engage in more frequent consumption and binge-drinking behaviors are more likely to perceive their behaviors as normative within their wider peer group and thus estimate that higher consumption is more common than it is. Also, such an overestimation is subsequently predictive of increased use (Perkins, 2003, Perkins, Craig & Perkins, 2006). Still, our results do suggest that youth who associate with friends who are using substances are more likely to also perceive these behaviors as common among their peers, as compared with students who use little or no substances, or who associate with friends who use little or no substances. This may indicate that youth who engage in substance use behaviors likely partake in these with peers, which would expose them to increased opportunities to both observe them and participate in discussions about substance use. These results are also coherent with peer contagion theory because they highlight norm perception as a possible pathway through which deviant or risky behaviours are reinforced within friendhip groups (Dishion & Tipsord, 2011).

Our hypothesis that parental knowledge helps foster a perception that peer group social norms are in favor of school engagement was supported by our results, as having parents who display high levels of parental knowledge increases adolescents' perception of school engagement as a normative behavior among peers. Results of this study suggest that a pathway from parental knowledge to prosocial norm perception may happen through open sharing of information. Potentially, families in which parents demonstrate high levels of awareness, concern and supervision over their child's activities may also spend more time conversing with their adolescent. Conversations about school, friendships, peers and social activities may foster opportunities for parents to instill certain values and points of view in their child, and subsequently impact the way they interpret the world around them. Dyadic exchanges in information may offer opportunities for parents to gain knowledge of their youth's perceptions of his or her environment, and when necessary, offer nuance to generalizations and misperceived norms (Bacikova-Sleskova, Benka, Orosova, 2019). Greater adolescent

disclosure is also associated with relationships that are more supportive, warm and trusting, and with a perception of parents as being warm, accepting and supportive (Rote & Smetana, 2018). These relationship qualities are also associated with positive youth outcomes such as educational attainment, self-efficacy and school engagement (Bean et. al, 2003; Chen et. al, 2004; Parker & Benson, 2003).

Our results are coherent with those reported by Stattin and Kerr (2000), which emphasize the importance of reciprocal communication between parents and children. These authors more specifically indicate that the relation between parental knowledge and positive youth outcomes stems from the child's propensity to self-disclose to their parents and not from solicitation of information from the parents. Although measures of parental knowledge can be assessed through parent or child reports, it has been shown that child report of parental knowledge, as used in this study, is a more accurate and meaningful measure as parents may tend to overestimate the extent to which they know about their child's ongoings (Kerr & Statin, 2000; Laird, Petit, Bates & Dodge, 2003).

In contrast to studies proposing potential adverse effects from parental monitoring in adolescence, notably when parenting practices are perceived as controlling (Pomerantz, Moorman & Litwack; 2007), our results support the developmental perspective that parental knowledge plays a positive role specifically in young adolescence. This is coherent with work by Pomerantz and Eaton (2000) who, in concordance with the Stage-environment Fit Theory (Eccles et al. 1993), suggests that parental efforts to gain information and set limits on youth behavior has different effects at different ages. Rather than being experienced as controlling, parental monitoring in young adolescence may be seen by the child as a proof of parents' interest by the child. In contrast, the perception of parents' authority and knowledge as legitimate may decrease in middle or late adolescence (Cumsille, Darling, Flaherty & Martinez, 2006).

6.6.2 Perception of peer group norms as underlying mechanisms of social influence

Results of this study show that perception of peer group school engagement norms mediates the relation parental knowledge and adolescents' school engagement for boys only. Furthermore, perception of peer group substance use norms is a significant mediator in the relation between friend substance use and adolescent substance use for both genders. Hence, as hypothesized, perception of peer group norms, a subjective and psychological process, serves as an underlying explanatory mechanism of the relation between certain family and friend experiences and young adolescent outcomes. This suggests that interventions that aim at fostering academic and behavioral adjustment during the middle school years need to take into account not only social factors (family and friends), but also their psychological impact on adolescents' perceptions of social norms.

Our findings are consistent with those presented in past studies that have explored the influence of social norms on college students' alcohol consumption habits (Borsari & Carey, 2003), adult littering in public (Cialdini et al., 1990), children's consumption of fruit and vegetables (Stok, Ridder, Vet, & Wit, 2014), and bicycle helmet wearing (Lajunen & Rasanen, 2004). In all, these studies concur that social norms are powerful influents of behavior and demonstrate individuals' need to consider what behaviors are typical and therefore accepted among peers when deciding how to act. This study further serves to demonstrate the extent of this phenomenon in early adolescence, an age period during which fitting in and behaving normatively is particularly relevant.

Our findings also offer support for the theoretical utility of prevention programs that include social marketing approaches to behavior modification, that is, programs that aim to alter individuals' perceptions of peer group norms to reduce incidence of risk-taking behavior (Borsari & Carey, 2003; Morrongiello, Lajunen & Rasanen, 2013; Perkins et al., 1999; Stok, Ridder, Vet, & Wit, 2014). The aim of such programs is to modify behavior by correcting individuals' erroneous perceptions of social norms such

as inflated views of peers' alcohol consumption. While social marketing programs have been widely implemented in American colleges to curb binge-drinking behaviors, results of this study speak to the potential of exploring the efficacy of similar strategies to target substance use in young adolescence, a developmental period during which exploration in use commences and assumptions about normative use begin to form.

Our results also demonstrate the potential for using perception of social norms as a mechanism of change to promote positive behaviors such as engagement in school, in particular when considering that valuing of school effort may be publicly minimized and communicated as being "uncool," thus potentially influencing some middle school students to perceive school engagement norms as lower than they are in reality (Galván, Spatzier, & Juvonen, 2011). Social marketing campaigns that advertise that school effort and active participation in school is actually normative, if that is the case, may serve to correct erroneous perceptions and potentially bring youth to adjust their own behavior accordingly. Results of our study also point to the fact that interventions targeting social norms would benefit from including both targeted youth and the social actors in their lives; notably their friends and family who contribute to shaping their sense of social norms in the first place.

6.6.3 Gender differences

Overall, results point to significant similarities in the ways in which boys and girls' perceptions of social norms are informed by their parents and friends. That being said, results do show gender differences in relation to the influence of boys' perception of school engagement norms on their school engagement over time. Specifically, boys' propensity to perceive school engagement as more common among peers positively predicted change in their own school engagement the following year; a relation that did not emerge for girls whose school engagement was not informed by their perception of

their peers behavior. Conversely, the relation between perceived substance use norms and adolescent substance use over time was significant for both genders. Potentially, this discrepancy may relate to the fact that girls are generally more engaged in their studies than boys are (Marks, 2000) and may not feel the same need to look to the prevailing social norms to inform their behavior choices because of their higher intrinsic motivation to succeed. Boys may feel a stronger need to look outward to how the majority behaves when seeking information on how to act. This is consistent with findings by Shin & Ryan (2014) that suggest that boys, relative to girls, are more susceptible to the influence of their peers' endorsements of goals for academic effort and performance. Meanwhile, substance use appears to be a highly socially embedded activity for both boys and girls who, thus, may equally rely on perceptions of peer group norms when deciding how to behave.

6.6.4 Strengths and limitations

Some limitations of this study would be important to consider in future endeavors. First, parental knowledge was assessed using adolescent reports, which may not accurately reflect objective parental knowledge. However, as our main variable of interest pertained to adolescents' perceptions of social norms, adolescents' perceptions of their relationship with their parents, as captured by our monitoring questionnaire, are highly relevant and perhaps more relevant than objective measures of the latter. Moreover, as previously specified, youth-reported parental knowledge is considered by some as a more accurate assessment as parents may overestimate the extent to which they are aware of their child's life (Kerr & Statin, 2000; Laird, Petit, Bates & Dodge, 2003). Also, the measure used to assess substance use may not effectively tap into early adolescents' experiences as it more specifically examined use in the past month. A measure that assesses lifetime substance use may more accurately illustrate habits and experiences for youth of this young age group for whom substane use may not occur

on a monthly basis and still represents an important indicator of risk. Finally, the measures used were not validated instruments. Use of validated measures in future research would more optimize reliability and generalizability.

Also, due to the longitudinal design, missing data issues were noted. In general, missing data were more common among students who reported an overall at-risk profile. Missing data was also higher for our measures of friend characteristics due to the strict operationalization of friendship status. This limit was however counterbalanced by the rigor of the measure, which ensures that only established and reciprocal friendships were considered. Non-random missing values may limit the generalizability of our results; however, the use of FIML in Mplus to manage missing data minimized this risk, relative to the use of other popular missing-data management strategies such as list-wise deletion, mean substitution and single imputation (Enders, 2010; Widaman, 2006).

Nevertheless, this study possesses many strengths. First, the large number of participants helped us identify even small effects. In addition, the longitudinal design allowed for the statistical control of baseline levels of students' substance use and school engagement. The three-wave statistical design also allowed for control of baseline mediator variables, a best practice in mediation analysis. This enabled us to assess change in outcome variables as explained by changes in perception of peer norms over time. Moreover, the utilization of friends' own reports of their substance use and school engagement enabled us to avoid the problems associated with bias in participant reports of friend behavior and subsequent overestimation of similarities between participants and their friends (Prinstein & Wang, 2005). Another strength to this study is the inclusion of both friend and family variables, two pivotal social actors in young adolescents' lives. Hence, by considering simultaneously the direct and indirect influence of friends, family and young adolescents' personal interpretation of school social norms, this study takes a well-rounded view of the impact of youth's

social environments. Last, to date, research on normative influence in adolescence has largely focused on negative or risky behaviors (Eisenberg, Toumbourou, Catalano, & Hemphill, 2014; Perkins, Craig, & Perkins, 2011; Unger et al., 2000). By considering school engagement, a positive school behavior, along with substance use, this study enabled us to assess the positive ways in which youth are influenced by social norms.

6.7 Conclusion

In this study, we showed that perceived peer group social norms in middle school are significant predictors of early adolescent substance use and school engagement. These findings highlight the importance of taking into account young adolescents' subjective interpretations of their social environment, in the form of normative beliefs, when considering the various social influents that impact their behavioral choices. In fact, this study sheds light on a novel underlying mechanism through which friends and parents exert influence on young adolescents. By contributing to shaping adolescents' normative beliefs, these two dominant social actors impact youth's internal representations of the social world around them—representations that may have lasting effects on adolescents' behavior and psychosocial adjustment.

Table 2.1 Correlations and descriptive statistics

Variables	1	2	3	4	5	6	7	8	9
1. School engagement (Gr. 6)	_								
2. Substance use (Gr. 6)	-.25**	_							
3. Friend school engagement (Gr.	.30**	-.14**	_						
4. Friends' substance use (Gr. 6)	-.12**	.09**	-.29**	_					
5. Parental knowledge (Gr. 6)	.48**	-.37**	.20**	-.17**	_				
6. Perception of SE norms (Gr. 7)	.25**	-.09*	-.10**	-.02	.24**	_			
7. Perception of SU norms (Gr. 7)	-.12**	.25**	-.09*	.13**	-.09**	-.10**	_		
8. School engagement (Gr. 8)	.45**	-.17**	.21**	-.20**	.30**	.24**	-.22**	_	
9. Substance use (Gr. 8)	-.13**	.25**	-.07*	.11**	-.21**	-.10**	.29**	-.33**	_
N	1278	1278	837	837	1030	1069	1065	1076	1068
Mean	3.41	-.06	3.47	-.06	3.54	4.07	2.04	3.12	.03
Standard Deviation	.62	.50	.41	.63	.71	1.02	1.08	-1.18	.85
Skewness	-1.62	4.78	-1.36	3.60	-2.32	-.42	.76	2.73	3.80
Kurtosis	3.25	24.23	2.34	12.87	6.03	-.10	.64	1.37	16.87

Notes: SE is school engagement and SU is substance use. ** Correlation is significant at the 0.01 level,
* Correlation is significant at the 0.05 level

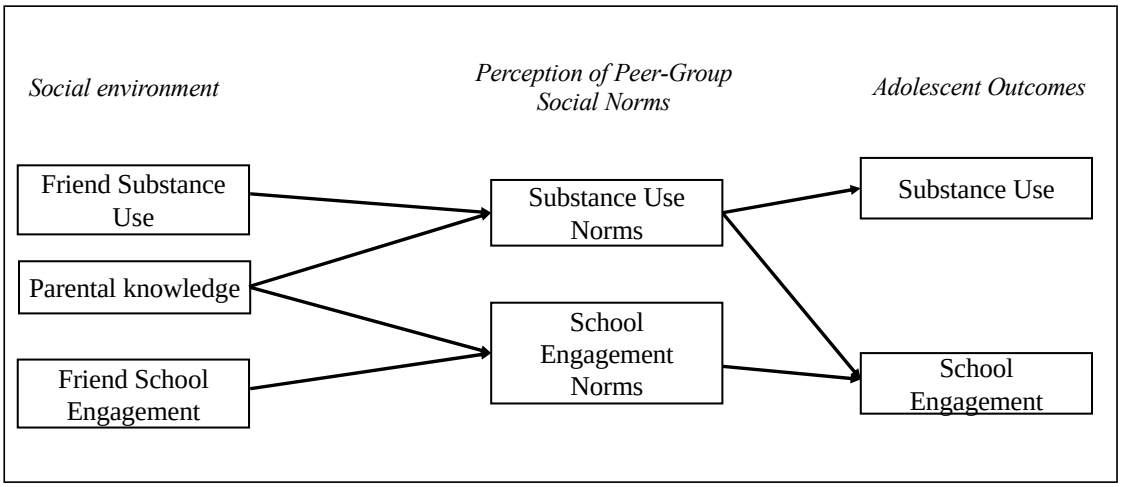
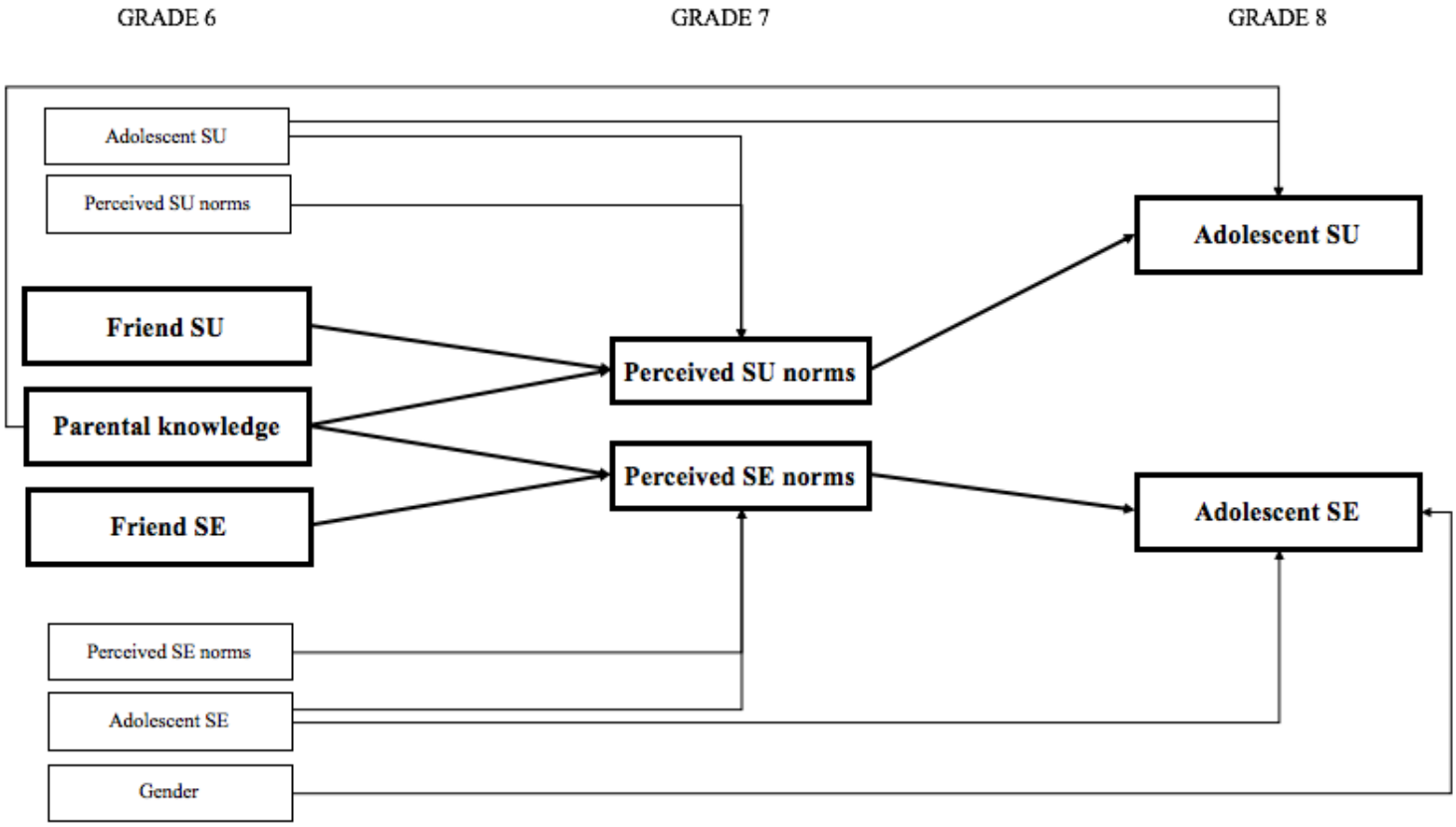
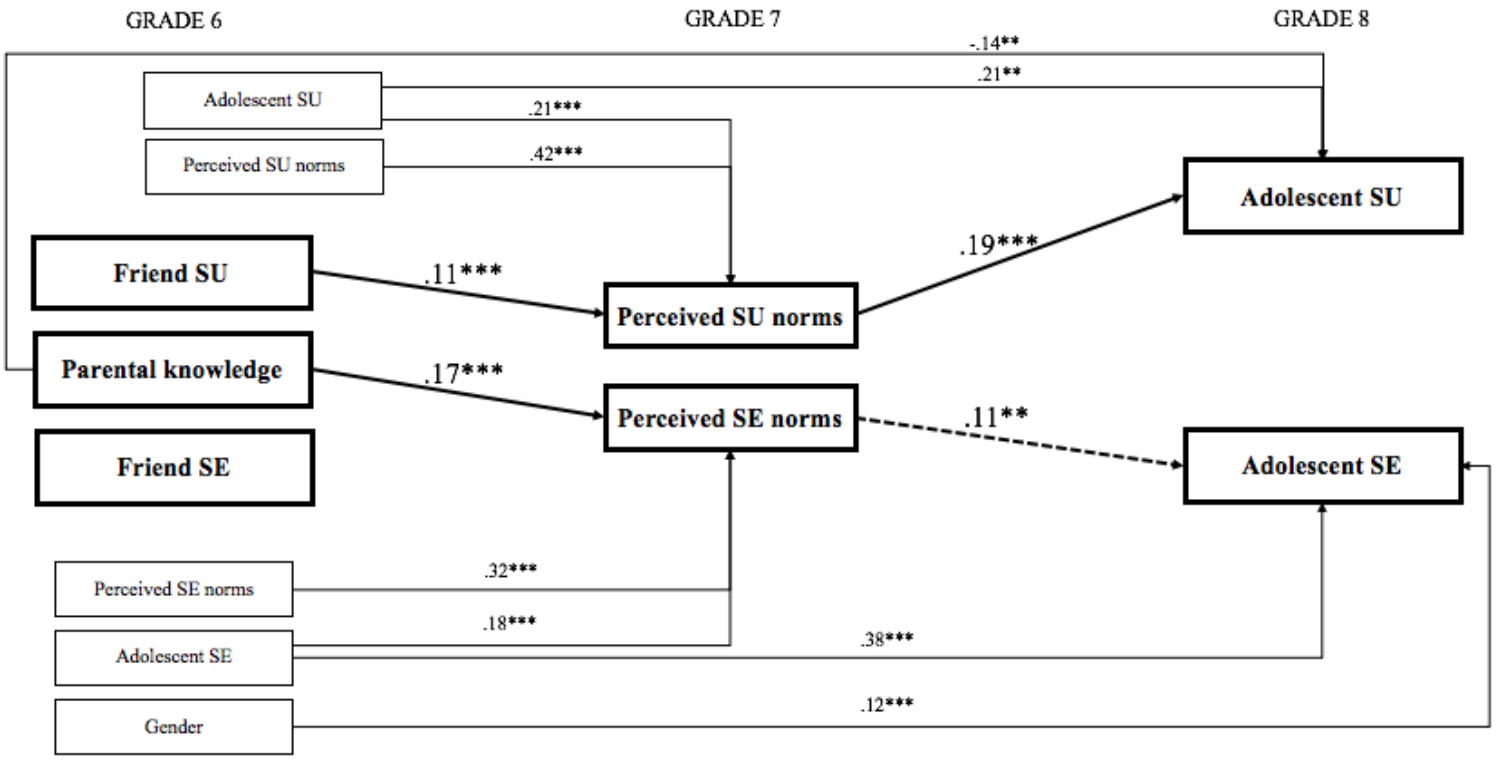


Figure 2.1 General model tested in Study 1



Notes: For reasons of parsimony, correlations between variables assessed at the same time of measurement were included in the model but omitted from Figure.

Figure 2.2 Hypothetical model testing the mediating role played by perceived social norms in the relation between family and friend influence and youth psychosocial adjustment



parsimony but were included in analyses. Correlations between variables measured at the same time were included in analyses but are not presented in figure for parsimony. Dotted line represents path with gender difference (Boys: β = .21, $p < .001$ and Girls: β = .003, $p = .94$). Fit indices are χ^2 (12) = 14.84, $p = .25$ (*ns*), CFI = .99, RMSEA = .01. *** $p < .001$, ** $p < .01$

Figure 2.3 Results of model testing the mediating role played by perceived social norms in the relation between family and friend influence and youth psychosocial adjustment

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CHAPTER III

BRIDGE FROM STUDY 1 TO STUDY 2

Article 1 explored the role parents and friends play as influents of young adolescents' perception of social norms. Perceived social norms were examined as mechanisms that underlie the association between parent and friend influence and youth school engagement and substance use over time. Article 2, presented in Chapter 4, seeks to expand the Theory of Social Normative Behavior by exploring the role played by parents and friends as potential moderators of youth susceptibility to the influence of perceived social norms.

In comparison to our first study, which includes both outcomes of interest within the same model, Article 2 more specifically examines only substance use, which yielded more substantial findings. Due to lack of significant results and in interest of parsimony, analyses pertaining specifically to school engagement will be presented in a separate chapter that follows Article 2. Moreover and also in comparison to our first study, Article 2 examines change in substance use over two time points, from age 12 to 13 years old. Data from the first year of study, when participants were 11 years old, was omitted from analyses due to the low baserate of substance use behaviors at this age, which was not suitable to the moderation analyses we propose.

CHAPTER IV

« BUT MOM, ALL MY FRIENDS DO IT » : THE MODERATING EFFECTS OF PARENTAL KNOWLEDGE AND FRIEND BEHAVIOR ON SOCIAL NORMATIVE INFLUENCE AND YOUNG ADOLESCENT SUBSTANCE USE (STUDY 2)

"But Mom All my Friends Do It": The Moderating Effects of Parental Knowledge and Friend Behavior on Social Normative Influenceand Young Adolescent Substance Use

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Résumé

Cette étude a pour objectif d'examiner l'influence de la perception des normes sociales dans l'émergence des comportements de consommation de psychotropes chez les jeunes adolescents et teste si les parents et les amis modèrent cette association. Tout d'abord, on émet l'hypothèse que le lien entre les normes sociales perçues par les adolescents et leur propre consommation sera amplifié chez ceux qui ont aussi des amis qui consomment. Deuxièmement, on suppose que les connaissances parentales peuvent contribuer à atténuer le rôle joué par les normes perçues sur la probabilité qu'un adolescent consomme des psychotropes. Nous nous attendons à ce que des interactions émergent à la fois transversalement et longitudinalement. Les participants étaient 1278 élèves recrutés en 6e année dans 8 écoles publiques du Nord-ouest de la région du Pacifique aux États-Unis (45,5% de garçons, 78,2% de descendance européenne). Les analyses principales consistaient en des régressions linéaires utilisant des termes d'interaction et conduites à l'aide de la modélisation par équation structurelle. Les résultats montrent que les connaissances parentales atténuent l'association positive entre le fait de percevoir les normes comme étant favorables à la consommation de psychotropes sur les comportements de consommation. Ces résultats sont significatifs dans les analyses transversales à 12 ans et à 13 ans. Le comportement des amis n'a ni amplifié ni affaibli la relation entre les normes perçues et les comportements de consommation de psychotropes. Les résultats corroborent l'importance que les normes sociales perçues jouent dans la prévision de l'usage futur de psychotropes et nous renseignent sur le rôle protecteur que tiennent les connaissances parentales pour atténuer la vulnérabilité des jeunes aux normes relatives à l'usage de psychotropes.

Mots-clés: Normes sociales perçues, toxicomanie, connaissances parentales, influence des amis, modération, facteur de risque, facteur de protection

Abstract

This study tests the role perceived social norms play in informing young adolescents' substance use behaviors, and verifies whether parents and friends moderate this association. We first hypothesize that perceived social norms will play an amplifying role on normative influence for those who also have friends who engage in substance use. Second, we hypothesize that parental knowledge may attenuate the association between perceived substance use norms and the likelihood that a teenager will use substances. We hypothesize that interactions will hold both cross-sectionally and longitudinally. Participants were 1278 students recruited at age 12 in 8 public middle schools in the Pacific Northwest of the United States (45.5% male, 78.2% of European decent). Primary analyses consisted of linear regressions using interaction terms conducted though structural equation modeling. Parental knowledge mitigates the influence of perceived pro-substance use norms on substance use behaviors cross-sectionally for 12- and 13-year-olds. Results corroborate the importance that perceived social norms play in predicting future substance use, and they provide evidence to the protective role parental knowledge plays in mitigating youth susceptibility to substance use norms.

Key words: Perceived social norms, , school engagement, parental knowledge, friend influence, moderationg, risk factor, protective factor

10.1 Introduction

During times of transition, social norms act as informative guideposts that signal what is done and approved of by most. While navigating changing schools, roles and even bodies, early adolescent susceptibility to peer influence peaks. Peer affiliation and acceptance are paramount at this age rendering one's understanding of what is socially normative particularly influential (Coley, Lombardi, Lynch, Mahalik & Sims, 2013; Kinsman, Romer, Furstenberg, & Schwarz, 1998; Mrug & McCay, 2013). Moreover, adolescents tend to be more prone to imitating peer behaviors that are risky, because at this age, risk behaviors or behaviors that are "against the rules" tend to be considered as exciting, pleasurable or beneficial in the short-term (Rivis & Sheeran, 2003). Learning more about how peer-group social norms influence smooth or strenuous transitions into adolescence is important as early adolescence is a pivotal developmental period in which engagement in certain risk behaviors have enduring effects into adolescence and beyond. This is especially true when considering substance use.

Consumption of alcohol and drugs in adolescence is predicative of substantial increase in use in the following years and through young adulthood. For those who do engage in substance use in adolescence, initiation and exploration tends to first begin in early adolescence, before the age of 14 years old (Substance Abuse and Mental Health Services Administration [SAMHSA], 2009). Results from a study using an American nation-wide representative sample shows that 31.4% of youngsters have consumed a combination of alcohol, tobacco or marijuana before the age of 15 Barry Moss, Chen & Yi, 2014). In the province of Quebec, 25% of adolescents reported to have consumed alcohol before the age of 14 years old (INSPQ, 2015). Research shows that the earlier youth begin to explore in alcohol use, the more at risk they are in life to experience alcohol related difficulties such as dependence, abuse, violence or motor vehicle accidents (Hingson, Edwards, Heeren, & Rosenblock, 2009). Because adolescent

drinking often occurs in social settings, it is important to understand the social norms that support and drive consumption among youth (LaBrie, Hummer & Pedersen, 2007).

While numerous studies and prevention programs identify perceived social norms as one of the strongest correlates of substance use on college campuses, it is likely that social norms also play a role in the emergence of substance use behaviors in younger populations. A small number of empirical studies have found peer group social norms to play a role in informing youth beliefs, attitudes and behaviors when it comes to partacking in drinking, smoking or drug use (Duan, Chou, Andreeva, Pentz, 2009; Roditis, Delucchi, Chang, Halpern-Felscher, 2016; Song, Smiler, Wagoner, & Wolfson, 2012). While these offer support to the importance of considering social norms in investigating youth substance use, less is known as to when and under what conditions social norms are most influential. Identifying the conditions under which social norms are impact behavior is important to inform existing theory, clarify inconsistencies in previous research and contribute to effective prevention efforts that aim to mitigate risk and reduce substance use prevalence among youth. In fact, research on social norms is predominantly cross-sectional limiting potential to test models that examine longitudinal associations such as moderators. Accordingly, the main goal of this study is to examine moderators that exacerbate or weaken the known link between social norms and youth substance use over time in early adolescence.

10.1.1 Perception of peer group social norms

Social norms are central factors underlying the use of alcohol and other substances in young people (Borsari & Carey, 2001). Conceptually, research distinguishes between descriptive and injunctive norms. Descriptive norms refer to the prevalence of a behavior within a group (how widespread the behavior is) and injunctive norms refer to the group's approval of said behavior. Both types of norms have been empirically

associated with numerous behavioral outcomes and populations, especially in the context of substance use (Cialdini et al., 1990; Kallgren, Reno, & Cialdini, 2000; Reno, Cialdini, & Kallgren, 1993). A critical factor in the known relation between descriptive norms and behavior is the reliable finding that perception of social norms is a subjective process and, in relation to substance use in particular, people tend to endorse exaggerated estimations of the norm relative to the actual prevalence of the behavior within the group (ex: believing that most drink more often and larger quantities than they actually do) (Lapinski & Rimal, 2005). For this reason, descriptive norms have been included as central components to widespread prevention programs implemented to reduce binge-drinking on college campuses (Borsari & Carey, 2003). Through social marketing and normative feedback strategies, these programs aim to correct students' misperceptions and exaggerated assessment of social norms surrounding alcohol consumptions. Although the latter yield promising short-term results in regards to positive behavior change as a response to normative feedback, long-term evaluations of the effectiveness of these programs have present mixed results indicating that additional factors should be considered in the norm-behavior relationship (Cislhagi & Heise, 2018).

To inform more effective interventions, the Theory of Social Normative Behavior (TSNB) proposes a model of normative influence that includes consideration of underlying cognitive mechanisms that moderate the extent to which descriptive norms influence behavior (Rimal, 2008). Specifically, it proposes that descriptive norms influence behavioral choices through their interaction with other cognitive and environmental factors. For example, the magnitude of the relationship between descriptive alcohol consumption norms and behavioral intentions to drink can be amplified by pro-drinking injunctive norms, by strongly identifying with the reference group, or by perceiving that benefits will come from drinking (Rimal, 2008). Beyond the three suggested moderators included in the TSNB, subsequent research in norm theory has explored the role played by individual factors, such as cultural

characteristics and self-identity, as moderators of the influence of social norms on behavior (Lapinski & Rimal, 2005).

This study aims to extend TSNB by evaluating social normative processes in early adolescence, a period when substance use behaviors first begin to emerge, and in which relationships with parents and friends are changing in terms of increased autonomy and intensity, respectively. It is likely that descriptive norms are highly influential in this period of transition and of social unknowns and that youth could benefit from effective prevention programs that harness the power of social norms to mitigate substance use at this age. We hypothesize explore the role played by two key social factors in young adolescence, notably, close friend substance use and parental knowledge, in the known relation between perceived norms on substance use. To alleviate the text, the phrase "pro-substance use norm" will be used henceforth to refer to a perception of substance use as being highly prevalent among peers.

10.1.2 Peer and parental influence in early adolescence

During adolescence, peers take on a heightened influence as yougsters strive to forge an identity that is separate from their parents. Beyond shaping youths' broader social normative context, peers also contribute to adolescents' behavior development more directly at the dyadic level through friendship. As children enter middle school and are presented with opportunities to meet new people, the composition of their friendship groups often changes. Initially, youngsters tend to select and associate with peers with whom they share interests, attitudes and behaviors (Hartup, 1996). These commonalities are subsequently reinforced over time through socialization processes if the friendship is maintained (Hartup, 1996; Kandel, 1978). One of the strongest and most consistent correlates of youth substance use is affiliation with substance using friends (Kobus, 2003; Oxford, Oxford, Harachi, Catalano, & Abbott, 2001; Tucker et

al., 2012). In fact, even when controlling for initial shared characteristics between friends (selection processes), members of adolescent friend groups display parallel levels of substance use and of trajectories of increased use overtime in adolescence (Monahan, Rhew, Hawkins, & Brown, 2014; Tucker, Edelen, Ellickson, & Klein, 2011).

In relation to peer-group social norms, whether the behavior of close friends aligns with prevailing social norms or not could alter the impact of the social norm on individual behavior. More specifically, according to theories on normative consistency, friend behavior that is consistent with a norm amplifies youngsters' exposure to the behavior and associated values. In contrast, youth who affiliate with friends whose behavior differs from the wider peer-group norm offers a more diversified range of behavioural "guides" from which to choose when making behavioural decisions (Harding, 2007). This study explores whether affiliation with substance-using friends may play a role in influencing youth substance use by enhancing the effects of perceiving pro-substance norms. As such, it is hypothesized that friend substance use will play an amplifying role on adolescents' susceptibility to the influence of social norms among those who have friends who engage in substance use.

At the same time, parents continue to play a pivotal role in favoring youth outcomes by guiding them through the social experiences they experience outside of the home. (Henry, Tolan, & Gorman-Smith, 2001; Steinberg & Silverberg, 1986). This study focuses on a particularly influential aspect of the parent–child relationship: parental knowledge. While the notion of parental monitoring includes all parenting practices that involve tracking and surveillance of their child, parental knowledge is a more specific dimension of parental monitoring (Rote, Smetana, 2018; Stattin & Kerr, 2000; Dishion & McMahon, 1998). Parental knowledge is a multifaceted construct that refers to parents' awareness of their adolescents' lives. It has been consistently associated with lower or delayed substance use in adolescence in numerous cross-sectional and

longitudinal research (Clark, Shamblen, Ringwalt, & Hanley, 2012; Curtner-Smith & MacKinnon-Lewis, 1994; Flanagan, Auty & Farrington, 2019; Fosco, Stormshak & Dishion, 2012; Lac & Crano, 2009; Kapetanovic, Bohlin, Skoog & Gerdner, 2017; Martins, Storr, Alexandre, & Chilcoat, 2008). It is considered as an important protective factors against early substance use due to the fact that it facilitates adapted control of the child's behavior and because it reflects the quality of the parent-child relationship which is also considered as a protective factor to delayed or reduced usage in adolescence (Lac & Crano, 2009; Kapetanovic, Bohlin, Skoog & Gerdner, 2017).

Parental knowledge gained through open parent-child interactions offers parents opportunities to engage with their child and provide adapted rule-setting, encouragement and feedback (Stattin & Kerr, 2000). Ultimately, this gives rise to occasions for parents to gain insight into their child's views on their social context at school and potentially challenge exaggerated beliefs. For example, when a young adolescent complains that "everyone else" is allowed to drink alcoholic beverages, a parent may explain that, in fact, rules against underage drinking are actually normative for similarly aged kids. Through open and regular parent-child communication, youngsters are also exposed to a more diversified perspective of behavioral options on which to draw that may counter the influence of perceiving "risky" behaviors such as substance use as more common and therefore normative. In this manner, it is hypothesized that parental knowledge, through the communication and relational stability that it fosters, may contribute to attenuate the effect of pro-substance use norms at school on the likelihood that a teenager will use substances. Results of this study aim to provide a more comprehensive understanding of the underlying social processes that color the norm-behavior relationship and that should potentially be included as essential components to effective intervention and prevention efforts.

10.2 This Study

This study tests a model comprised of hypothetical paths in which parental knowledge and friend substance use are tested as cross-sectional and longitudinal moderators of the long-term association between perceived substance use norms and adolescents' substance use (see Figure 4.1). It we expect that youth who report a high perception of pro-substance use norms will be more likely to engage in substance use behaviors, both concurrently and over one year, as compared to youth who report a low perception of such norms. Second, we expect that high levels of friend substance use will augment the strength of the association between pro-substance use norms and adolescent substance use, Thirdly, we expect that high parental knowledge will attenuate the association between the pro-substance use norms and adolescents' substance use. It is expected that the hypothesized interactions will hold both cross-sectionally and longitudinally. As a last step, differences with regards to genders will be examined using multiple group analyses.

10.3 Method

10.3.1 Participants and procedure

Participants were 1,278 middle school students from eight middle schools located in a suburban area of the northwest region of the United States. Although information on family inconce was not collected, most participants were of middle-class families. Participants were assessed three times over the span of middle school: in Grade 6 (11 years old), Grade 7 (12 years old) and Grade 8 (13 years old). Because substance use is a behavior that begins to emerge in early adolescence, its prevalence among the participants at the first wave of data collection when they were on average 11 years old

was still extremely low, with only 5.1% reporting ever having ever used substances. At age 12 and age 13, prevalence of usage rose to 11.4% and 22.2% respectively. For this reason, our hypotheses will be tested on the last two time points, when participants were aged 12 (Time 1) and 13 years old (Time 2).

The proportion of targeted students who participated in the study was 74% and the retention rate from Grade 6 to 8 was 82%. The sample was composed of 45.5% boys and 54.6% girls. Participants were primarily of European decent (78.2%). Minority groups included Hispanic/Latino (4.5%), American Indian (3.3%), Asian American (3.1%), Pacific Islander (1.5%), African American (1.2%), mixed ethnicity (4.7%), and other or unknown ethnicity (3.6%). Most participants lived in two-parent families (70.8%); 13.9% lived in single-parent families, 13.1% lived in shared custody and 2.1% lived in other arrangements.

After gaining school principals' approval, consent forms providing the parents with information on the study was sent from the school to parents. Both parents and their child were required to sign and return the said form. Self-report questionnaires were administered in class by research assistants who also explained the study to the participating students. Teachers were asked to leave the classroom and participants were informed of the confidential nature of their data. Participants were paid 30$ for completing the survey at each wave of data collection.

10.3.2 Instruments

The Perception of Peer Group Norms Questionnaire (Marshall-Denton, Véronneau, & Dishion, 2016) is a 17-item measure that assesses middle school students' perceptions of positive and negative norms among their classmates. Participants are asked to rate

how many students in their class participate in different activities or behaviors on a 6-point Likert-type scale ranging from 0 (none) to 5 (almost all). Items refer to a range of behaviors both adaptive and problematic. For the purpose of this study, a new subscale comprised of three items was created to specifically assess students' perception of substance use behaviors among classmates. The following items included in Perception fo substance use scale: "[How many students] may have tried or use tobacco," "may have tried or drink alcohol" and "may have tried or use marijuana," with a reliability of $\alpha = .88$. A mean score with these items was created for the subscale.

The Student Substance Use Scale is a 2-item scale from the Student's Self-Report Survey (SSRS: Dishion & Stormshak, 2001). In the first question, participants are asked to report how many alcoholic beverages they have consumed in the past month (scale ranges from "no drinks" (0) to "41 or more drinks" (14)). Second, participants indicate how many cigarettes they have used in the past month (scale ranges from no cigarettes (0) to 8 cigarettes (8) and then jumps to from 1 pack (9) to more than 31 packs (24)). Because items are based on non-continuous scales and to ease interpretation, scores were standardized. A mean score of responses for both items was computed ($r = .39$).

The Parental Monitoring Knowledge Scale is also taken from the SSRS (Dishion & Stormshak, 2001). Youth reported on their perceptions of their parents' knowledge of their activities on a 4-item scale. Items asked participants how often one of their parents did at least one of the following behaviors in the last 3 months: know what the participant was doing when he/she was away from home; know where the participant was after school; have a pretty good idea about the participant's plans for the coming day; have a pretty good idea about the participant's interests, activities, and whereabouts. Participants answered on a 5-point scale ranging from 0 (never/almost never) to 4 (always/almost always). The mean score on all four items was computed with a reliability of $\alpha = .82$.

The Peer Nomination Instrument (Coie, Terry, Zakriski, & Lochman, 1995) is a social nomination questionnaire. Participants were provided with a roster of names of their grade mates who agreed to participate in the study. Participants indicated the names of their three best friends. By identifying participants' best friends, it is possible to use their friends' own self-reported data about their substance use (measure described above). More specifically, this study uses data based on reciprocal friendships: a friendship is considered reciprocal friend when a classmate named as a best friend also names the participant back. An average based on all nominated best friends was computed. In comparison to unilateral friendships, reciprocal friendship are likely to be closer and thus more influential to one another. It is for this reason that reciprocal friendships were chosen as an assessment of friendship over simple one-way peer nomination (Aloise-Young, Graham & Hansen, 1994). The full information maximum likelihood procedure was used to handle missing data and allowed for the inclusion in analyses of data from participants who had no reciprocated friendships (more on this below).

Analytic strategy

Preliminary analyses consist of examining missing value patterns, descriptive statistics and bivariate analyses. Primary analyses were performed through structural equation modeling using Mplus 8.0 (Muthén & Muthén, 2017). As adolescents' reports of substance use were notably different from being normally distributed, the analyses were conducted using maximum-likelihood estimationg with robust standard errors (MLR). MLR is robust to non-normality and non-independence of observations (Kline & Connell, 2004). This estimator also integrates the full information maximum likelihood (FIML) algorithm, which allows for the use of all available information from each participant, even for those with occasional missing data. This technique is regarded as an efficient way to analyze data from samples with moderate levels of missing data like ours, and is considered adequate for analyzing data that are not

missing completely at random, as long as the predictors are included in the model (Enders, 2010, Widaman, 2006). The model allowed for correlations between variables from the same measurement times.

Following Marsh, Hau and Wen's (2004) recommendation, model fit is evaluated using one incremental (Comparitative Fit Index; CFI) and one absolute fit index (Root Mean Square Error of Approximation; RMSEA) in addition to the χ^2 value and associated degrees of freedom. The CFI measure indicates how well the tested model fits in comparison to a baseline model and varies between 0 and 1. The RMSEA measures the amount of discrepancy between a model and the collected data. The model was deemed to have adequate fit if the CFI was > .95 and the RMSEAwas < .06 (Hu & Bentler, 1999). A non-significant chi-square value is also expected, although this index is highly sensitive to sample size and may be overly conservative when working with a large sample, which is the case in this study. For this reason, chi-square statistics are reported, but we give priority to other fit indices when evaluating model fit (Schermelleh-Engel, Moosbrugger, & Müller, 2003).

Gender differences were tested by multigroup comparisons for each path of interest. Model fit was compared between an unconstrained model in wich all regression coefficients were free to vary across genders and a constrained model in wich regression coefficients were constrained to be equal across genders. The significance of difference between nested models is established based on difference between CFI scores (Rensvoldt & Cheung, 2002).

10.4 Results

10.4.1 Preliminary analyses

Table 1 presents correlations among study variables. They were all significantly intercorrelated and in the predicted direction, with the exception of two non-significant correlations: between adolescent substance use at Time 1 and perception of substance use norms at Time 2 and between friend substance use at Time 1 and adolescent substance use at Time 2.

Missing data. Different levels of completion were reached for different measures. Students' absence from school for the data collection affected the completion of measures. Across the variables included in the study, the mean percentage of missing data, excluding friend-reported substance use variables, was 17.28% (range = 16.4%–19.4%). Higher levels of missing data appear for variables pertaining to friend reported substance use (T1 = 43.9%, T2 = 39.4%). This is likely due to the fact that the measurement of friends' characteristics is based on reciprocal friendships. This strict method of friendship identification, while allowing for a more valid assessment of true friendship than simple one-way peer nominations, may lead to missing data issues due to the fact that certain participants may only nominate friends who do not nominate them back. Measures of friend behavior were also limited by absent of consent to participate in the study from friends' parents for certain participants.

Little's Missing Completely at Random test showed that missingness for the study variables differed from the the requirements for data that are missing completely at random (MCAR), $\chi^2(243) = 302.23$, $p = .006$, The patterns of missingness were explored by computing correlations between participants' total number of missing values and their scores on other measured variables. Missing data were more common among participants who reported low levels of parental knowledge ($r = –.10$, $p < .05$) and high levels of substance use ($r = .14$, $p < .05$) at Time 2, and also for those whose friends reported high levels of substance use at both times of measurement (T1: $r = .13$, $p < .05$ and T2: $r = .14$, $p < .05$). The Full Information Maximum likelihood (FIML) procedure, used to estimate missing values, is regarded as one of the best practices for

handling missing values when data are not MCAR (Schafer & Graham, 2002). Covariance coverage ranged from 35% to 86%.

Descriptive Statistics. Table 4.1 presents the number of participants with valid data for each variable, along with their mean, standard deviation, and normality indicators. Most variables are normally distributed as indicated by both adequate skew (< 2.0) and kurtosis (< 8.0) levels defined by Kline (2011). However, variables that pertain to substance use were not normally distributed according to the recommended cutoffs. This phenomenon emerges in numerous other studies on adolescent substance use and reflects the natural prevalence of use at this age. (Davis et al. 2019; Liddle, Dakof, Turner, Henderson & Greenbaum, 2008). This issue is handled by using the maximum likelihood estimation with robust standard errors (MLR) Mplus which corrects for non-normal data. MLR is a more conservative method relative to traditional maximum likelihood estimation (ML), but we preferred this method because of its robustness to non-normality. Previous studies have demonstrated that MLR is effective in handling non-normality in data presenting with skew and kurtosis levels that exceed those in this study, indicating its appropriateness for use in this study (Yuan & Bentler, 2005; Savalei & Bentler, 2010).

Gender Differences. Gender differences for each variable were examined through a series of one-way ANOVAs. Boys reported significantly higher levels of substance use at both times of measurement and affiliated with best friends who reported higher substance use at Time 1. Boys also differed from girls because they reported lower levels of parental knowledge at both times. Girls reported higher levels of perceived substance use norms at Time 2 (all Fs >.20, ps < .05).

Substance use. At Time 1 (age 13), 23.4 % of participants reported having used cigarettes and/or tobacco at least once in the past month. At Time 2 (age 14) 33.2 % of participants reported use in the previous month. When breaking down cigarette and

alcohol use rates separately, 4.3% of participants reported cigarette use at Time 1 and 8% at Time 2. Meanwhile, 22.3% of participants at Time 1 reported alcohol consumption with 31.5% reporting alcohol consumption at Time 2.

10.4.2 Primary analyses

The hypothesized model provided an excellent fit to the data, χ^2 (10) = 26.24, p = .003, CFI = .97, RMSEA = .04. Even though the chi-square value is significant, other indices meet our criteria. Standardized coefficients for regression paths are presented in Figure 4.2. Correlations between variables measured at the same time were also included in the model, but not presented in Figure 4.2 for parsimony. These correlations were significant and in the predicted direction, ranging from r = .10 to .23, with p-values ranging from .00 to .02, with the exception of the correlation between friend substance use and perceived substance use norms at Time 2, which was non-significant. Non-significant interactions were removed from analyses to ensure more accurate interpretation of the corresponding direct effects on dependent variables. Fit of the new model was maintained (χ^2 (12) = 23.73, p = .003, CFI = .97, RMSEA = .04)

Gender invariance tests were conducted to determine whether differences in model fit were evident, which would suggest moderation effects based on gender. Tests for group differences in model fit revealed a significant difference between the constrained and the unconstrained models (CFI constrained = 0.95, CFI Δ = .02). Based on modification indices, we found that the constraints imposed on the link between parental knowledge at Time 1 and substance use at Time 2 had to be released. The fit of this partially constrained model does not significantly differ from the unconstrained baseline model, (CFI Δ = .005). This indicates that gender differences exist for this path, but not for the remaining regression paths. Specifically, a negative significant longitudinal association

between parental knowledge at Time 1 and substance use at Time 2 emerged for boys only (Boys: $\beta = -.11$, $p < .05$ and Girls: $\beta = .01$, $p = .71$).

Within each measurement time and also across the one-year interval, parental knowledge is a direct negative predictor of young adolescent substance use (T1: $\beta = -.17$, $p < .001$ and T2: $\beta = -.14$, $p < .001$). As a moderating variable, regression results show that parental knowledge was a significant moderator of the concurrent associations between substance use norms and substance use behaviors at both times of assessment (T1: $\beta = -.16$, $p < .01$ and T2: $\beta = -.10$, $p < .01$). Effect sizes were small and ranged from 0.06 to 0.21. Simple slopes were calculated by identifying three groups of substance use norm perception levels among participants: high perception of substance use norms (participants scoring at least one standard deviation above the mean), medium perception of substance use norms (participants scoring within one standard deviation below or above the mean) and low perception of substance use norms (participants scoring at least one standard deviation below the mean). Consistent with our hypothesis, simple slopes analyses reveal that, at both time points, parental knowledge attenuated the predictive effect of perceived norms on substance use (see Figure 4.3). Contrary to our hypothesis, this moderation effect did not hold for the longitudinal part of our model. Thus, it appears that the protective role played by parental knowledge is immediate and is not prolonged across one year unless it is actively maintained over time. Last, contrary to hypotheses, within both times of assessment and over one year, friend substance use did not predict adolescent substance use nor did it play a moderating role in the relation between perceived norms and substance use.

10.5 Discussion

This study investigates the social circumstances under which perceived peer group norms operate to influence young adolescent substance use outcomes. The cross-sectional and longitudinal associations between perceived substance use norms and two key proximal social factors (parental knowledge and friend substance use) were evaluated. Primary hypotheses were that (1) parental knowledge would act as a protective factor, tempering the known positive association between perceived pro-substance social norms and substance use, (2) friend engagement in substance use would exacerbate the said association of perceived norms on behavior, and (3) these moderating effects would emerge not only cross-sectionally, but also over a one-year period.

Our hypotheses regarding the moderating role of parental knowledge were mostly corroborated. Results show that parental knowledge mitigates the influence of perceived pro-substance use norms on substance use at both age 12 and 13. In other words, youth who reported that their parents were more informed of their behavior and activities were less vulnerable to the influence of substance use norms. Meanwhile, lower parental knowledge was associated with a greater influence of perceived norms on behavior. In fact, the influence of perceived social norms was the strongest in the presence of low parental knowledge. These findings are consistent with previous work highlighting the interactive and protective effects of parental knowledge on youth delinquency, binge drinking and deviant peer selection (Fosco, Stormshak, Dishion, & Winter, 2012, Fairlie, Wood, Laird, 2012). According to past studies, active parental involvement and interest seem to be especially crucial for mitigating deleterious outcomes for at-risk youth, such as for those growing up in unsafe neighborhoods, for youth high in sensation seeking and for those who affiliate with deviant peers (King, Fite, Poquiz, 2018; Rioux, Castellanos-Ryan, Parent, Vitaro, Séguin, 2019; Tian et al. 2019). Correspondingly, our findings suggest that parental knowledge also seems to be

helpful in the case of youth whose perception of social norms puts them at increased risk for substance use.

The buffering effect of parental knowledge that emerged in cross-sectional analyses at both time points were not maintained in the longitudinal portion of our model. This suggests that the protective role parents play in attenuating normative influence is temporal in nature. Thus, parents should maintain sustained involvement and interest in their child's activities as they grow older to ensure continued opportunities for checking in, gaining information and potentially correcting misperceptions. Such results are also compatible with studies that encourage parental involvement that is both continuous throughout adolescence and that is flexibly adapted to children's changing developmental needs. In fact, among different types of parental monitoring, Eccles et al. (1993) identified parental knowledge as having the strongest protective effect for young adolescents, as opposed to more involved approaches that work better for younger children, or more autonomy supporting and egalitarian styles for older teens (De Goede, 2009).

Unexpectedly, friend substance use had no direct association with youth substance use nor did it affect the positive association between substance use norms and behavior at either age or over time. These findings differ from past research that points to friend use as a major, if not the main, factor of influence in substance use initiation in youth (Eisenberg, Tombourou, Catalano, Hemphill, 2014). Our results also diverge from work by Maxwell (2002), which suggests that friend use is an amplifying moderator of perceived social norms since pro-substance use norms on their own may not be sufficient to lead to consumption without the presence of close friends with whom to consume.

Interpretations of this divergence may relate to differences in how friend behavior is measured in this study. It is likely that measures based on youth report of friend

behavior yield results of friend influence that appear stronger due to youth overestimation of friend's behavior (Poulin, Dishion and Hauss, 1999). Use of friend-reported data, as in this study, offers a more objective and likely conservative assessment of actual friend behavior, and of its potential influence on adolescent behavior.

Also, this divergence in results may be in part explained by the specific context of early adolescence during which levels of substance use are still generally low. It is likely that, at an age when substance use is just emerging and when friend use is still relatively low, as it is in our sample, competing social factors other than friend influence may exert more influence on behavior. In fact, a study by Salvy, Pederson, Miles & Tucker (2014) found that in early adolescence, wider peer group social norms were more influential than more proximal social determinants, such as spending time with friends who consume, which become more influential through middle adolescence and beyond as friendships and group identity consolidate. In fact, although friendships become more intimate, stable and, ultimately, influential throughout adolescence, these are in emergence in early adolescence. During this period, looking to the wider peer group as a means to fit in and for information on which to base behavioral choices is typical and adaptive (Rubin, Coplan, Chen, Bowker, McDonald, 2011).

Results did not support the hypothesis that the moderating role of parents on normative influence would emerge in a one-year longitudinal model. Interpretation of this result may be considered in relation to the Theory of Social Normative Behavior, which suggests that descriptive social norms exert influence mainly in the specific setting in which a behavior is observed, discussed, and perpetuated (i.e., when it is most salient) (Rimal, 2008). In early adolescence, as norms surrounding substance use are just beginning to emerge and take root, they are likely to evolve rapidly. When assessed at two time points one year apart, two distinct snapshots of a set of moving processes are revealed. So many transformations may happen within the individual and in their social

setting that mutual influences could be lost over one year. Hence, more frequent points of measurement may be needed to effectively capture the dynamic changes in these interactions at this age.

When it comes to gender differences, boys and girls differed in terms of the longitudinal role played by parental knowledge in predicting reduced substance use for boys and the absence of this association for girls. Although boys appear to benefit from long-term effects of parental knowledge in terms of decreased substance use one year later, results highlight that sustained parental attention and involvement is especially important for girls for whom parental knowledge did not appear to predict long-term benefits. Previous research supports the notion that adolescent girls both receive and are more susceptible to the protective effects of parental knowledge than boys (Keijsers & Poulin, 2013; Rubin, Coplan, Chen, Bowker, McDonald, 2011). Socialization processes that teach girls to value family relationships likely contribute to their increased propensity for open disclosure which subsequently promotes both increased parental engagement in monitoring practices and girls' increased susceptibility to the presence or absence of such practices (Kelly, Toumbourou, O'Flaherty, 2010).

That being said, overall, results pointed to significant similarities in the ways the interactive processes between parental knowledge and susceptibility to normative influence play out in boys and girls. Although boys demonstrated higher levels of substance use at both 12 and 13 years old, the protective role played by parental knowledge in mitigating the risks associated with perception of pro-substance use social norms emerged across both genders. Hence, it appears that although boys and girls tend to present with different baseline levels of consumption, they also show similar susceptibility to normative influence (Zucker et al, 2008).

10.5.1 Strengths, limitations and future research

This study has several strengths. Its large sample size provided sufficient statistical power to assess longitudinal interactions and make comparisons across genders. The longitudinal data also allowed for control for baseline measures and rigourous assessment of change in substance use at a critical developmental age when emergence of substance use behaviors implies significant risk for long-term behavioral and social consequences. Use of friends' own reported data for friend substance use is an improvement over self-report measures on perception of friend use.

Nevertheless, there are some weaknesses to this study that should be considered for future research. First, missing data issues were noted due to the longitudinal design and to the method we chose to measure friends' substance use based on reciprocal friendships only. This limitation should however be considered in the context of the rigor of the measure, which ensures that only established and reciprocal friendships were considered. Of note, missing data were more common among adolescents who reported a higher risk profile and non-random missing values may limit the generalizability of our results. That being said, missing data issues were handled using FIML in Mplus which is recommended over other missing-data strategies (Enders, 2010; Widaman, 2006). A note of caution should also be made when interpreting cross-sectional results, it impossible to consider the directionality of the associations. Due to lack of significant longitudinal results obtained, it is difficult to conclude whether norm perception leads to increased substance use or if norm perception is in fact the product of one's own behavior reflecting a "false consensus effect" (Ross, Greene, & House, 1977). Future longitudinal studies would benefit from including data points closer in time to more effectively assess the dynamic and quickly changing processes involved in substance use at this age.

Also, our assessment of parental monitoring presents a few shortcomings in that a measure that includes both parents' own reports about their knowledge combined with their child's report would offer a more complete reflection of this dyadic and reciprocal

process. Also the measure used in this study does tap into the specific mechanisms through which parents may gain information (Kerr & Statin, 2000). Moreover, our assessment of substance use was based on youth report of alcohol and cigarette consumption, thus limiting the generalizability of our results to other substances such as marijuana. Exploration of the social normative processes underlying the emergence of marijuana use would shed valuable light on the social circumstances relating to a substance undergoing significant social and legal shifts and with regard to which long-term attitudes and behaviors take root in adolescence.

In addition, the measure used to assess substance use behaviors examines youths' substance use in the previous month limiting our capacity to effectively examine youngsters' lifetime experiences and explorations with alcohol and tobacco. Considering that at this young age it is unlikely that many participants engage in substance use on a monthly basis, this measure may underestimate respondants substance use experiences and, hence, may not optimally yield a clear picture of early substance use behaviors. Future studies would benefit from use of a lifetime substance use measure that more optimally captures substance use initiation and risk.

Finally, due to that fact that our sample was drawn from a community that was predominantly middle-class and of European decent, it is impossible to determine whether these results generalize to other socio-economic contexts and ethnicities.

10.5.2 Theoretical and practical applications

This study extends existing research by exploring the underlying and interactive processes involved in normative influence on substance use in early adolescence. Building on the Theory of Social Normative Behavior, parental knowledge was identified as a key moderator of the magnitude of influence of peer norms on substance

use outcomes. Injunctive norms, identification with the reference group and self-identity have been previously identified as moderators of the influence of descriptive norms on behavior (Rimal, 2008; Lapinski, 2005). As perceived norms around substance use are likely to be unclear or just emerging in early adolescence, our study identifies a key opportunity for parents to engage with their children and offset the risks associated with perceived pro-substance use norms.

On a practical level, results of this study may inform programs that address misperception of social norms to decrease youth substance use and postpone age of initiation. More specifically, results of this study suggest that normative feedback programs, which aim to modify behavior by correcting norm misperception, would be optimized by including components that specifically target parents. For example, educating parents on the relevance of their child's normative beliefs and on accurate social norms could help parents gain insight into their child's world-view to, ultimately, intervene and correct normative misperceptions. Correspondingly, existing family-based prevention programs would benefit from adding components that also aim specifically to correct adolescents inflated perceptions about substance use norms.

10.6 Conclusion

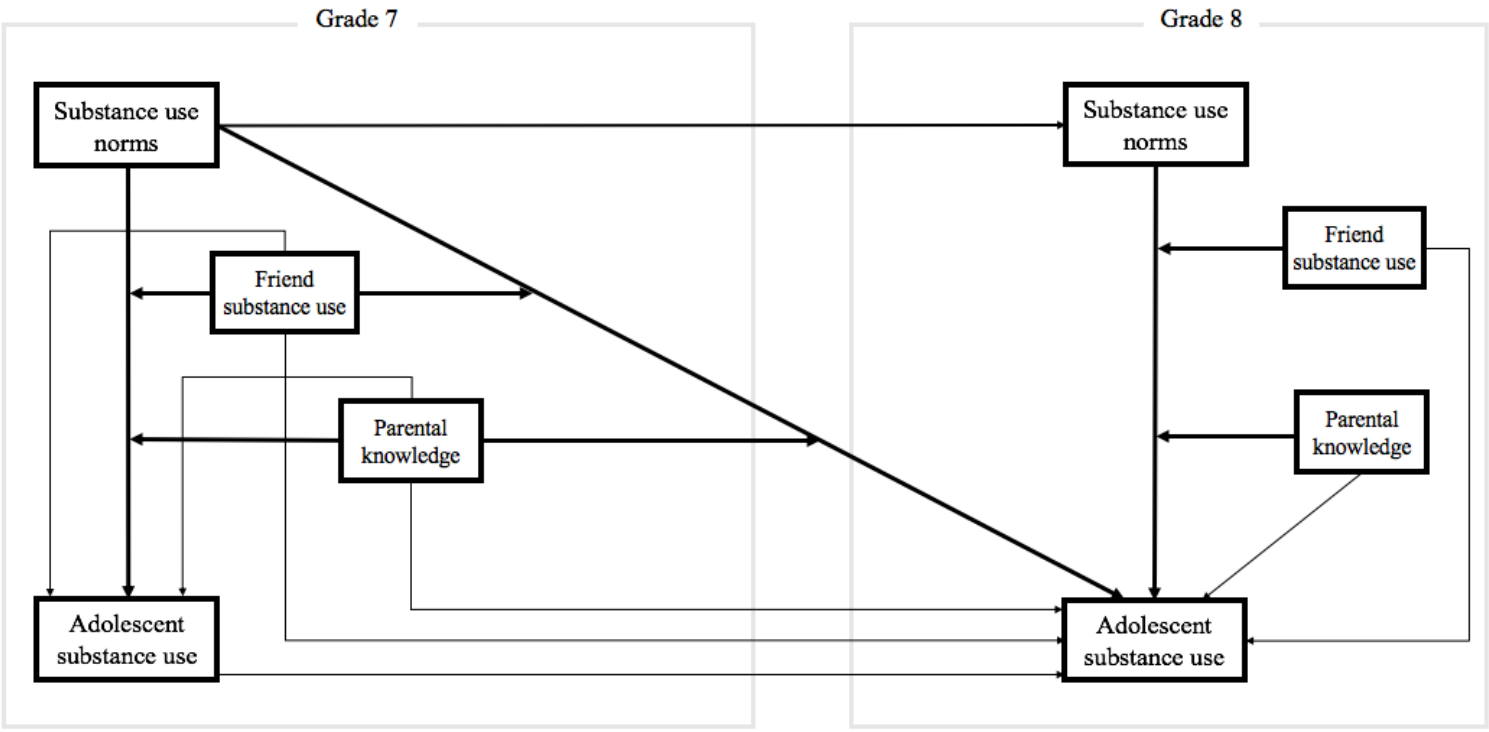
This study contributes to research on social norms by investigating the interactive processes underlying normative influence in the context of young adolescent substance use. Results corroborate the importance that perceived social norms play in predicting future substance use, and they provide evidence to the protective role parental knowledge plays in mitigating youth susceptibility to substance use norms. Findings also attest to the importance parents play, relative to close friend behavior, in impacting substance use outcomes at this age. Overall, findings point to the necessity of considering normative influence in youth in regards to both the targeted behavior and the developmental age under study, and to look beyond main effects to uncover sources

of social influences that could be promoted if they are found to be protective, or tempered if they amplify negative outcomes.

Table 4.1 Correlations between variables and descriptive statistics

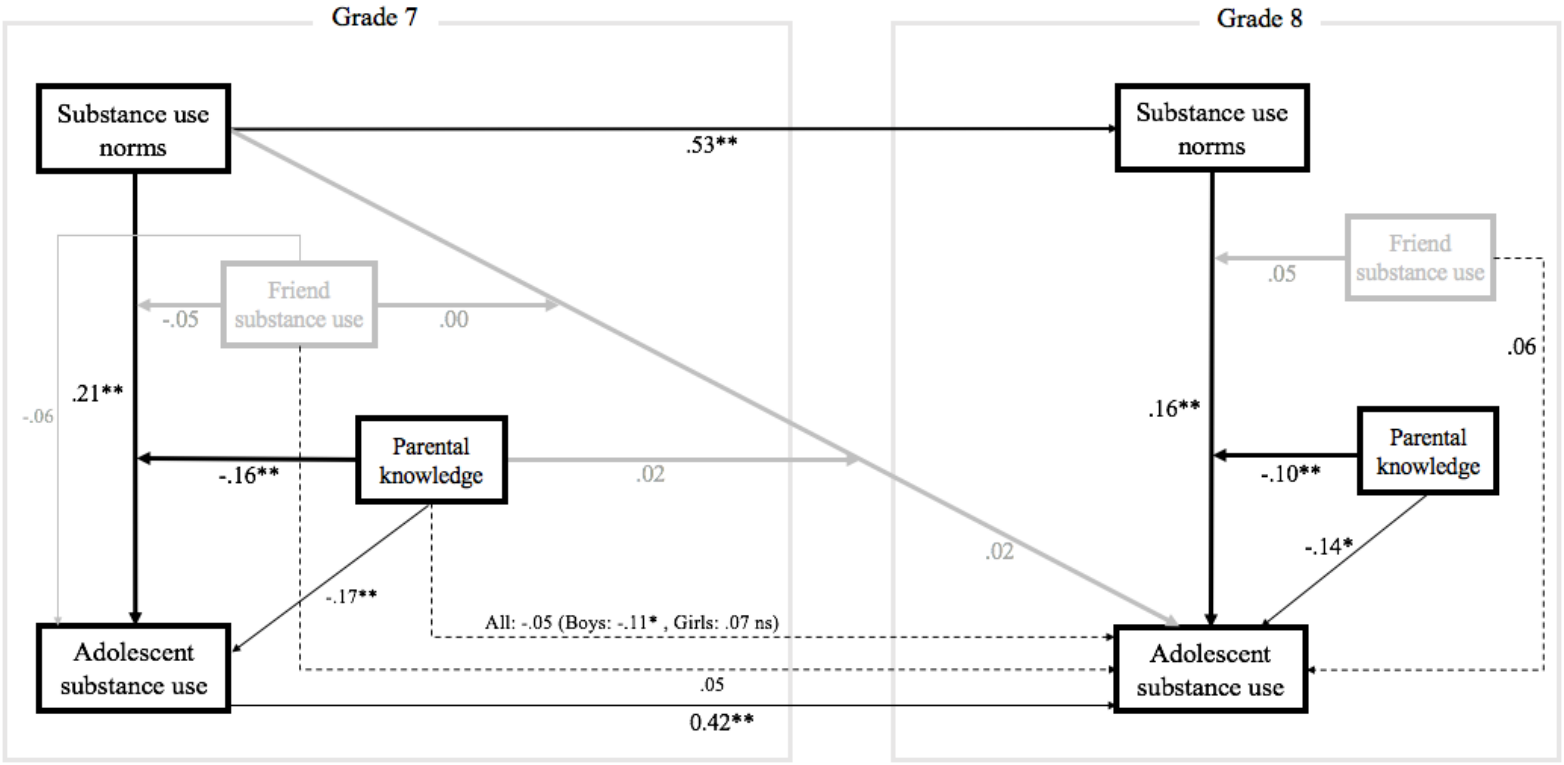
Variables	1	2	3	4	5	6	7	8
1. Substance use (T1)	–							
2. Friends' substance use (T1)	.10*	–						
3. Parental knowledge (T1)	-.18**	-.23**	–					
4. Perception of substance use norms (T1)	.20**	.20**	-.20**	–				
5. Substance use (T2)	.28**	.05	-.31**	.28**	–			
6. Friends' substance use (T2)	.14**	.13**	-.13**	.05*	.15**	–		
7. Parental knowledge (T2)	-.09*	-.10**	.57**	-.17**	-.36**	-.11**	–	
8. Perception of substance use norms (T2)	.02	.10*	-.12**	.54**	.34**	.06*	-.26**	–
N	1278	597	1057	1057	1068	774	1068	1063
Mean	.01	.11	3.46	2.04	.03	.12	3.34	2.74
Standard Deviation	.85	.23	.72	1.08	.85	.28	.72	1.22
Skewness	10.21	2.71	-1.83	.73	3.80	3.24	-1.55	.32
Kurtosis	66.82	8.04	3.36	.56	16.80	12.33	2.26	-.12

Notes: ** Correlation is significant at the 0.01 level, * Correlation is significant at the 0.05 level



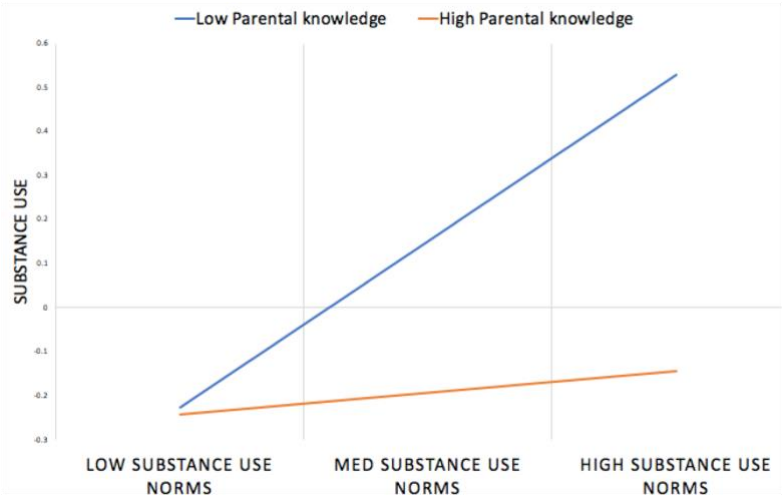
Notes: Correlations between variables measured at the same time were included in model but are not presented in Figure for parsimony.

Figure 4.1 Hypothetical model testing the moderating effects of parental knowleddge and friend behavior on social normative influence and substance use

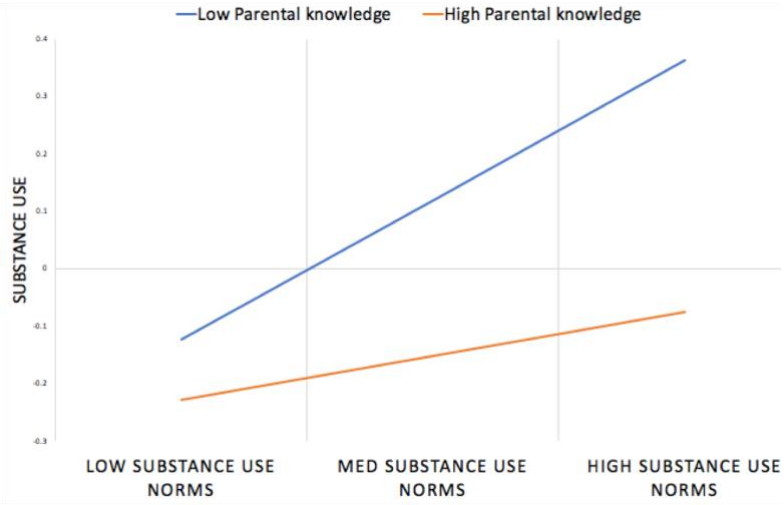


Notes: Correlations between variables measured at the same time were included in model, but are not presented in figure for parsimony. Non-significant paths are presented in gray and marginally significant paths are presented with dotted lines. Non-significant paths were included in model except for non-significant interactions which were removed for interpretation of significant direct effects. Indices of model fit: χ^2 (10) = 26.24, p = .003, CFI = .97, RMSEA = .04. ** p < .001, * p < .05

Figure 4.2 Results of model testing the moderating effects of parental knowleddge and friend behavior on social normative influence and substance use



Moderating role of parental knowledge in Grade 7



Moderating role of parental knowledge in Grade 8

Figure 4.3 Simple slopes results for two-way interaction between parental knowledge and perceived norms on substance use

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CHAPTER V

THE MODERATING EFFECTS OF PARENTAL KNOWLEDGE AND FRIEND BEHAVIOR ON THE ASSOCIATION BETWEEN SOCIAL NORMS AND YOUNG ADOLESCENT SCHOOL ENGAGEMENT

As a complement to Article 2, this chapter presents analyses and results pertaining to the assessment of the moderating role of parental knowledge and friend behavior on normative influence as it relates to school engagement outcomes, as planned in the dissertation project. Its contents were omitted from Article 2 in interest of parsimony. More specifically, in the context of the upcoming submission of Article 2 for publication, we chose to focus results specifically on substance use in an effort to facilitate choice of journal and to present a more focused article for readers. Results nevertheless offer novel insights into the process of normative influence in early adolescence and deserve attention. To avoid redundancy with Article 2, this chapter briefly outlines the rationale and findings that directly pertains to the study of school engagement. Readers may refer to Article 2 (Chapter IV) for a full description of the study method. The findings presented in this chapter will be discussed in the general discussion.

12.1 Study objectives

In comparison to the model tested for substance use in Study 2, which included two longitudinal data points, the current hypothetical model includes data from all three time points included in this sample. This is because school engagement, in contrast with substance use, is a relatively common behavior among early adolescents at all three time points versus substance use which emerged more significantly for older participants (Grade 7 and 8). The current model is comprised of hypothetical paths in which parental knowledge and friend school engagement are assessed as cross-sectional and longitudinal moderators of the association between the perception of school engagement norms and young adolescents' school engagement (see Figure 5.1). We first expected that youth who report a high perception of pro-engagement norms will be more likely to be actively engaged in school, both concurrently and over one year. Second, we expect that high levels of friend school engagement will augment the strength of the association between pro-school engagement norms and adolescent school engagement. Third, we expect that high parental knowledge will also augment the association between the pro-school engagement norms and adolescents' active engagement in school. It is expected that the hypothesized interactions will hold both cross-sectionally and longitudinally. To observe change over time, the model controls for baseline school engagement levels in the previous year, for the longitudinal parts of the model. The model also accounts for initial school engagement levels to test for the impact of perceived norms beyond the influence of one's own behavior. As a last step, differences with regards to gender will be examined using multiple group analyses.

12.2 Methods

12.2.1 Instruments

The Perception of Peer Group Norms Questionnaire (Marshall-Denton, Véronneau, & Dishion, 2016) was used to measure our independent variable. The details pertaining to this scale's items are presented in Chapter II. For the present study, we used the perception of school engagement norms subscale as used in Study 1 (Chapter II).

12.3 Results

12.3.1 Preliminary analyses

Missing data. Across the variables included in the study, the mean percentage of missing data, excluding friend-reported school engagement, was 17.82% (range = 15.8%–20.3%). Variables pertaining to friend-reported school engagement displayed higher levels of missing data (T1 = 47.5%, T2 = 41.2%, T3 = 37.2%) due to the fact that the measurement of friends' characteristics is based on reciprocal friendships. As indicated by a significant Little's Missing Completely at Random test, $\chi^2(395) = 516.39$, $p < .001$, the pattern of missing values was not completely random. We explored the patterns of missingness by calculating the number of variables with missing values for each participant. Next, we computed correlations between participants' total number of missing values and their scores on other measured variables. Missing data were more common among participants who reported low levels of school engagement at all three times of measurement (T1: $r = -.10$ $p < .05$, T2: $r = -.15$, $p < .05$, T3: $r = -.12$, $p < .05$), for those with friends reporting low levels of school engagement at Times 2 and 3 (T2: $r = -.10$, $p < .05$, T3: $r = -.10$, $p < .05$) and also for those who reported low levels of parental knowledge at Times 1 and 2 (T1: $r = -.10$, $p < .05$, T2: $r = -.12$, $p < .05$). Covariance coverage ranged from 45% to 84%.

Descriptive Statistics and Correlations. Correlations between all variables are presented in Table 5.1 This table also presents the number of participants with valid data for each variable, along with their mean, standard deviation, and normality indicators. Tests of normality show that all variables are normally distributed as indicated by both adequate skew (< 2.0) and kurtosis (< 8.0) levels as defined by Kline (2011). Bivariate correlations are significant and are in the predicted direction, with the exception of the correlations between friend school engagement at Time 1 with perception of school engagement norms at Time 2 and at Time 3, which was non-significant.

Gender Differences. A series of one-way ANOVAs were used to examine gender differences. Girls reported significantly higher levels of school engagement, parental knowledge, and had friends who also reported higher levels of school engagement at all three times of measurement than boys duid (all *F*s > 13.43, *p*s < .00).

12.3.2 Primary analyses

The hypothesized model provided an adequate fit to the data, χ^2 (40) = 91.71, p <.000, CFI = .97, RMSEA = .03. Even though the chi-square value is significant, other indices meet our criteria. Standardized coefficients for regression paths are presented in Figure 5.1. With the exception of non-significant interaction paths, all non-significant paths were included in analyses but omitted from Figure 4.2 for parsimony. Non-significant interactions were specifically removed from analyses to ensure more accurate interpretation of the corresponding direct effects on dependent variables. Fit of the final model was maintained (χ^2 (90) = 283.98, p <.000, CFI = .89, RMSEA = .04). Correlations between variables measured at the same time were also included in the model, but not presented in Figure 5.2 for parsimony. These correlations were

significant and in the predicted direction, ranging from r = .06 to .48, with p-values ranging from <.001 to .02.

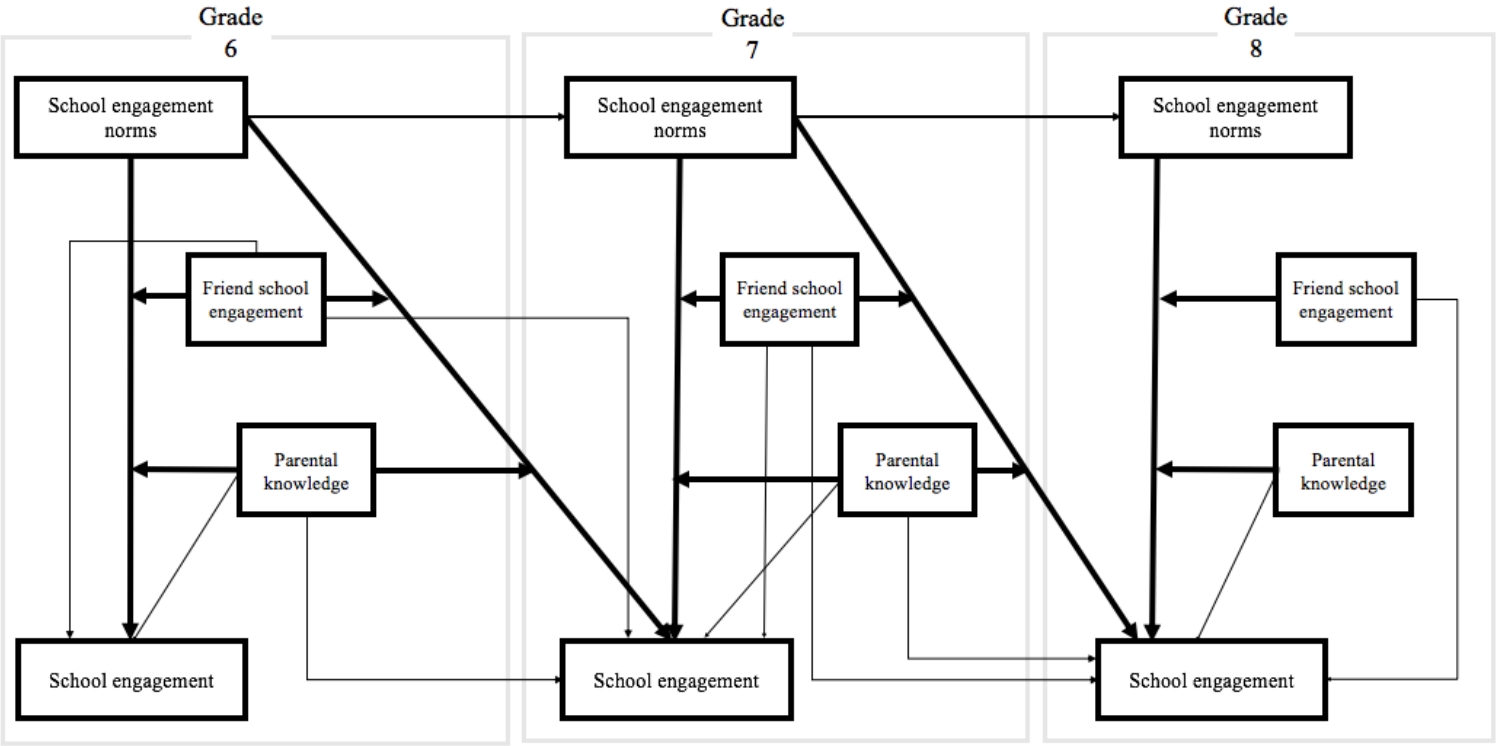
Within each measurement time, parental knowledge positively predicted adolescent school engagement (T1: β = .26, p < .001, T2: β = .24, p < .001 and T3: β = .23, p < .001). Also, parental knowledge was only a significant moderator of associations between perceived school engagement norms and school engagement behaviors at Time 1 (β = .05, p < .05). Consistent with our hypothesis, simple slope analyses reveal that parental knowledge enhanced the effects of perceived norms on school engagement (See Figure 5.3). However, neither direct effects nor moderation effects held for the longitudinal part of our model. Thus, it appears that the positive role played by parental knowledge is immediate and is not prolonged over time unless it is actively maintained. Gender invariance tests were conducted to determine whether there were moderation effects based on gender. We found no significant differences between the constrained and the unconstrained models (CFI Δ < .001), indicating that model results are generalizable to boys and girls.

Friend school engagement positively predicted school engagement at the three measurement times (T1: β = .15, p < .001, T2: β = .10, p < .01 and T3: β = .15, p < .001). It also longitudinally predicted increased school engagement between Time 1 and Time 2 (β = .04, p < .01) but did not predict change in school engagement between Time 2 and Time 3. Contrary to hypotheses, friend school engagement did not play a moderating role in the relation between perceived norms and school engagement within each time of assessment and over time. Perception of student engagement norms did not predict school engagement over time.

Table 5.1 Correlations and descriptive statistics

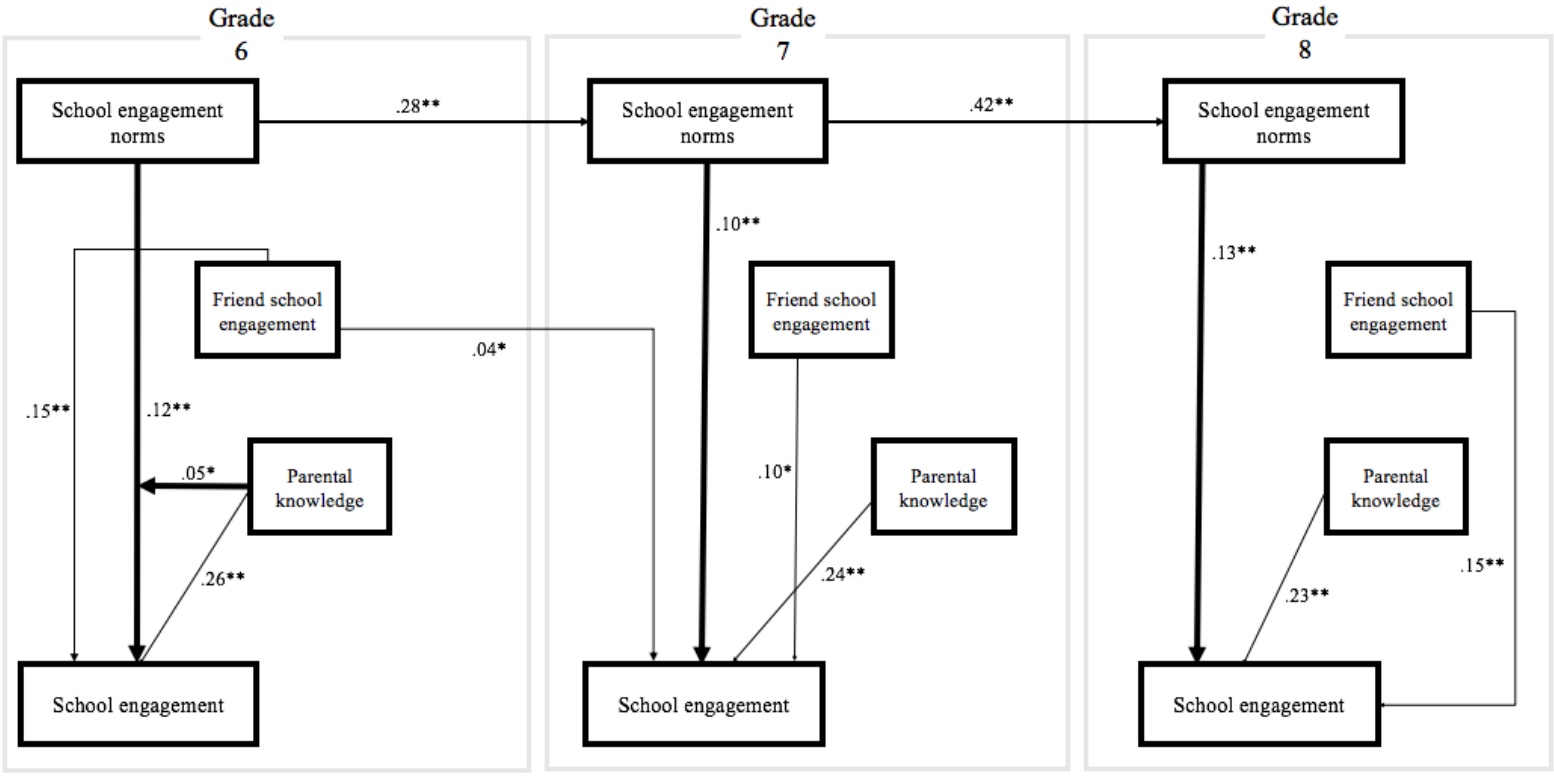
Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. School engagement (T1)	–											
2. Friends' SE (T1)	.31**	–										
3. Parental knowledge (T1)	.48**	.18**	–									
4. SE norms (T1)	.34**	.13**	.31**	–								
5. School engagement (T2)	.55**	.26**	.32**	.27**	–							
6. Friend SE (T2)	.27**	.38**	.24**	.11**	.31**	–						
7. Parental knowledge (T2)	.32**	.16**	.48**	.27**	.50**	.23**	–					
8. SE norms (T2)	.22**	.05	.25**	.32**	.30**	.16**	.26**	–				
9. School engagement (T3)	.45**	.17**	.30**	.23**	.62**	.25**	.41**	.22**	–			
10. Friends SE (T3)	.25**	.15**	.21**	.12**	.27**	.38**	.19**	.12**	.41**	–		
11. Parental knowledge (T3)	.29**	.16**	.41**	.20**	.38**	.22**	.57**	.19**	.53**	.28**	–	
12. SE Norms (T3)	.23**	.08	.19**	.24**	.23**	.14**	.20**	.45**	.37**	.19**	.27**	–
N	1278	671	1030	1018	1069	751	1057	1050	1076	802	1068	1053
Mean	3.40	3.49	3.54	4.49	3.23	3.25	3.46	4.01	3.13	3.18	3.35	3.87
Standard Deviation	.61	.49	.70	.92	.68	.61	.72	1.05	.74	.62	.78	1.01
Skewness	-1.62	-1.70	-2.32	-.76	-1.30	-1.28	-1.83	-.48	-1.18	-1.14	-1.55	-.37
Kurtosis	3.21	4.25	6.03	.65	1.66	1.82	3.36	.08	1.37	1.61	2.26	-.09

Notes: SE is school engagement and SU is substance use. **. Correlation is significant at the 0.01 level, *. Correlation is significant at the 0.05 level; ns is non-significant.



Notes: Correlations between variables measured at the same time were included in model but are not presented in Figure for parsimony.

Figure 5.1 Hypothetical model testing the moderating effects of parental knowleddge and friend behavior on social normative influence and school engagement



Notes: Correlations between variables measured at the same time were included in model, but are not presented in figure for parsimony. Non-significant paths are omitted from figure but were also included in analyses with the exception of non-significant interactions which were removed for interpretation of significant direct effects. Indices of model fit: χ^2 (10) = 26.24, p = .003, CFI = .97, RMSEA = .04. ** $p < .001$, * $p < .05$

Figure 5.2 Results of model testing the moderating effects of parental knowleddge and friend behavior on social normative influence and school engagement

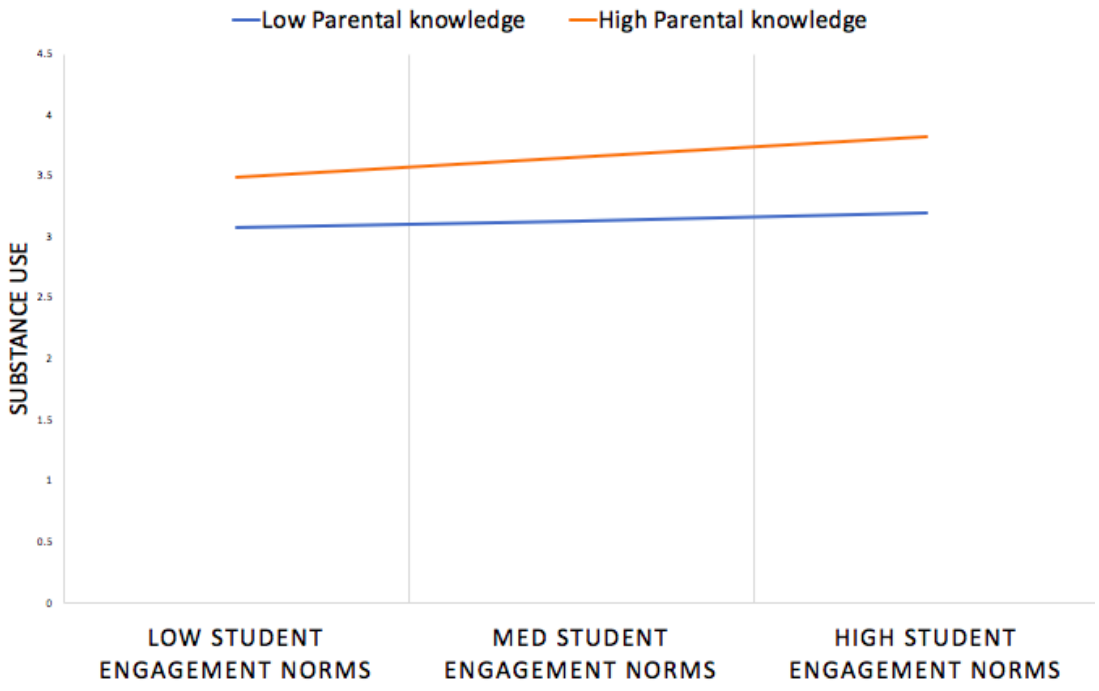


Figure 5.3 Simple slopes results for two-way interaction between parental knowledge and perceived norms on substance use in Grade 6

CHAPTER VI

GENERAL DISCUSSION

12.4 Summary of findings

In two studies, this dissertation examined the role different elements of the early adolescent social context play in affecting youth psychosocial adjustment as operationalized by school engagement and substance use. Using a mediation model, Study 1 examined the underlying role perception of peer-group social norms play in the association between friend and family influences and youth adjustment. In a moderation model, Study 2 examined how the family and friendship contexts may amplify or attenuate the known relation between perception of peer-group social norms and youth behavior. A brief overview of the main findings follows.

In our first study, norm perception was evaluated as a mediation pathway through which parental knowledge and friend behavior exert influence on youth outcomes. Perceived social norms significantly mediate the association between parental knowledge and enhanced youth school engagement over time, indicating that a pathway through which parents may positively affect their children's adaptive behavior

at school is through their influence on how youth subjectively perceive their peers' behavior at school. Perceived substance use norms significantly mediated the relation between friend use and future youth use, over time, suggesting that perceived social norms are also a mechanism through which friend influence is exerted.

In our second study, parental knowledge and friend behavior were evaluated as moderators of the known positive association between perceiving higher levels of substance use social norms and youth substance use. Findings show that parental knowledge mitigates the influence of perceiving high substance use norms on substance use behaviors cross-sectionally for 12- and 13-year-olds. In accompanying analyses, findings show that parental knowledge also interacts cross-sectionally with perceived school engagement norms by enhancing the effect of the perceived norm on youth school engagement for younger adolescents only (11 years old). Friend behavior neither enhanced nor weakened the relationship between perceived norms and behavior.

Together, these findings contribute to our current understanding of the social ecology that surrounds and contributes to youth school engagement and substance use. Findings also contribute to the advancement of knowledge on the role perceived peer-group social norms play in informing youth behavior. Because norm perception is an inherently subjective process that places the perceiver at its center, interpretation of findings pertaining to the role played by perceived social norms will be considered within the broader social-developmental context of early adolescence.

12.5 School engagement and substance use in early adolescence

Early adolescence is a time of transition. Being actively engaged at school is not only a key predictor of school success but also sets youth on a path associated with improved

mental health and higher educational attainment (Archambault & Janosz, 2009; Branden, 2006; Li & Lerner, 2011; Wang & Fredricks, 2014; Wang & Peck, 2013). Although the benefits of school engagement in early adolescence have been widely demonstrated, it remains that children show a drop in school engagement levels as they grow into early adolescence (Dotterer, Lowe, & McHale, 2014; Marks, 2000). Findings from our first study are consistent with this tendency as our project participants' school engagement levels decreased significantly between age 11 and 13. Concurrently, although average reported substance use levels remained low throughout the 3 yearly measurements of our study, findings show a significant increase in reported substance use levels over each year. This corresponds with literature that positions early adolescence as a key period in which initiation of substance use behaviors first begins for some; a behavior that puts youth at risk for escalation in use over time and for the developmental of a range of future academic and social difficulties (Bauman & Phongsavan, 1999; Behrendt, Wittchen, Höfler, Lieb, & Beesdo, 2009; Toumbourou et al., 2007).

12.6 The influence of perceived peer-group social norms in early adolescence

The accuracy of individuals' perceptions of what behaviors are most prevalent among their peers is limited by their own subjectivity and biases. Nonetheless, perceptions are important and influential. As put by Perkins and Wechsler (1996), "people act on their perceptions of their world in addition to acting within a real world" (p. 962). Research on adolescents' estimates of their peers' alcohol use suggests that youth tend to misperceive the behaviors of their broader peer group. In fact, Helms et al. (2014) concluded that adolescents tend to dramatically underestimate their peers' engagement in adaptive behaviors while also overestimating their participation in risky or rule-breaking behaviors. The risks associated with norm misperception are important in consideration that susceptibility to peer influence peaks in early adolescence (Steinberg & Silverberg, 1986; Lafonta et al. 2010). As a matter of fact, our results suggest that

perceived social norms play a significant and enduring role in affecting youth school engagement and substance use.

More specifically, Study 1 showed that both school engagement and perception of pro-school engagement norms decrease through early adolescence. That being said, those who perceive higher school engagement levels among their peers show higher school engagement behaviors the following year than their peers who perceive low school engagement as being the norm, even after controlling for their initial levels of individual school engagement, close friend school engagement and parental knowledge. Our findings parallelly show that perception of substance use among peers increases through early adolescence. Moreover, an increased propensity to perceive that substance use is more common among peers is predictive of increased individual use over time. This points to the unique role youth's subjective appraisal of social norms plays in contributing to their choices to be actively engaged in their studies and to potentially begin exploring in substance use behaviors.

To date, research on social normative influence has largely focused on older populations such as high school-aged and college-aged students (Perkins, 2003). Our findings support the notion that young adolescents are also susceptible to the influence of perceived social norms. Although this is consistent with a breadth of research that purports early adolescence to be a period of heightened susceptibility to peer influence, this project, in a novel way, places perceived social norms as a mechanism through which social influence is exerted. Moreover, by considering normative influence in terms of not only risky behavior but also in relation to adaptive behaviors, our results highlight how susceptibility to peer group norms may have positive outcomes in promoting positive and desirable youth behaviors.

12.7 Early adolescent social context and perceived peer-group social norms

Early adolescents' outcomes can be understood as embedded within numerous social relationships and contexts. Considering that the peer-group represents a powerful socializing context in early adolescence, the influence of perceived peer-group social norms was examined as a central component to this dissertation. Friend behavior and parental knowledge have been empirically identified as key influents in young adolescents' lives and both have been associated with youth adaptive and maladaptive outcomes in numerous ways. That being said, previous studies have largely examined their effects separately or, when considered together, as independent contributors to youth outcomes (Masten, Juvonen & Spatzier, 2009). This dissertation draws on Brofenbrenner's social-ecological model to integrate both parents and friends into our consideration of normative influence on school engagement and substance use in early adolescence. We proposed that social norm perception functions as a mediating mechanism that explains how friend behavior and parental knowledge can affect youth outcomes (study 1) and that friend behavior and parental knowledge also moderate youth susceptibility to the influence of perceived norms (Study 2)

12.8 The influence of parental knowledge

Current findings support the notion that parents continue to play a critical role in early adolescence in a number of ways. Firstly, our results show a direct longitudinal association between parental knowledge and youth psychosocial adjustment in terms of predicting increased school engagement and decreased substance use over time. This is coherent with a host of research that purports that despite the growing importance of friends in early adolescence, parents continue to crucially affect youth outcomes in positive ways (Flanagan, Auty & Farrington, 2019; Clark, Shamblen, Ringwalt, & Hanley, 2012). Further, this finding also informs current research on the relational

needs of the developing child in early adolescence. Research shows that adolescents' perspectives on their parents' authority change and parenting behaviors that were beneficial for younger children may have somewhat deleterious effects in adolescence (Pomerantz & Eaton, 2000). That being said, according to Pomerantz and colleagues (2000), early adolescence is a developmental period during which high levels of parental knowledge seeking behaviors, even if perceived by some as intrusive, may still be considered by youth as signs of parental interest and as desirable involvement. Along these lines, work by Smetana and colleagues (1988) suggests that while young adolescents may grow to view parental involvement in personal domains (such as imposing bed-time) as more intrusive, they continue to value involvement in domains that pertain to morals and conventions (such as telling the truth). According to work by Pomerantz and Eaton (2000), older children develop the understanding that their parents' knowledge seeking behaviors may be motivated by positive intentions meanwhile, for older adolescents, involvement may be viewed as controlling or as undermining to one's sense of competence and autonomy. Considering our results, it thus remains important for parents to demonstrate continued interest and curiosity towards their children's life and wellbeing by encouraging open sharing of information even in early adolescence as youth begin to push back against parental involvement.

Such results are also compatible, from a bio-ecological perspective, with studies that encourage parental involvement that is not only continuous throughout adolescence, but that is also flexibly adapted to children's changing developmental needs (Eccles et al. 1993; De Goede, 2009). In fact, Bronfenbrenner's model emphasized the proximal and reciprocal processes that underly the parent–child relationship over time (Jaegar, 2016). As the central actor in this process, the early adolescent's disposition and developmental needs for autonomy and individuation influence his or her parents' shift from parenting practices focused on supervision, monitoring and control to behaviors focused on communication and knowledge seeking. In demonstrating responsiveness to their young adolescent's developmental needs for increased independence, parents

also play a role in promoting it and in subsequently instilling enhanced open-communication and mutual trust within the parent-child relationship.

Secondly, findings partially support the hypothesis that perceived social norms play an explanatory role in the relation between parental knowledge and youth outcomes. Previous research characterizes parental knowledge as a heuristic measure that not only reflects a wide range of parent–child behaviors but that also may be considered as a proxy measure for the quality of the parent–child relationship (Rote, Smetana, 2018; Stattin & Kerr, 2000). Eliciting open communication not only contributes to building up knowledge abut their child's life, but it likely also fosters enhanced opportunities to convey their values and expectations to their child. Beyond, parental knowledge contributes to a warm and trusting relationship in which youth may feel more prone to adhering to household rules in efforts to maintain quality of the relationship (Stattin & Kerr, 2000). Our findings show that youth who apparently benefit from a high-quality parent-child relationship, as reflected in high levels of child-reported parental knowledge, are more likely to perceive that their peers are engaged in their studies. This subsequently predicts increases in their own school engagement over time. Our results point to the idea that parental knowledge, through enhanced communication, trust and relationship quality, may offer a context in which parents can affect their child's developing perspective of his or her school environment. Such findings suggest that youth's subjective perception of social norms represents a pathway through which parental knowledge exerts influence to promote positive youth outcomes.

Contrary to hypotheses, parental knowledge does not seem to be predictive of youth's appraisals of their peers' substance use behaviors. This may potentially be explained by the fact that, at this young age, substance use is not discussed at home and that friends, rather, represent the source of information on which youth base assumptions about wider group tendencies. On the other hand, parents who engage in monitoring practices with their young adolescents tend to observe, seek and exchange information

about their child's school progress, attitudes towards school and homework completion, offering a context in which he or she can develop ideas about what is normative for kids his or her age. Discussions with parents about substance use may become more common in adolescence as substance use behaviors become more prevalent (Olds & Thombs, 2001). Future studies would benefit from the inclusion of variables that specifically assess topics of conversation that occur with parents and that explore longitudinal change throughout adolescence

Third, findings show that parental knowledge also functions as a protective factor against early adolescents' susceptibility to perceived social norms. Specifically, results show that when participants were younger, parental knowledge enhanced the influence of perceived pro-school engagement norms. Eleven-year-olds who displayed the highest levels of school engagement were those who perceived high levels of pro-school engagement norms and whose parents were most knowledgeable of their behaviors. In other words, the combined influence of having "knowledgeable parents" with perceiving that school engagement is "normal" among classmates appreas to contribute to an amplified susceptibility to the influence of perceived norm on behavior. This enhancing effect was not maintained at age 12 and 13, nor did it emerge longitudinally, over two time points. This suggests that the protective role parents play in promoting positive normative influence may be developmentally specific to younger adolescents.

In terms of protective effects in relation to substance use, results show that parental knowledge mitigates the influence of perceived pro-substance use norms on substance use at both age 12 and 13. In other words, youth who reported that their parents were more informed of their behavior and activities were less vulnerable to the influence of substance use norms. Meanwhile, a lack of parental knowledge was associated with showing a greater susceptibility to the influence of the perceived norms on behavior. In fact, according to interpretation of simple slope analyses, the susceptibility to

perceived norms was strongest in the presence of low parental knowledge. These findings are consistent with previous work highlighting protective effects of parental knowledge on youth delinquency, binge drinking and deviant peer selection (Fosco, Stormshak, Dishion, & Winter, 2012, Fairlie, Wood, Laird, 2012). According to past studies, active parental involvement and interest seem to be especially crucial for mitigating deleterious outcomes for at-risk youth, such as for those growing up in unsafe neighborhoods, for youth high in sensation seeking and for those who affiliate with deviant peers (King, Fite, & Poquiz, 2018; Rioux, Castellanos-Ryan, Parent, Vitaro, & Séguin, 2019; Tian et al. 2019). Correspondingly, our findings suggest that parental knowledge also seems to be helpful in the case of youth whose perception of social norms puts them at increased risk for substance use.

Combined, these findings highlight the continued importance parents plays in early adolescence. Longitudinally, parental knowledge predicts increased school engagement and decreased substance use. Through the openness and trust instilled by parents' knowledge seeking behaviors, parents may also affect their child's perception of peer group norms—an underlying mechanism through which parents foster more positive youth outcomes. That being said, according to our findings, the buffering role parental knowledge plays in mitigating the known risk associated with perceiving that maladaptive behaviors are normative among peers is cross-sectional and not longitudinal. This may be explained by our study design in which yearly assessments may not effectively capture the longitudinal process of change. In the context of the bio-ecological model, early adolescence represents an age when youth and their environment undergo multiple and rapid developmental and social changes. It is possible that more closely timed assessment points would more effectively reveal the mutual processes embeded in the chronosystem. As such, the ongoing and enduring role parents play in mitigating the changing risks associated with norm perception may emerge more clearly. That being said, lack of longitudinal findings does suggest that parents should maintain sustained involvement and interest in their child's activities as

they grow older to ensure continued opportunities for checking in, gaining information and potentially affecting their child's perception of peer norms.

12.9 The influence of friend behavior

In early adolescence, friendships become more complex, intimate and influential (Brown & Larson, 2009). Current findings point to the role perception of substance use norms plays as an underling mechanism of friend influence. Current findings highlight that friend behavior affects youth's corresponding perception of school engagement and substance use norms in different ways. Said discrepancies point to inherent differences between school engagement and substance use as behaviors that take place in different settings and hold different meanings at this age. For instance, studies show that early adolescents tend to minimize their achievement efforts when interacting with their peers (Juvonen & Murdock, 1995). Hence, beyond being a less observable behavior, school engagement is downplayed socially, representing a behavior that youth may engage in individually and at home, but that is not necessarily advertised through outwardly visible behaviors or in group discussions. On the other hand, exploration in substance use in early adolescence tends to be a social activity that takes place in group settings. The peer group thus represents a key setting in which observations of and conversations about substance use begin to take place (Monahan, Rhew, Hawkins, & Brown, 2014; Tucker et al., 2012). Considering that friend school engagement may be difficult to detect, one's estimation of its prevalence among the wider peer group may need to be based on other information.

The fact that the "observability" of a behavior may affect the extent to which youth perceive it as more or less prevalent is coherent with work by Cislaghi and Heise (2018) who proposed that "detectability" of a behavior affects the extent to which its associated norm influences behavior. According to our results, detectability may also in fact shape one's actual perception of that norm to begin with. In the context of this

project, it appears that detectability of a behavior speaks to the sources on which early adolescents rely on to inform their subjective normative impressions. For instance, perception of substance use norms was informed by friend substance use, a potentially more detectable behavior amongst peers. Meanwhile, perception of school engagement norms, was informed by open communication with parents which had no direct association with perception of substance use norms.

These findings point to the differential roles parents and friends play as social influents in early adolescence. Authors have previously suggested that although parents likely play a significant role in shaping a wide range of youth behavior, friends more specifically exert influence on behaviors that are risky, as found in our study with friend influence on perceived substance use norms and absence of friend influence on perceived school engagement norms (Masten, Juvonen, & Spatzier, 2009).

Moreover, the fact that parenting practices and friend behavior inform perceived norms in different ways for school engagement and substance use is also coherent with social norm research that suggests that descriptive social norms likely operate differently from one targeted behavior to the other (Chung & Rimal, 2016). School engagement and substance use are two negatively correlated behaviors that differ in terms of the contexts in which they take place and in regards to the implications of changing interpersonal relations and roles occurring at this age.

12.10 Social norms – a dynamic construct

According to the TSNB, the more one perceives that a behavior is prevalent among peers, the more it is considered as normative and the more likely one will engage in said behavior. That being said, the strength of this relationship is not necessarily linear (Real & Rimal, 2003). Drawing on TSNB, this project considered friends and parents

as possible factors that play a role in enhancing or attenuating the influence of norms on behavior.

The theory of social normative behavior postulates that injunctive norms, outcome expectations and group identity are meaningful moderators to the effect of norms on behavior. Recently, the list of meaningful moderators has been broadened to include characteristics such as group-involvement, ego-involvement, self-efficacy, individual attitudes and perceived social proximity to the reference group. Perceived social proximity and outcome expectations are especially relevant to our discussion of the role played by parental knowledge as a moderator of both school engagement and substance use norms in early adolescence. The closer an individual perceives him or herself to belong to the group, the stronger influence of the perceived group norm on his or her behavior. This is relevant to our current findings in consideration of the known trade-off that occurs between the relative importance played by parents and friends in early adolescence. In line with the literature that identifies parental knowledge as a cornerstone to the quality of parent-child relationships, it is possible that youngsters whose parents are more knowledgeable about their lives also benefit from more open communication and a higher quality parent-child relationship. Resulting relational proximity may protect against the "risky" social norms perceived amongst their peer group. Thus, although early adolescence represents a period in which susceptibility to peer influence peaks, it may also represent a pivotal period in which parents protect against susceptibility to problematic social influences via enhanced knowledge, communication and sense of proximity.

If parental knowledge contributes to perceived social proximity to parents, it is also probable that it affects youth's assessment of outcome expectations relative to school engagement and substance use norms. Outcome expectations refer to one's belief that a behavior will lead to positive or negative outcomes. Outcome expectations both exert direct influence on behavioral choices and also promote or hinder strength of effect of

descriptive norms on behavior. Parental involvement may provide youth with context on which to base their assessment of possible outcomes to expect for their school engagement or substance use related activities. Through the more frequent and higher quality parent-child communication associated with parental knowledge, youngsters may assess benefits related to putting effort into school and to staying away from drugs and alcohol.

It is also possible that, in a way, parent's implication towards their child sets an injunctive norm communicating an expectation and value that children, who benefit from the warmth and closeness associated with parental knowledge, are motivated to adhere to maintaining the high quality of their relationship with their parent. In this perceptive, our findings are coherent with the Focus Theory of Normative Conduct according to which social norms do not exert the same degree of influence in all contexts or for all people (Cialdini et al., 2006). The theory more specifically suggests that norms motivate behavior when they are rendered salient to the perceiver and norms are most salient when injunctive and descriptive norms are aligned. According to our results, which highlight the role parents play in affecting the extent to which their children are influenced by norm perception, it is possible that parents render school engagement norms more salient and substance use norms less salient through knowledge seeking behaviors that communicate household values and expectations (injunctive norms).

Importantly, our findings also highlight the temporal nature of social normative influence. If we consider the changes that occur in early adolescence, including development of new friendships and emergence of autonomy seeking behaviors, it is likely that early adolescents' attitudes, preferences and beliefs undergo fluctuation. This points to the importance of continued and sustained parental involvement and interest in their child's activities as they grow older to ensure continued opportunities

for checking in, gaining information and potentially correcting normative misperceptions.

This project focuses on adolescents' perception of their peer group's normative behaviors at school. That being said, findings indicate that parents likely remain a parallel reference group with whom youth maintain closeness and attachment affecting the extent to which perceived norms are impactful in shaping their behavioral outcomes. As follows from these results and in parallel to previous work calling for consideration of the moderators of social normative influence, social norms intervention programs must go beyond efforts to modify how young ones perceive the social norms of their group and consider the interacting elements that contribute to susceptibility to normative influence.

12.11 Practical implications and interventions

How can we harness the power of social norms in young adolescence to promote desirable behavior change? Our findings offer support for the utility of prevention programs that include social marketing approaches to behavior modification, that is, programs that aim to alter individuals' perceptions of peer group norms to reduce incidence of risk-taking behavior (Borsari & Carey, 2003; Morrongiello, Lajunen & Rasanen, 2004, McArthur, Kane, & Fleury, 2013; Perkins et al., 1999; Stok, Ridder, Vet, & Wit, 2014). The aim of such programs is to modify behavior by correcting individuals' erroneous perceptions of social norms. Our findings inform these ongoing prevention endeavors because they highlight the importance of considering the broader social-ecological context in which social norms take form and with which social norms interact to exert influence on youth behavior. After all, social normative influence does not function in a vacuum separated from the social context in which social norms operate. Young adolescents consider outcomes, evaluate costs, assess acceptability,

make comparisons with others and as indicated by our results, are affected by their parents' involvement in ways that alter their susceptibility to a given social norm.

While social marketing programs have been widely implemented in American colleges to curb binge-drinking behaviors, results of this study speak to the potential of exploring the efficacy of similar strategies to target substance use in early adolescence, a developmental period during which exploration in use commences and assumptions about normative use begin to form. Our results also demonstrate the potential for using perception of social norms as a mechanism of change to promote positive behaviors such as engagement in school, in particular when considering that valuing of school effort may be publicly minimized and communicated as being "uncool," thus potentially influencing some middle school students to perceive school engagement norms as lower than they are in reality (Galván, Spatzier, & Juvonen, 2011). Social marketing campaigns that advertise that school effort and active participation in school is actually normative, if that is the case, may serve to correct erroneous perceptions and potentially bring youth to adjust their own behavior accordingly. The National Social Norms Center is an online resource that recommends best practice guidelines for the development of effective and empirically based social norm marketing campaigns. It specifically presses the necessity for campaigns to communicate accurate statistics on the prevalence of a targeted behavior. In this context, campaigns aiming to promote school engagement should firstly assess the proportion of kids who do, for example, "do their homework", "set goals for success" and "exert academic effort". Obtained results would then be used to create visually compelling advertising campaigns that inform kids of the actual descriptive norm based on the prevalence of school engagement reported by their peers (For example: "Did you know that 86% of your peers do their homework every night?").

Our results also speak to current efforts within social norm research that aim to distinguish whether preventative efforts should communicate what is done (descriptive

norm) or what is expected by the group (injunctive norm). Experiments on the effectiveness of normative feedback interventions on changing behaviors in the contexts of public littering, curb side recycling, stealing from a national park and guest hotel towel use have demonstrated that messages framed in terms of injunctive or descriptive norms yield differing effectiveness. Whether it is most appropriate to communicate the prevalence of a behavior (descriptive norm) or the group acceptance of a behavior (injunctive norm) depends on the actual prevalence of the said behavior within the group. When the objective prevalence of an undesirable behavior is actually low, communicating an injunctive norm or a message that emphasises the "riskiness" of the said behavior may unintentionally convey that the behavior is more common than it is in reality. This was evident in previous prevention efforts on US campuses that used fear- and value-based strategies to target student binge-drinking. These resulted in the unintended inflation of students' perception of the prevalence of binge-drinking among their peers by conveying "this behavior is rampant and dangerous, everyone is doing it, others are doing it more than I am, therefore my own consumption levels must not be so bad and need not be reduced". This establishes a negative descriptive norm on which people may assess their behavior in unhelpful ways. Hence, when a behavior is *not* rampant, such as with substance use in early adolescence that we used in our studies, it is more useful to communicate the correct descriptive norm (Thompson, 2018).

On the other hand, when an undesired behavior is, in actuality, common and efforts are aimed at reducing its prevalence, communicating the high descriptive norm would not be helpful and may normalize it even further such as with binge-drinking in college-aged populations (Perkins, Craig & Perkins, 2011). Emphasis on an injunctive norm would be recommended in such cases. Although our results emphasized a decline in student engagement during early adolescence, most participants reported generally moderate or high levels of student engagement. Hence, as a desirable behavior that may be considered as objectively prevalent, programs that aim to increase school

engagement would benefit from communicating the actual descriptive norm rather than risk promoting the erroneous belief that most students are not engaged; a negative descriptive norm that may lead to maladaptive behavioral changes. Overall, these results highlight the relevance of developing programs that target descriptive norms specifically for young adolescents, an age group for whom undesirable behaviors are only beginning to emerge.

Beyond social marketing campaigns, the power of correcting erroneous perceptions through descriptive norms can also be harnessed within broader educational and skills-based prevention programs. The Atelier de prévention des toxicomanies, known as APTE ado, is a school-based interactive program initiated in Quebec that places a central focus on addressing youngsters' misperceptions about substance use. Based on the notions that erroneous beliefs about substance use may lead to increased engagement in substance use behaviors, interventions specifically encourage participants to discuss their beliefs in groups. During discussions, they are offered timely, targeted and accurate feedback to correct possible misperceptions as they arise (Vaugeois, Germain & Rêgo, 2008).

According to Chung and Rimal (2016), prevention or intervention programs should target modifiers that are amenable to change to identify effective strategy for norm modification programs. As a mechanism that may affect outcome expectations, perception of social proximity as well as norm salience, parental knowledge might be a relevant target to effectively shift youth's beliefs about and susceptibility to social norms. In fact, our findings suggest that promoting parental knowledge in families of young adolescents offers opportunities for parents to engage with their children to offset the risks associated with the influence of perceived "risky" social norms. Educating parents on the relevance of their child's normative beliefs and on accurate social norms could help parents gain insight into their child's world-view to, ultimately, intervene and offer nuance to problematic normative beliefs. Correspondingly, existing

family-based prevention programs (Dishion et al., 2008) might benefit from adding components that also aim specifically to target youth's perceptions about social norms. The benefit of considering the role played by parents and family is pressed by authors Vitaro, Carbonneau and Assad (2006) who emphasize the importance of multi-actor interventions that harness the power of risk, vulnerability and protective factors. Indeed, in a review of the effectiveness of substance use prevention programs in Quebec, the inclusion of multiple actors, including parents and/or friends, was identified as a predictor of long-term program success in comparison to efforts that focus solely on the adolescent or their parents (Laventure, Boisvert & Besnard, 2010).

As a protective factor identified in this project, parents may be included in normative intervention strategies directed at young adolescents as actors that have the potential to incur direct influence on youth's normative beliefs by helping their kids develop more accurate beliefs for example that substance use is not that common or that school engagement is actually quite common among peers their age. Beyond, enhanced parental knowledge behaviors also affect youth susceptibility to the influence of negative descriptive norms. Novely, a study by Jones et al. (2018) showed that adolescents' parents also show inflated perceptions of youth substance use rates. Considering our results that point to the role parents may play as vehicles for perception change, intervention strategies that target early adolescence would benefit from including parents. For example, Reality Check (Cambridge Public Health Department, 2015) is a prevention program that targets adolescent substance use by teaching parents how to engage in open dialogue with their young teens. Several of the targeted skills teach developmentally adaptive interventions for parents to become more knowledgeable of their child's life and substance use habits and also promotes parent-child discussion of child's normative perceptions, attitudes and behaviors to subsequently create enhanced opportunities in which to intervene and offer corrective information.

The Communities That Care Coalition (2016) also includes adolescents' parents as a component of their social norm intervention. Their objective is to target parents' own views of which parenting behaviors are normative in other families to target potential misperceptions about the commonality of reduced monitoring and involvement for young adolescents. These communicate such information as "98% of parents know who their teens are with when they are not home" and "95% of parents don't let their teens drink". In consideration of this project's current findings that identify parents as factors that contribute to normative influence, informing parents of the correct prevalence of substance use among early adolescence could be also be a helpful tool, among others, for parents to be able to effectively intervene with their children.

Importantly, studies on the effectiveness of prevention programs that call on parent participation highlight major barriers that impede on their successful integration causing low parent participation rates and high attrition levels. Such barriers include stigma and parental resistance associated with screenings and diagnostic methods. Barriers also include limited resources and lack of continued support from intervention staff and administrations to recruit and maintain parent participation overtime. Barriers related to family context in terms socio-economic environment also appear to limit participation from more "at-risk" families and those who may need it most (Forman, Hoagwood, Crowe & Saka, 2009). In order to increase accessibility of family-centered preventions, efforts have been made to develop programs available online. For example, the Family Check-Up program, a widely implemented and reviewed intervention for the prevention of early adolescent problem behavior, has developed a promising online program for parents that addresses many of the aforementioned barriers. Through increased accessibility, flexibility and anonymity, results show increased parent participation and retention rates. These point to the importance of web accessibility for optimizing parent participation (Danaher et al, 2018).

The aforementioned APTE ado program also includes a 60-minute online program for parents that aims to equip parents to act more effectively when it comes to parenting practices and speaking with their youngsters about substance use. Goals are to help improve parent-teen communication, quality of the relationship, parent discipline skills and conflict resolution strategies. Integration of a norm-based component in which parents are informed of both accurate substance use norms (ex: at 13 years old, X% of teenagers do not consume alcohol or drugs) and of accurate parental knowledge norms (ex: X% parents of 13-year-olds know who their kids are with after school) would be a simple addition that may help bonify the existing intervention.

Finally, findings also attest to the pertinence of targeting interventions towards behaviors that are positive and desirable. Youth susceptibility to social norms is often considered in terms of risk and viewed as something that youth should be protected against. However, in the context of positive behaviors such as student engagement, it may be beneficial to be swayed by an inflated perception of the norm. Family dynamics of open communication, trust and warmth, such as those typically associated with parental knowledge, can serve to amplify this effect, perhaps through parents' modelling of behaviours, values and attitudes that are consistent with youth's perceptions of what is going on at school. Moreover, considering our results that highlight social norms as a phenomenon that is likely in fluctuation in early adolescence, such intervention programs would benefit from repeated interventions over time to ensure lasting results.

12.12 Strengths and limitations

The articles presented in this dissertation present many strengths, but also some limitations that would be important to account for in future endeavors. First, the large

number of participants helped us identify even small effects. Moreover, a majority of norm-based studies use cross-sectional designs limiting ability to make inferences on the mechanisms through which norms affect behavior (Chung & Rimal, 2016). The longitudinal designs of our studies allowed assessment of change by statistically controlling for the baseline levels of students' substance use and school engagement. The three-wave statistical design in Study 1 also allowed for control of baseline mediator variables, a best practice in mediation analysis. This enabled us to assess change in outcome variables as explained by perception of peer norms over time. That being said, lack of significant longitudinal results obtained in Study 2 point to the importance, in future studies, to include data points closer in time to more effectively assess the dynamic and quickly changing processes involved in social normative influence at this age.

Due to the longitudinal design and to the method we chose to measure friends' behavior, missing data issues were noted in both studies. This limitation was however counterbalanced by the rigor of the measure for friends' behavior, which ensures that only established and reciprocal friendships were considered. Non-random missing values may limit the generalizability of our results; however, the use of FIML in Mplus to manage missing data minimized this risk, relative to the use of other popular missing-data management strategies such as list-wise deletion, mean substitution and single imputation (Enders, 2010; Widaman, 2006). Still, research shows that problematic and antisocial behavior in adolescence is associated with less stable friendships (Brown, 2004). Beyond missing data, it is hence also important to note that use of this strict method for friendship identification may limit our ability to obtain information on the friends of participants who present a higher risk profile (higher substance use, lower school engagement, lower parental knowledge).

Moreover, limiting assessment of friendships and peer-group social norms to the classroom context is also worth noting. The classroom has been identified as a

fundamental social system for peer influence (Shin, 2007) and, as demonstrated in this project, classroom social norms play a significant role in informing youth behavior in both adaptive and maladaptive ways. However, students who do not have friends in their class may look to friends outside of the classroom or in their neighbourhood when forming their perception of what is normative. As such, our use of the classroom as a specific reference group limits our ability to assess the influence of intimate friendships and broader peer-group norms that take place outside of the classroom. An avenue for future research would be to consider the role played by social norms in the broader peer context in and outside of school.

In terms of measures, parental knowledge was assessed using adolescent reports, which may not accurately reflect objective parental knowledge levels. However, as our main variable of interest pertained to adolescents' perceptions of social norms, adolescents' perceptions of their parents' behaviors are highly relevant and perhaps more so than objective measures. Moreover, youth-reported parental knowledge is considered by some as a more accurate assessment of the construct as parents tend to overestimate the extent to which they are aware of their child's life (Flanagan, Auty, Farrington, 2019; Statting & Kerr, 2000; Laird, Petit, Bates & Dodge, 2003). Also, our parental knowledge measure was used as a heuristic method to capture a set of multifaceted parent-child processes, but it does not shed light on the numerous ways through which parents gain access to information from their child. Obtaining information through coercion, control, solicitation or willing openness from the child likely reflect different types of parenting practices that may work differently in the moderating processes under study. Hence, future studies should include more specific measures of parental knowledge that tap into the underlying processes through which information is gained from children.

Also in regards to measures, substance use was assessed based on youth report of alcohol and cigarette consumption limiting the generalizability of our results to other

substances such as marijuana. This limitation is best considered in the context of the period in which the data for this project was collected. The database used in this project is from the larger *Next Generation Project*, a widescale longitudinal study that took place in the early 2000s. At this time, substance use trends in youth differed from those observed today. Notably, prevalence of alcohol and tobacco use in adolescence was significantly higher relative to prevalence of cannabis consumption (Golub & Johnson, 2001). In fact, according to *Monitoring the Future* (National Institute on Drug Abuse), an American national survey, a decline in juvenile marijuana usage was observed between 1995 and 2005 (Johnston, O'Malley, Miech, Bachman & Schulenberg, 2017). Today, the opposite can be observed in relation to a significant drop in youth tobacco usage and increase in marijuana consumption in terms of prevalence, frequency and quantity (Miech, Keyes & O'Malley, 2020; Peiper, Ridenour, Hochwalt & Coyne-Beasley, 2016). As laws and attitudes are changing, adolescents also now have access to more methods of consumption including vapping and increased ease of access. Exploration of the social normative processes underlying the emerge of marijuana use would shed valuable light on the social circumstances underlying a substance undergoing significant social and legal shifts and for which long-term attitudes and behaviors take root in young adolescence (D'amico & McCarthy, 2006; Kokkevi, Gabhainn, Spyropoulou, 2006; Rusby, Westling, Crowley & Light, 2018).

Another strength to this study is the inclusion of both friend and family variables, two pivotal social actors in young adolescents' lives. Hence, by considering the direct and indirect influence of friends, family, and young adolescents' personal interpretation of school social norms, this study takes a well-rounded view of the impact of youth's social environments. To date, research on normative influence in adolescence has largely focused on negative or risky behaviors (Beck & Treiman, 1996; Eisenberg, Neumark-Sztainer, Story, & Perry, 2005; Perkins, Craig, & Perkins, 2011; Unger et al., 2000). By considering school engagement, a positive school behavior, along with

substance use, this study enabled us to assess the positive ways in which youth are influenced by social norms.

CONCLUSION

This dissertation contributes to research on social norms by investigating the processes underlying normative influence in the context of young adolescent substance use and school engagement. In effort to inform effective prevention programs that mitigate risk in early adolescence, a large body of research has attended to the study of the social influents of "problematic" youth behaviors, with less attention paid to behaviors that are considered as "prosocial" or "desirable". Although the study of risky behaviors is of continued value for informing endeavors that are necessary to curbing youth delinquency, aggressive behavior, and substance use, studies that investigate the social contributors to healthy adjustment have the potential of offering a novel perspective on social influence at this age. This project considered school engagement and substance use as complementary markers of early adolescent psychosocial adjustment. This project also included the broader social ecology in which normative beliefs and influence take place by considering the role played by youth's primary socializing contexts, parents and friends, in affecting normative beliefs and outcomes. Findings emphasize parental knowledge as a key factor in affecting youth's beliefs about their peers' behaviors and also in protecting against endorsing risky normative beliefs.

ANNEXE A

ITEMS USED FOR EACH VARIABLE

Perception of School Engagement Norms *"How many students in your class …?"*	1. Set goals for school success 2. Complete homework 3. Treat teachers with respect 4. Treat other students with respect
Perception of Substance Use Norms *"How many students in your class …?"*	1. May have tried or use tobacco 2. May have tried or drink alcohol 3. May have trip or use marijuana
School Engagement *"How often do you …?"*	1. Complete my homework and assignments on time 2. Cooperate with teachers 3. Have positive feelings towards school 4. Get yourself up and ready for school on time 5. Complete school work independently 6. Skipped school without an excuse
Substance Use *« How many … have you consumed in the last month?*	1. How many cigarettes 2. How many drinks
Parental Knowledge "*How often does at least one of your parents …*?"	1. Know what you are doing when you are away from home? 2. Know where you are after school? 3. Have a pretty good idea about your plans for the coming day? 4. Have a pretty good idea about your interests, activities, and whereabouts?

ANNEXE B CONSENT FORM

THE NEXT GENERATION

CHILD AND FAMILY CENTER · UNIVERSITY OF OREGON

GENERAL CONSENT FORM · PROJECT PARTICIPATION

This is a consent form for my family to participate in The Next Generation project, under the direction of Drs. Thomas Dishion and Elizabeth Stormshak, at the University of Oregon. I have read the informational brochure on The Next Generation project, and understand the following:

- I willingly agree to participate in the project, knowing that any information gathered about me and my family that could be used to identify me or my family will be kept strictly confidential with the following exceptions: Staff members will report to appropriate authorities 1) physical injury to any child caused by other than accidental means, as required by ORS 419B.005 through 419B.040; and 2) information from a study participant which leads them to believe a person is in danger of imminent physical harm. In addition, staff may inform parents or guardians if their child is in serious physical danger.

- The Department of Health and Human Services (DHHS) has issued a Certificate of Confidentiality to The Next Generation project, which protects the investigators from being forced to release any research data in which my family or I am identified, even under a court order or subpoena. This protects me and my family from being identified in any civil, criminal, administrative, legislative, or other proceedings, whether federal, state, or local. This protection, however, is not absolute. For example, investigators will report child abuse as stated above to the appropriate authorities. Because this research is sponsored by the National Institute on Drug Abuse, staff from this or other DHHS agencies may review records that identify me and my family. However, it is the policy of these agencies and of the investigators that every attempt will be made to resist demands to release information that identifies my family and me. When results of this study are published, my name and the names of my family members will not be used. The Certificate of Confidentiality does not represent an endorsement of this research project by the Secretary of Health and Human Services.

- The information will be collected by The Next Generation project staff at the University of Oregon through in-person interviews, a videotaped family problem-solving task, questionnaires, a computer-based assessment of substance use, and weekly telephone interviews. I understand that I will be paid $40 after completing the assessment and an additional $40 following the feedback session. Data from police, school, and juvenile court records are also collected.

- The information I provide will be coded so that it is not connected with any individual's name. I understand that The Next Generation project staff and research associates will have access to this information for educational and scientific purposes only.

- Social security numbers will be used only for the purpose of contacting individuals in the future and that providing social security numbers is strictly voluntary.

- I have the right to withdraw from this project at any time and to require that personal information about my family be removed.

I have read and understand the information concerning The Next Generation project at the University of Oregon. I have received a copy of this consent, and I have had all my questions about the project and my family's participation answered to my satisfaction. If I have further questions, I understand that I may contact Research Coordinator Barbara Fries at (541) 346-3419. If I would feel more comfortable discussing my concerns about the project with someone outside the project staff, I am free to call University of Oregon Office of Human Subjects Compliance at 346-2510 (Riverfront Research, Park Suite 106, Eugene, OR 97403), which has agreed to act as an advocate for study participants.

I hereby agree to the participation of my child:

*First name:*_____ *MI:*_____ *Last name:*_____

*Date of birth:*__ __ / __ __ / __ __, *Social Security #* __ __ __ / __ __ / __ __ __ __, and me

in The Next Generation project at the University of Oregon.

Parent/Legal Guardian: _____ Date:_____
signature

_____
PRINT name

*Address:*_____
street *city* *state* *zip*

*Phone #: (_____)*_____

Child: _____
signature

Witness: _____ Date:_____
☐ Next Generation staff *signature*
☐ Other


https://cfc.uoregon.edu/atpe

ANNEXE C ETHICS APPROVAL

UQÀM
Université du Québec à Montréal

CIEREH
Comité institutionnel d'éthique de la recherche avec des êtres humains

No : S-709977

THE INSTITUTIONAL ETHICS COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS (IECRHS) has examined the following study progress report :

Principal investigator (PI): Dr. Marie-Hélène Véronneau
Department : Psychology
Research title: «*Mediators of the relationship between Peer Experiences and Academic Adjustment*»
Co-researcher: Thomas J. Dishion (Arizona State University)

Students in a Master or Ph.D program conducting in 2013-14 their research within the framework of the research project cited above:
Marie-Pier Dupré, Sophie-Caroline Trempe, Rhea Marshall-Denton (Fall 2013) and Marie-Claire Vaillancourt (Fall 2013).

This study progress report is found to be ethically acceptable in accordance with the terms of the human ethics policies of the University of Quebec at Montreal (2012), the Canadian Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (2010).

This research protocol is approved for the period **July 26, 2013 through July 26, 2014.**
The UQAM PI is responsible for submitting an annual or final status report: (http://www.recherche.uqam.ca/ethique/humains/comites-reunions-formulaires-eth-humains/cier-comite-institutionnel-dethique-de-la-recherche-avec-des-etres-humains.html).

If any study modifications occur prior to the next annual review, including study terminations, please notify the CIEREH promptly.

Initial certificate date: July 26, 2011
Certificat renewal date(s): R-1: July 26, 2012; R-2: July 26, 2013

Gilles Dupuis, PhD
Département de psychologie
Chairperson

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