Using General Strain Theory to Understand Drug and Alcohol Use in Canada: An Examination of how Strain, its Conditioning Variables and Gender are Interrelated

by

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ABSTRACT

This thesis uses the Canadian Drugs and Alcohol survey conducted in 1994 by Statistics Canada to explore how Agnew's (1992, 2001, 2006) general strain theory can help to understand drug and alcohol use in Canada. Agnew argues that experiences of strain, which include an array of negative life events, produce a negative emotional response which creates pressure for corrective action. In postulating why certain individuals are more likely to react to strain with deviant behaviour, Agnew (1992, 2001, 2006) emphasizes the importance of variables that condition the effects of strain on deviance. It is argued that people are less likely to respond to strain with deviant coping strategies depending upon their levels of social control, constraint, social support and deviant peers and values (Agnew 1992; Broidy and Agnew 1997; Agnew 2006).

Results are very supportive of GST as measures of objective and subjective strains as well measures of the conditioning variables are consistently associated with drug and alcohol use in hypothesized directions; strain measures also tended to interact with conditioning variables in associations with substance use. Hypotheses surrounding gender differences were also supported as females generally scored higher than males on measures argued to protect against the effects of strain and lower on measures argued to encourage deviant coping. Additionally, objective financial strain tended to have a stronger effect on male substance use while subjective strains tended to be more important in the prediction of female substance use. Avenues for further research are discussed including ways to ameliorate the adaptation of GST to gendered substance use patterns.

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I dedicate this thesis to my late father, Pierre Asselin.

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CHAPTER 1 - INTRODUCTION

Strain theory has changed and evolved significantly since its early beginnings in 1938 with Robert Merton and the classical tradition. According to Merton the motivation for criminal behaviour comes from a disjunction between "socially prescribed aspirations and socially structured avenues for realizing these aspirations" (Merton 1968:188). Achieving monetary success and the American Dream are goals that are particularly important to the perspective. Failure to achieve these goals results in frustration and produces a sense of anomie or normlessness, whereby individuals who do not have the conventional means to achieve their goals reinvent their goals or innovate new criminal means to achieve them (Merton 1968). Merton specifies a typology of adaptations to strain that includes conformity, innovation, ritualism, retreatism and rebellion (Merton 1968). Each adaptation is defined by an actor having different combinations of means and goals. For example, the innovator aspires to the goals prescribed by conventional society but does not have the means to achieve them through conventional channels of activity. In contrast, others adapt to strain through retreatism. The retreatist aspires neither to the conventional means nor the goals and retreats from goal attainment through the use of drugs and alcohol. While holding a permanent place in sociological criminological theory, Merton's theory failed to receive empirical support leading to calls for revision.

One such perspective to take on the challenge, Agnew's general strain theory (1992, 2001, 2006), builds on this classical tradition by defining new types of strain, distinguishing between objective and subjective strains, emphasizing the role of emotions in the genesis of crime and deviant coping, and by predicting what factors may increase the probability that an actor will react to strain with deviance. While Agnew (1992)

adopts goal blockage as a source of strain from the classical tradition, he adds two new major types of strain: strain as the presentation of negative stimuli and strain as the removal of positive stimuli. Strain is redefined as any event, issue or relationship in one's life that is perceived negatively. Subjective perceptions of strain are as important if not more so than objective indicators in predicting deviant or criminal behaviour. Strain is argued to generate negative affective states which produce the motivation for corrective action (Agnew 1992). The emotion of anger is particularly important in mediating the relationship between strain and crime (Agnew 1992, 2001, 2006) and depressive emotions like despair and hopelessness are related to deviant coping mechanisms like the use of drugs and alcohol.

Another important aspect of general strain theory is how individuals cope with stressful life experiences: not everyone reacts to strain by engaging in criminal activity. Agnew (1992) identifies several cognitive, behavioural and emotional coping strategies, which all emphasize that many actors may be able to cope with strain through legitimate channels of activity. General strain theory also identifies several conditioning variables that explain why certain individuals react to strain with crime and others do not. Socioeconomic status, social support, self-esteem, self-efficacy, attributions of adversity, deviant peers, deviant values, social control and low constraint/negative emotionality are all indentified as factors that may condition the effect of strain on crime and deviance (Agnew 1992, 2006; Agnew, Brezina, Wright and Cullen 2002). For example, individuals who are highly attached to conventional society and who come from advantaged backgrounds are less likely to cope with strainful circumstances by engaging in deviance.

On the other hand, an actor who has internalized deviant values and who spends lots of time with deviant peers will be more likely to react to strain with deviant behaviour.

The current research draws on classical and general strain theories to explain drug and alcohol use in Canada, using a general population sample. While the relationship between strain and drug use has been explored, few studies have examined how it may be related to alcohol use and most have analyzed school aged and university samples. Agnew (1992, 2006) argues that using drugs and alcohol can be interpreted as a method of coping with the negative emotions produced by strain, particularly feelings of depression, hopelessness, despair and anguish. I examine how objective indicators of strain and subjective perceptions of strain are associated with drug and alcohol use. I also pay particular attention to general strain theory's conditioning variables and to how they interact with objective and subjective indicators of strain in the prediction of drug and alcohol use.

Finally, the relationship between gender, strain and substance use is explored. Broidy and Agnew (1997) argue that the strains experienced by men and women may differ, and that those experienced by men may be more likely to lead to criminal coping (Broidy and Agnew 1997; Agnew 2006), although, predictions regarding drug and alcohol use are less clear since gender differences in substance use are more limited. More importantly, it is argued that there may be gender differences in how the conditioning variables moderate the relationship between strain and crime (Agnew 2006; Baron 2007). In attempting to explain the gender gap in offending, Agnew argues that women tend to be more socially controlled and are less likely to exhibit the personality traits of negative emotionality and low-constraint (Agnew 2006). Women may cope with

strain, more often than men, through legitimate channels of activity. Women may also be more concerned with interpersonal strain as the maintenance of relationships is argued to be particularly important to them. Additionally, it is argued that women tend to respond to strain with different emotions than their male counterparts. It is suggested that women may be more likely to internalize their problems and as a result, experience more depressive emotions that are less conducive to other directed crime (Agnew 2006; Broidy and Agnew 1997). I focus on how the relationship between strain and substance use may differ by gender. I also emphasize how some of general strain theory's conditioning variables like deviant values, deviant peers, social control, low constraint and social support, may differentially affect the alcohol and drug use patterns of males and females.

In terms of the structure and process required to accomplish the above listed goals of my thesis, I will first present an overview of classical and general strain theories, which will be followed by a review of relevant literature. As an organizational tool, eighteen hypotheses are derived from the theoretical framework and literature review, which will be followed by an in-depth discussion of methodology. My analysis will begin with a description of the data, chi-square tests of the independence of gender and GST's conditioning variables and with bivariate analysis of the relationships between strain, GST's conditioning variables, controls and drug and alcohol use. Multivariate analysis will succeed the bivariate analysis and will include main effect models as well as interaction models. Coefficient comparison tests will be used to compare the main and interaction effects by gender. Finally, a discussion and conclusion of the results and potential limitations of the thesis is provided.

CHAPTER 2 - THEORETICAL FRAMEWORK

CLASSICAL STRAIN THEORY

Robert Merton's work on strain theory was very influential in the development of the strain perspective. Merton (1968) emphasized the disjunction between means and goals as a source of strain. Strain is now understood as a negative emotional state characterized by frustration; its alleviation provides the motivation for corrective action (Agnew 1992, 2001, 2006). Corrective action may take the form of deviant behaviour. Cultural goals are argued to be equally distributed amongst the population while the means to achieve these goals are not (Merton 1968). These goals are passed down and maintained by three major institutions: the family, the school and the workplace. Merton argues that contemporary American culture places a strong emphasis on culturally defined goals but lacks the corresponding emphasis on the means to achieve those goals (Merton 1968). The central argument of Merton's theory is best described by his own words:

> It is, indeed, my central hypothesis that aberrant behaviour may be regarded sociologically as a symptom of dissociation between culturally prescribed aspirations and socially structured avenues for realizing these aspirations (Merton 1968:188).

The goal of monetary success or the 'American Dream' is particularly important in classical strain theory. An inability to achieve the goal of monetary success is considered to be a major source of strain. The ability to cope with this type of strain is differentially distributed throughout the population, with the means to achieve monetary success more readily available to the more affluent members of society. Lower class populations are less likely to have the means, like education, a well paying job or family

monies, to achieve monetary success. When faced with strain and the pressure for corrective action produced by goal blockage, people will tend to choose from a set of available procedures, the most efficient at achieving their goals (Merton 1968). Lacking conventional means and beset by greater strain and pressure, lower class populations will be more likely to use crime as a means to achieve their goals.

Central to the purposes of this thesis, is how individuals cope with strain. While classical strain theory predicts crime as a possible response to the negative affective state produced by strain, it is evident that many individuals do not engage in crime as a result of strain. Merton (1968) proposed a typology of adaptations to strain. He identified five possible adaptations: conformity, innovation, ritualism, retreatism and rebellion. A conformist is an individual who is socialized to accept prescribed cultural goals and also has the institutional means to achieve them. An innovator on the other hand, aspires to the same goals of monetary success and the American Dream but does not have the means to achieve them. The innovator uses crime as a tool to achieve monetary success and the American Dream (Merton 1968).

Retreatism is particularly related to the current research. According to Merton (1968), the retreatist no longer aspires to the dominant set of cultural goals and does not have the means to attain them. As a result, the retreatist is more likely to engage in self-defeating behaviours like the abuse of drugs and alcohol. While Merton's (1968) concept of the retreatist is relevant, Agnew's (1992, 2001, 2006) emphasis on coping mechanisms may provide a better understanding of why individuals use drugs and alcohol.

When unable to achieve monetary success, middle-class status or the American Dream, individuals may cope with the resultant strain by using alcohol and/or illicit

drugs. Agnew (1992, 2001, 2006) argues that despair and depression are emotional responses to strain that may increase the probability of passive coping like drug and alcohol use. Lower class populations tend to face greater strain in the form of structural disadvantage. Structural disadvantage may seem to be an insurmountable obstacle to many lower class individuals causing them to feel powerless to change their circumstances. From Agnew's perspective, we can interpret Merton's retreatist as an individual who may have once aspired to achieve monetary success but has given up in the face of hardship and uses substances to cope.

The classic strain theories of Merton (1938, 1968), A. Cohen (1955), and Cloward and Ohlin (1960) focus on one major type of strain: goal blockage. Failure to achieve monetary success or middle class status produces strain and a pressure for corrective action. Empirical tests of these theories that used the disjunction between aspirations and expectation as a measure of strain, largely failed to provide support for classical strain theory (Agnew 1992; although see Agnew, Cullen, Burton, Evan and Dunaway 1996; Baron 2006). Agnew contends that these theories do not account for the extensive nature of middle class delinquency, "neglect goals other than monetary success/middle-class status, neglect barriers to goal achievement other than social class and do not fully specify why only some strained individuals turn to delinquency" (Agnew 1992:51). To respond to these criticisms, Agnew (1985, 1992) provides a reconceptualization of strain theory which addresses and overcomes many of the weaknesses of classical strain theory.

GENERAL STRAIN THEORY

General strain theory (Agnew 1992, 2001, 2006) indentifies three major ideal types of strain: strain as the failure to achieve positively valued goals, strain as the removal of positively valued stimuli and strain as the presentation of negative stimuli. Like classical strain theory, GST (general strain theory) posits that the motivation for deviance is caused by a negative affective state. Particularly important is the emotion of anger but Agnew also emphasizes the role of depressive emotions in more passive coping like drug and alcohol use. When confronted with negative affect, individuals feel pressure to reduce or change their negative affective state. A more in-depth discussion of the role of emotions in GST will come later. For now, it is important to discuss the three major types of strain.

Agnew acknowledges the theoretical relevance of goal blockage as a source of strain and builds on classical strain theory by indentifying three subcategories of strain as the failure to achieve positively valued goals. They are: strain as the disjunction between aspirations and expectations/actual achievements, strain as the disjunction between expectations and actual achievements and strain as the disjunction between just/fair outcomes and actual outcomes.

STRAIN AS THE FAILURE TO ACHIEVE POSITIVELY VALUED GOALS

Strain as the failure to achieve positively valued goals is largely rooted in the classical tradition. However, Agnew (1992) draws on the body of empirical strain literature to provide a more comprehensive understanding of goal blockage as a source of strain. Merton's strain theory assumes a shared cultural value system that prescribes

social goals. While general strain theory does not dismiss this notion, the concept of goals is much more subjective and flexible. Subcultural goals become important. For middle-class youth, succeeding in school, finding a romantic partner and even the inability to secure alcohol for a Friday night are sources of strain that increase the probability of offending.

Agnew (1992) also addresses the immediacy of goals as relevant to the decision to offend. Aspirations are argued to be too idealistic; Individuals are not really expecting to achieve their ideal goals. Expected goals are more immediate and real to an individual. When faced with or reminded of immediate failure, one is more likely to experience the negative emotions associated with strain. Agnew argues that conceiving and measuring goal blockage as the disjunction between expectations and actual achievements, serves to strengthen the strain perspective.

A third type of goal blockage discussed by Agnew (1992, 2006) is strain as the disjunction between just/fair outcomes and actual outcomes. Here, it is argued that people enter into social relationships and institutions with the expectation of just and fair treatment. While outcomes are important, the expectation of an equitable relationship is central to this type of strain (Agnew 1992). By drawing on the equity literature, Agnew (1992) argues that individuals compare their inputs and outputs with those of the other individuals involved in the relationship. A state of inequity is argued to produce distress and the motivation for change. Individuals may try to increase their outcomes by theft, decrease the outcomes of others by assault, theft or vandalism and/or remove themselves from the relationship (Agnew 1992).

STRAIN AS THE REMOVAL OF POSITIVELY VALUED STIMULI AND PRESENTATION OF NEGATIVELY VALUED STIMULI

GST indentifies the removal of positive stimuli and the presentation of negative stimuli as important sources of strain. Agnew (1992) draws on aggression and stress literatures to claim that losing something meaningful may produce more strain than failing to achieve a goal that one has never experienced. Some examples of the loss of positively valued stimuli are: the end of a romantic relationship, divorce, the death of a loved one, being laid-off or fired from one's job, having objects of value stolen or losing money on the stock market. Similarly, stimuli which introduce unwanted, painful or irritating experiences in people's lives produce strain. Some examples of the presentation of negative stimuli are: physical, sexual or emotional abuse, criminal victimization, prolonged unemployment, physical punishment, negative experiences at school or at work or stressful life experiences in general. With both types of strain, there exists pressure for corrective action. Agnew (1992) argues that individuals may offend by trying to prevent the loss of the positively valued stimuli, terminate or alleviate the negative stimuli, retrieve the lost stimuli or replace it, seek revenge against those responsible for the presentation or removal of stimuli, and/or manage the negative affect created by strain by using drugs and alcohol.

Agnew's (1992, 2006) types of strain have been categorized separately but are conceptually interrelated. Losing one's job is the loss of a positively valued stimuli but it also blocks several goals like monetary success, and even basic sustenance in the case of the seriously disenfranchised. Being incarcerated can be interpreted as all three major types of strain. Any immediate goals one may have had are blocked and future goals are

seriously affected by having a criminal record. Many things individuals may have cherished are left behind when imprisoned, and for many, prison life is a negative experience. This example highlights the generality of strain that is characteristic of GST. Strain is no longer limited to goal blockage; rather it is extended to any experience which an individual perceives negatively.

It is important to note that the types of strain outlined by GST tend to emphasize subjective interpretations. Agnew discusses the difference between objective and subjective strain (see Agnew 2001; Agnew 2006; Baron 2004; Froggio and Agnew 2006). Objective strains are conditions or experiences that are generally disliked by everyone like structural disadvantage and unemployment. Subjective strain has more to do with interpretation and emotion, and of particular importance is whether the strain breaks conventional justice norms and is perceived as unjust (Agnew 2001). An individual may be immersed in inequitable relationships and fail to achieve their expected goals but if these strains are not interpreted negatively, they will not create the motivation for corrective action. However, it can be argued that higher levels of objective strain will increase the likelihood of subjective experiences of strain. Additionally, objective and subjective strain may interact in their prediction of drug and alcohol use. Individuals exposed to fewer objective strains may be less likely to subjectively experience the negative affective state associated with strain. Conversely, individuals who constantly face objective strains may be more likely to negatively interpret their situation and experience anger, depression and/or frustration.

Anger is a particularly important emotional response to strain in predicting criminal behaviour. Anger is seen as a response to being treated unjustly by others (Agnew 2001, 2006). When confronted with anger, the individual desires to react to the perceived injustice. Agnew associates three other emotions with anger: frustration, malicious envy and jealousy. Frustration in this context is similar to Merton's concept of frustration. Individuals having difficulty achieving their goals or fulfilling their desires will be frustrated by their situation. Malicious envy … "occurs when individuals feel they have the right to what others have. Such envy often involves feelings of inferiority, longing and ill will" (Agnew 2006:33). Jealously is contextualized as the potential loss of a romantic partner to a rival.

Anger and these related emotions increase the likelihood of engaging in criminal activity for several reasons. Already mentioned was the desire to react to a perceived injustice. Additionally, Agnew argues that anger reduces an individual's ability to cope in a legal manner as they are no longer thinking rationally and, "…tend to attribute malicious intent to the acts of others …" (Agnew 2006:33). Related to this is that an angry person is less likely to consider the long-term consequences of crime and rationally weigh the costs and benefits of engaging in such action. Anger also fuels the desire for revenge.

GST also postulates that different types of emotional responses to strain may elicit different coping mechanisms. For example, when confronted with anger or frustration, an individual may lash out at the source of the negative emotions in the form of assault, vandalism or theft. On the other hand, Agnew (1992, 2006) argues that those who

experience depression and its related emotions of anguish, despair, hopelessness and disappointment, may be more likely to use drugs or alcohol as a method of coping with strain. Unlike anger, which is associated with feelings of power and potency, depression is associated with feelings of powerlessness and the idea that one cannot change their situation (Agnew 2006). While this argument is logical, it may be difficult to separate these human emotions. People may feel angry about an injustice but when faced with the reality of being unable to change their situation, be overcome with depression. In this case, anger may lead to depression and be more likely to cause drug and alcohol use than aggressive criminal behaviour.

The above description of anger refers primarily to what Agnew (2006) labels state anger: anger as an emotional state triggered by an unpleasant life experience. Agnew distinguishes between state and trait anger but argues that they are intimately related. Trait anger refers to a stable personality characteristic. An individual characterized by high levels of trait anger is someone who gets angry on a regular basis, has a short temper and reacts with anger to seemingly innocuous situations. State anger is an immediate reaction to an unpleasant situation. Arguably, an individual high in trait anger would be more likely to react to negative life experiences with anger (see Capowich, Mazerolle and Piquero 2001; Mazerolle, Piquero and Capowich 2003). The same argument can be made with the depressive emotions outlined by Agnew (1992, 2006); an individual exposed to chronic and repeated strains may develop a general tendency toward depression, and be more likely to react to strainful experiences with despair, hopelessness or disappointment.

The relationship between traits and states becomes interesting when we relate it to experiences of strain. Agnew contends that “chronic or repeated strains lead to negative

emotional traits, which are conducive to crime" (Agnew 2006:39). Individuals or families living in poor, inner-city neighbourhoods experience a greater amount of strains more frequently. Thomas Bernard (1990) provides a list of some of these strains: they include but are not limited to high population density, pollution, criminal victimization, poverty, physically exhaustive and repetitive work environments. Repeated chronic exposure to strains will foster the development of negative emotional traits, which increase the likelihood of negative emotional states and in turn, the probability of responding to these states with deviant behaviour.

ADAPTATIONS TO, AND COPING WITH STRAIN

Another important aspect of GST is the degree to which an individual can cope with the negative emotions associated with strain. Agnew borrows from the stress literature to outline several cognitive, behavioural and emotional coping strategies (Agnew 1992). Many of these strategies do not involve delinquent adaptations to strain. For instance, a cognitive coping strategy may involve an individual assigning the most strainful experiences in their lives, relative or absolute unimportance (Agnew 1992). If one is struggling with unemployment, one can neutralize that strain by deciding that employment is no longer a desirable goal. This process minimizes the negative effects of strain and reduces the likelihood of a criminal response. Individuals may also accept responsibility for adversity, which can reduce the negative subjective experience of objective strain (Agnew 1992). In terms of behavioural adaptations, individuals may choose to reacquire the positive stimuli, achieve their goals or remove the negative stimuli. Behavioural coping strategies more often than not involve legitimate channels of

activity like visiting the unemployment office or finding a new romantic interest to replace a lost one. Emotional coping strategies involve dealing more directly with the negative emotions produced by strain. For example, individuals may use drugs or alcohol to suppress the emotions or physical exercise and deep breathing techniques to cope. GST must then reconcile why strains lead to deviant adaptations in some cases but not others.

One way GST addresses when and why strains lead to deviant adaptations is by specifying the types of strain that are most likely to lead to a deviant response. Strains that are perceived as highly unjust or that break normative justice rules are more likely to lead to criminal coping (Agnew 2001, 2006). Strains are also most likely to lead to deviance when they are high in magnitude, recency, duration, centrality and clustering (Agnew 1992). The perceived magnitude of a particular strain is simply its degree. For example, a desperate need for money is a greater strain than a small problem in an individual's financial accounting. Strains that are perceived as severe or high in magnitude influence an actor's ability to cope in a non criminal manner by decreasing the perceived costs of criminal coping and increasing the disposition to engage in criminal coping (Agnew 2001). Strains that are recent and clustered together will have a stronger effect on an individual. Chronic and enduring strains are more significant than brief passing ones. For example, chronic and enduring abuse that is high in magnitude and has recently surfaced in a clustering of events will create a very strong pressure for corrective action. Agnew explains the centrality of strain by arguing that "strain is central to the extent that is threatens core goals, needs, values, activities and or identities" (Agnew 2001:335). Judgments of the centrality of strain may be influenced by larger cultural or subcultural contexts.

INCREASING THE PROBABILITY OF USING DRUGS AND ALCOHOL TO COPE WITH STRAIN

STRUCTURAL FACTORS

We are left asking two essential questions: what differentiates individuals who respond to strain with deviant behaviour from those who cope with strain through legitimate channels of activity? By what process does this differentiation occur? GST does provide answers. As was previously discussed, social structure and its effects on deviance are important to both the Mertonian and general strain traditions. Agnew asserts that, "(I)ndividuals with resources like money, education, and "good jobs" are better able to cope in a legal manner than others" (Agnew 2006:95). Agnew suggests that the urban poor may face particularly strong economic/status demands and that few alternative goals are given cultural support. Agnew (1999, 2006) also proposes a macro level variant of GST. Similar arguments are put forth to explain community differences in offending, where "high levels of income or socioeconomic inequality lead some individuals to experience stress or frustration" (Agnew 1999:123). The central argument of this theoretical variant is that social aggregates characterized by high levels of economic inequality will tend to create, select for, and retain strained individuals (Agnew 1999). Additionally, living in these communities means a higher frequency of interactions between highly strained individuals, which serves to further exacerbate levels of criminal activity. While many of these arguments apply to criminal activity it follows that drug and alcohol use and abuse will be higher in these communities as well. Higher levels of strain will increase the need to cope in any fashion.

SELF-ESTEEM, SELF EFFICACY, SOCIAL SUPPORT AND PEERS

Self-esteem and self-efficacy condition strain by influencing an individual's sensitivity to objective strains and how they subjectively interpret them. They also affect one's ability to use cognitive, behavioural, and emotional coping strategies (Agnew 1992). Individuals high in self-esteem will be more resistant to stress as they feel confident they can deal with most problems. Individuals with a high degree of self-efficacy will feel that they can deal with problems through legitimate channels of activity. It follows, that people with low self-esteem and self-efficacy will be less apt to deal with strains and more likely to engage in deviant coping (Agnew 1992).

Conventional social support is also important in moderating the relationship between strain and deviance. According to Agnew (1992), there are three types of social support, which facilitate the major types of coping: informational support, instrumental support and emotional support. Individuals who have many conventional support resources are less likely to react to objective and subjective strain with deviance.

GST also draws on social learning theories (Bandura 1973; Akers 1985) to identify a "disposition to delinquency," which emphasizes the roles of attributions of adversity, deviant values and peers. In the social learning perspective, deviant values, attitudes and beliefs are learned just as conforming values are learned. Individuals who tend to attribute their adversity to others and hold deviant values and attitudes have a greater disposition to deviance. It is argued that deviant values and the process of making attributions of adversity are learned over the life course and are reinforced by deviant peer networks. Deviant peer groups provide role models and reinforcement for deviant behaviour and values (Agnew 1992). Deviant peers and values are argued to condition

the effect of strain on criminal activity. Individuals who think favourably of substance use, and whose peers reinforce these behaviours will be more likely to use substances as a result of strain.

SOCIAL CONTROL

Agnew (1992, 2001, 2006) predicts that social control mediates the relationship between strain and deviance, as well as interacts with strain in predicting it. I will provide a brief overview of control theory (Hirschi 1969) and then explore these relationships.

Control theorists (Hirschi 1969) argue that people engage in criminal or deviant behaviour relative to the extent that they are bound to conventional society. A strong social bond, characterized by high levels of attachment, commitment, involvement and belief, to or in conventional people, institutions, and morality, provides inhibitions to criminality (Hirschi 1969). These four aspects are highly related to one another and all contribute to the relative strength or weakness of the social bond. The weaker the social bond, the greater the probability of offending. The concept of attachment is simply the extent that individuals are bound to conventional others, care about their opinions and/or experience some degree of empathy. Commitment and involvement are interrelated. Those committed to conventional avenues of success such as, educational attainment, establishing a career and having a family are less likely to deviate as they have more to lose. Involvement in these activities requires a large commitment of time and therefore, limits one's opportunity to engage in crime. The belief aspect of the bond is the degree to which individuals believe in conventional society's shared value system.

Strain theory emphasizes the presence of negative social relationships in the genesis of crime while control theory emphasizes the absence of positive relationships. The fact that the two theories are rooted in different fundamental assumptions makes their integration problematic. Agnew (2001, 2006) integrates social control into GST by arguing that negative social relationships and life experiences lower the possibility of forming positive conventional relationships, and that low social control does not facilitate legitimate coping. Hirschi actually makes a similar argument in 1969 while discussing the amoral man's aggressiveness:

> The process of becoming alienated from others often involves or is based on active interpersonal conflict. Such conflict could easily supply a reservoir of socially derived hostility sufficient to account for the aggressiveness of those whose attachments to others have been weakened (Hirschi 1969:233).

Hirschi is putting forth the claim that interpersonal conflict alienates individuals from one another (reducing attachment) and can account for aggressive tendencies. This argument is in accord with one of GST's central premises: negative relationships producing anger which produce the motivation for aggressive, other directed crime. The theoretical assumptions of the two theories may not be reconciled but they can be used in accordance with one another to further the explanation of deviance.

Agnew argues that "(I)ndividuals low in direct control, conventional attachments, and conventional commitments, generally lack the social supports and resources that facilitate non-criminal coping" (Agnew 2001:335). He continues to assert that individuals with a high degree of social control will not likely engage in crime. The costs of crime are too high and they are likely to be socialized to conventional means as well as goals. At the same time, chronic or repeated strains may lead to long-term reductions in social

control. Many strains involve "negative treatment by conventional others, like parents, spouses, teachers, and employers" (Agnew 2006:42). Some of these strains include harsh discipline, poor grades in school, physical or sexual abuse and unemployment. GST postulates that chronic exposure to these types of strain lowers social control by fostering less attachment, commitment, involvement and belief to, or in conventional people and institutions (Agnew 2006). As patterns of strain and reductions in social control continue over the life course, individuals become more and more likely to employ deviant coping mechanisms.

LOW CONSTRAINT AND NEGATIVE EMOTIONALITY

Agnew et al. (2002) draw on the personality trait literature to identify negative emotionality and constraint as two master personality traits, which are of particular importance to whether an individual reacts to strain with deviance. Individuals with low constraint are: "… impulsive, are risk taking/sensation seeking, reject conventional societal norms and are unconcerned with the feelings and rights of others" (Agnew et al. 2002). Agnew admits that the definition of low constraint very closely parallels the definition of low self-control (Gottfredson and Hirschi 1990). The trait of negative emotionality can also be related to the concept of irritability and the propensity for physical response to conflict outlined by Gottfredson and Hirschi (1990) in their discussion of low self-control. Agnew prefers to use the terms low constraint and negative emotionality as they do not carry the theoretical connotations of self-control theory. Like self-control, negative emotionality and low constraint are said to develop as a result of ineffectual child rearing, characterized by the lack of monitoring, supervising

and punishing of problem behaviours. Characteristics of strain, a history of mistreatment from others and strainful negative life experiences more generally are also important in the genesis of negative emotionality and low constraint (Agnew et al. 2002).

Within the GST framework, negative emotionality and low constraint are argued to reduce one's ability to cope with strain through legitimate channels of activity: "(I)ndividuals high in negative emotionality are much more likely to experience events as aversive, to attribute these events to the malicious behaviour of others, to experience intense emotional reactions to these events …" (Agnew et al. 2002:46). Individuals characterized by low constraint will be prone to risky behaviours, be less likely to envision the costs of deviant behaviour and ultimately less able to cope through non-criminal means (Agnew et al. 2002). Agnew et al. (2002) identify a reciprocal relationship between experiences of strain and these personality characteristics. Negative life experiences help to foster the development of low constraint and negative emotionality. Low constraint and negative emotionality increase the probability of reacting to strain with deviance, which in turn increases experiences of strain.

GENDER AND STRAIN

Gender also plays a significant role in explaining differential reactions to strain. Broidy and Agnew (1997) attempt to explain the gender gap in offending, specifically in relation to violent and other directed crimes by adapting general strain theory. They assert that males are more likely than females to experience strains conducive to criminal coping and to cope with these strains through other directed crime (Agnew 2006; Broidy and Agnew 1997). Broidy and Agnew (1997) make it clear that they are not arguing that

females experience less strain or that their strain is insignificant in some way. Rather, they contend that females are exposed to different forms of strain which are less likely to result in criminal coping and other directed crime. According to GST, males are more likely than females to experience harsh discipline, have negative secondary school experiences, be part of abusive peer relations, be criminally victimized and become homeless (Agnew 2006; Broidy and Agnew, 1997). It is argued that these strains are more likely to be perceived as "high in magnitude," "seen as unjust," "associated with low social control" and "create some incentive or pressure to engage in crime" (Agnew 2006). As a result, these strains are more likely to lead to feelings of anger and to the desire for revenge, which both increase the probability of engaging in other directed crime.

Women are more likely to experience strains associated with the care of conventional others like children, spouses and elderly parents as well as assume greater responsibility for household management (Agnew 2006; Broidy and Agnew, 1997). Broidy and Agnew (1997) postulate that women may in fact experience more strain than men as they often take on careers and financial responsibilities as well as their responsibilities to their families. It is also argued that females may be more concerned with the success of personal relationships and as such, are more likely to be negatively affected by interpersonal strains. Empirical studies testing this hypothesis have largely failed to provide support; rather they have found that interpersonal strain affects both genders similarly and that the same strains that lead to crime in males lead to crime in females (see Agnew and Brezina 1997; Hoffman and Su 1997).

Women are more likely to be exposed to sexual abuse, partner abuse and gender discrimination (Agnew 2006; Broidy and Agnew 1997). It is further argued that the strains experienced by women are more likely to lead to depression and feelings of helplessness, which are not conducive to engaging in violent, other directed crime. Women will be more likely to internalize their problems and engage in self-destructive behaviours like abusing drugs and alcohol (Agnew 2006; Broidy and Agnew 1997). Men are more likely to engage in crime as the strains they experience are more conducive to crime as they tend to produce anger and the desire for revenge. However, it is likely that while women may experience more strain than men and strain that is more conducive to depression, men will still have higher rates of drug and alcohol use than women because of the conditioning effects of social control, low constraint and negative emotionality, deviant values, deviant peers and social support.

It is through Agnew's (1992, 2002, 2006) conditioning variables that gendered patterns of offending can be best understood. Agnew argues that males are exposed to fewer direct controls than females. Direct controls are imposed by parents and institutions and refer to the amount of control that is exercised over one's behaviour and life choices (Agnew 2006). As a result, males tend to have more opportunities to engage in crime. Males are "less strongly tied to the household, less likely to be sanctioned for aggressive behaviour, more weakly tied to school, and less likely to condemn crime" (Agnew 2006:137). In addition, it is argued that males tend to be characterized by higher degrees of negative emotionality and low constraint than females are, meaning that they are more prone to anger and risky behaviour. All of this suggests that females tend to have higher levels of social and self-control than males and as such, are more likely to cope with

strain through legitimate channels of activity. If greater social control is exercised over females then they are also less likely to associate with deviant peers and embrace deviant values as they have more ties to conventional society. Having fewer deviant peers and values than their male counterparts will also reduce the likelihood that strain will lead to drug and alcohol use in women. Women may also have greater conventional social support resources as the maintenance of meaningful interpersonal relationships is argued to be particularly important to women. It is also possible that there exist gender differences in what variables condition the effect of strain on drug and alcohol use (see Baron 2007). However, Broidy and Agnew (1997) note that males and females will react to strain with similar behaviours if they experience similar levels of strain and have similar access to the conditioning variables.

CHAPTER 3 - LITERATURE REVIEW

GENERAL SUPPORT FOR GST – STRAIN, ANGER AND CONDITIONINING VARIABLES

The positive relationship between subjective and objective strains on crime, net of the effects of other theoretically relevant variables and controls, has largely been confirmed (Agnew et al. 2002; Agnew and White 1992; Baron 2004, 2007, 2008; Froggio and Agnew 2006; Mazerolle and Piquero 1998; Piquero and Sealock 2000). Longitudinal analyses of this relationship has confirmed causality (see Aseltine, Gore and Gordon 2000; Hoffman and Su 1997; Mazerolle and Maahs 2000) and Aseltine et al. (2000) provide support for a reciprocal relationship between strain and crime. Findings also generally support the relationship between strain and anger and anger and crime (Baron 2004, 2007, 2008; Broidy 2001; Mazerolle, Burton, Cullen, Evans and Payne 2000; Mazerolle and Piquero 1998; Piquero and Sealock 2000; Piquero and Sealock 2004). However, with the exception of a few studies (see Baron 2004, 2008), anger tends to only predict violent other directed crime and does not seem to be related to drug use, property crime or other forms of deviance. Support for the mediating role of anger between strain and crime has been weak.

Research on the role of GST's conditioning variables has been supportive (Agnew et al. 2002; Agnew and White 1992; Baron 2004, 2007, 2008; Peter, Lagrange and Silverman 2003; Mazerolle et al. 2000; Mazerolle and Maahs 2000). The most consistent conditioning relationships observed are those between objective and subjective strains, subjective strain and deviant peers, subjective strain and social control, subjective strain and deviant values and subjective strain and negative emotionality/low constraint. Higher

scores in measures of subjective strain, increased the likelihood of some form of deviant coping when individuals also scored higher on measures of objective strain, deviant peers, deviant values, negative emotionality/low constraint, and lower on measures of social control.

Of particular interest here is the review of studies which include measures and tests of the effects of objective strain, subjective strain, social control, low constraint and negative emotionality/self-control, deviant peers, deviant values, gender and their interactions on deviance. Furthermore, studies that contain drug and alcohol use in their measures of crime, or as dependent variables will provide the potential for additional valuable insight.

Agnew and White's (1992) findings support many of GST's theoretical predictions. Several measures of strain were significantly related to both delinquency and drug use, net of controls. Negative life events, life hassles and neighbourhood problems were all positively associated with drug use when controlling for social control, delinquent peers, age and gender (Agnew and White 1992). Agnew and White also tested two of GST's conditioning variables: self-efficacy and delinquent peers. Self-efficacy conditioned the effect of strain on delinquency as predicted (Agnew and White 1992). Individuals characterized by greater self-efficacy were not as likely to engage in delinquency as a response to strain. Delinquent peers conditioned the effect of strain on drug use and delinquency (Agnew and White 1992). Strain was more likely to lead to delinquency and drug use if an individual associated with a greater number of delinquent peers. Males were more likely than females to use drugs and engage in delinquency.

Research conducted on the relationship between strain, anger and delinquent adaptations to strain by Mazerolle and Piquero (1998), supports several of GST's predictions. Strain was positively associated with delinquency and anger; perceptions of equity and the removal of positive stimuli were positively associated with violent crime and property crime respectively (Mazerolle and Piquero 1998). The perceptions of equity measure was the only strain variable to remain significant once deviant peers and values were added to the model. Anger was positively related to other directed violent crime but did not mediate the effect of strain on crime (Mazerolle and Piquero 1998). This suggests that perhaps other emotional responses to strain may be important in predicting different forms of delinquency. Furthermore, the effects of deviant peers and values in this research demonstrate how important these variables are in predicting deviance.

Piquero and Sealock (2000) report results similar to Mazerolle and Piquero (1998) in terms of strain, negative affect and crime. Strain predicted violent and property crime net of controls. Anger was only significantly related to violent crime and not to property crime. Depression was not directly related to either type of crime (Piquero and Sealock 2000). Piquero and Sealock (2000) also found that having strong social coping resources was associated with greater violent and property crime, contrary to GST's predictions. They acknowledge that it could be the case that the respondents, who were all high risk offenders, socially coped through deviant peer networks. In contrast, they found that having spiritual coping resources insulated or protected against property crime.

Mazerolle et al.'s (2000) findings are generally supportive of GST with some exceptions. Strain only was only positively related to violent crime; school delinquency and drug use were not affected by strain measures. Similar to findings reported by

Mazerolle and Piquero (1998), anger was only related to violent crime and it did not mediate the relationship between strain and crime. However, their findings also suggest that social control and an affiliation with deviant peers are particularly important in predicting drug use. While strain did not predict drug use independently, strain interacted with social control and deviant affiliations to predict levels of drug use. High levels of social control protected against the effects of strain making it less likely that strain would lead to drug use (Mazerolle et al. 2000). Deviant peers had the opposite effect, conditioning strain making it more likely that strain would lead to drug use (Mazerolle et al. 2000).

Aseltine et al. (2000) tested general strain theory with a longitudinal analysis. Their findings support general strain theory with various measures of strain being related to deviant behaviour. Family conflict and having experienced aversive life events were significantly and positively related to violent crime and marijuana use. Aversive life events was the only strain measure to predict non-violent delinquency (Aseltine et al. 2000).

The mediating role of anger in the production of deviant behaviour was also tested. As predicted by GST, all measures of strain were significantly and positively related to anger (Aseltine et al. 2000). However, while anger predicted aggressive forms of delinquency and mediated the relationship between family conflict and aggression, it failed to predict marijuana use and delinquency (Aseltine et al. 2000).

Aseltine et al. (2000) provide weak support for the role conditioning variables play in GST. While ninety-six interaction effects were tested, only ten were significant and of these ten some were not in the predicted direction (Aseltine et al. 2000). The

interaction of delinquent peers and strain was negatively associated with delinquency; strain had a greater effect on delinquency when an individual had fewer delinquent peers. This finding is contrary to the interaction effects reported by other researchers (see Agnew and White 1992; Mazerolle et al. 2000; Baron 2004) and can partially be explained by a weak delinquent peers measure.[1]

Mazerolle and Maahs (2000) provide strong support for the conditioning influences of deviant values, deviant peers and low self-control or low constraint and negative emotionality on strain. In both cross-sectional and longitudinal analyses, these variables significantly conditioned the effects of strain on crime. For example: "At high levels of strain, for example, delinquent participation increases from 37 percent to 67 percent to 93 percent across increasing levels of delinquent peer exposure" (Mazerolle and Maahs 2000:765). Similar results were found for measures of deviant values and low constraint and negative emotionality.

Agnew et al. (2002) support GST's theoretical predictions and provide some insight into the relationship between strain and some of the conditioning variables. Family strain, school hatred, neighbourhood strain, parents losing control of their feelings and low constraint/negative emotionality were positively related to a general measure of delinquency (Agnew et al. 2002). The social control variable, school attachment, was negatively associated with delinquency (Agnew et al. 2002). A significant and positive interaction effect between strain and low constraint/negative emotionality was reported (Agnew et al. 2002). Strain had a stronger effect on delinquency for individuals

[1] The delinquent peers measure suffered by virtue of a peer matching system. Respondents were asked to name the peers they spent the most time with at school (Aseltine et al., 2000). The researcher then had to match their friend's self reported delinquency to construct the measure. 83% percent of respondents could not be matched with their delinquent peers at time three. Moreover, friends outside of school were not taken into account.

characterized by lower levels of constraint and higher levels of negative emotionality. Other interaction effects were tested including the conditioning effect of social control on strain. As predicted by GST**,** social control (measured by school attachment) protected against, or increased the ability to cope with, strain (Agnew et al. 2002).

Peter et al. (2003) studied the interdependence of strain and self-control (or as Agnew et al., 2002 and Agnew, 2006 argue: negative emotionality and low constraint) in explaining delinquency. Peter et al. (2003) found significant independent effects of strain and self-control measures on delinquency. Self-control was the strongest predictor of general delinquency but strain also maintained an effect when both predictors were included in the model (Peter et al. 2003). Strain and self-control positively interacted in their prediction of property and drug offences. Strain was more likely to lead to drug use in individuals characterized by negative emotionality and low constraint.

Baron (2004) used a sample of four hundred street youth to test the effect that several types of strain have on crime and his findings generally support GST. Measures of strain were positively associated with both anger and crime. Anger was positively related to total crime but did not fully mediate the relationship between strain and crime (Baron 2004). When total crime was disaggregated, the results were similar for property crime but only property victimization (a form of strain), anger, deviant peers and deviant values predicted drug use (Baron 2004). The effects of some conditioning variables were also tested. Several of GST's conditioning variables interacted with strain in the production of crime, including deviant peers and deviant attitudes (Baron 2004). Individuals who had a greater amount of deviant peers and who could be characterized by deviant attitudes were more likely to engage in crime as a result of strain.

OBJECTIVE AND SUBJECTIVE STRAINS

Agnew (2001, 2006) and Froggio and Agnew (2006) distinguish between objective and subjective strain. Objective strain is characterized by an event or condition that is generally disliked by most people or a specific group of people. Subjective strains are events or conditions that an individual perceives negatively (Agnew 2001, 2006; Froggio and Agnew 2006). Individuals tend to differ in their perceptions of objective strain. How these two types of strain interact and what differentiates how individuals react to strain is what is of particular interest to the current research.

Froggio and Agnew (2006) tested whether people evaluate the objective strains they experience in a negative manner and how this is related to crime. Their findings support the hypothesis that subjective experiences of strain are more strongly associated with crime. As predicted, strains high in perceived negativity were significantly associated with crime while those with low perceived negativity were not (Froggio and Agnew 2006). Controls for self-control, gender and two variables that could be conceived of as social control (school status, living with family), were included in the model but their moderating influence was not tested. Light and hard drug use was included in the analysis as a measure of crime but all reported regressions were on total crime (Froggio and Agnew 2006). This paper provides strong initial support for the conceptual separation of objective and subjective strain.

Baron (2006) examines a more complete model of classical strain theory, effectively utilizing subjective measures of strain to strengthen the model. Baron (2006) finds that relative deprivation was positively associated with total crime, property crime

and violent crime whereas monetary dissatisfaction was only related to property crime. Homelessness and unemployment, objective strain measures, were also significantly and positively associated with property crime and total crime respectively. Baron also finds that deviant peers and deviant values were significant predictors of all measures of crime (Baron 2006).

Baron (2006) includes several interaction terms in his models, four of which deal directly with the interaction of objective and subjective strain on crime: relative deprivation and unemployment, relative deprivation and homelessness, monetary dissatisfaction and unemployment and monetary dissatisfaction and homelessness. The interaction of relative deprivation and unemployment did not significantly predict any form of crime (Baron 2006). The other three interactions were positively related to total crime, property crime, violent crime and drug crime, with the exception of the relationship between monetary dissatisfaction, unemployment and property crime (Baron 2006). These findings suggest that at higher levels of objective strain, subjective experiences of strain are more likely to elicit a criminal response.

Baron (2008) explored the factors which may untangle the link between unemployment and crime. Using general strain theory, Baron examined how internal or external attributions of unemployment may predict situational anger over one's unemployment as well as predict, mediate and moderate the effects of strain on property crime, violent crime and drug crime. How one's anger over unemployment subsequently predicted crime was also of interest (Baron 2008). Internal attributions of unemployment were a strong predictor of one's anger about being unemployed and that anger was

positively related to violent crime and drug sales (Baron 2008). However, the attribution measures largely failed to significantly predict measures of crime (Baron 2008).

The amount of effort one put into finding a job was significantly and positively related to anger over unemployment but negatively related to violent crime and drug sales. As Baron (2008) points out, this variable can be interpreted through the control perspective. While a strong commitment to finding employment and failing to do so may cause one to be angry, that very commitment to conventional avenues of monetary success reduces the likelihood that one will respond to strain with crime. One's commitment to finding a job also significantly interacted with unemployment in predicting drug sales (Baron 2008). During longer periods of unemployment the desire to find a job reduced the likelihood that one would engage in crime. This supports the prediction that social control moderates the relationship between strain and crime and potentially drug and alcohol use.

Gender was important in predicting violent crime with males being more likely to engage in violence than females. Deviant values and peers were strong predictors of all crime measures. The subjective strain variables of monetary dissatisfaction and relative deprivation were also strong predictors of crime (Baron, 2008). The interaction term of unemployment and monetary dissatisfaction was positively related to both violent crime and drug sales. During longer periods of unemployment one's dissatisfaction with their financial situation was stronger and had a greater influence on crime.

Of the studies reviewed, few have examined the link between strain and alcohol use but some have found that objective and subjective strains (particularly having experienced negative life events) are related to drug use (Agnew and White 1992; Aseltine et al. 2000; Baron 2004; Hoffman and Su 1997; Mazerolle et al. 2000; Peter et al. 2003). In terms of the conditioning variables, delinquent peers and social control were found to significantly interact with measures of strain in predicting marijuana use (Agnew and White 1992; Mazerolle et al. 2000), and low constraint and negative emotionality was also found to condition the effect of strain on drug use (Peter et al. 2003). Strain was more likely to lead to marijuana use in individuals characterized by low constraint and negative emotionality and in those who had many delinquent peers and less social control. Other studies which have supported the role conditioning variables play in the strain crime link, have included alcohol and drug use in their measures of total crime/delinquency (see Agnew et al. 2002; Agnew and Brezina 1997; Froggio and Agnew 2006; Mazerolle and Maahs 2000); these studies are not ideal for specifying the link between strain and drug and alcohol use because one cannot untangle these behaviours from the rest of the crime measures. I will now review several studies which have focused explicitly on the relationships between strain and drug and alcohol use.

Peirce, Frone, Russell and Cooper (1994) examine the relationship between economic strain, depression and alcohol use/abuse. They found that chronic and acute financial strain were both positively associated with depression but that everyday chronic experiences of financial strain were more important (Peirce et al. 1994). They also found that depression and chronic financial strain had direct effects on drinking to cope.

Depression only partially mediated the relationship between chronic financial strain and alcohol use (Peirce et al. 1994). The frequency of social contact was also positively related to alcohol use, suggesting a peer effect. They also found that depression was related to developing alcohol related problems and that males were significantly more likely than females to drink as a result of strain (Peirce et al. 1994).

Jasinski, Asdigian and Kantor (1997) explore how work stress may be related to alcohol use and household violence. Central to the purpose of their paper is how ethnicity may influence these relationships. They found that all forms of work stress measured, were positively associated with alcohol use and household violence in Hispanic males but that only measures of work stress were related to alcohol use in white Anglo males (Jasinski et al. 1997). The authors argue that the ethnic differences can likely be accounted for by virtue of Hispanic men being more likely to experience chronic stressors like poverty and unemployment. Furthermore, Jasinski et al. (1997) suggest that perhaps getting fired has a different meaning for Hispanic men because they are exposed to greater institutional racism. Also of interest is that alcohol use mediated the relationship between work stress and household violence, suggesting that alcohol is a catalyst in the occurrence of household violence.

Liu and Kaplan (2001) closely examine the relationship between social control, family or role strain and illicit drug use. Consistent with control theory, the authors find that individuals who are married or who are in long-term relationships, and who have children at home are less likely to use illicit drugs than those who are single and have no children living at home (Liu and Kaplan 2001). Having children and being married are interpreted through the control perspective and as such are seen as commitments to

conventionality. Liu and Kaplan (2001) only measure one type of strain, family strain. They found that measures of family strain only predicted illicit drug use when interacting with measures of commitments to conventionality (Liu and Kaplan 2001). Individuals who were committed to conventionality were more likely to react to family strains with illicit drug use. This finding is somewhat contradictory to the predictions of GST and to the findings of other researchers (see Agnew and White 1992; Mazerolle et al. 2000) as social control should protect or insulate against the effect of strain. However, as Agnew (1992) argues, strains experienced in areas of great importance to one's life are more likely be perceived negatively and create pressure to cope.[2]

Preston (2005) provides a look at chronic marijuana use, using strain, peer delinquency and self-control as key explanatory variables. Measures of subjective strain, deviant peers and low self-control were all significantly related to chronic marijuana use in the predicted direction (Preston 2005). Measures of objective strain were not related to chronic marijuana use.[3] Preston (2005) also reports some interesting findings surrounding the relationship between gender and drug use. Males were significantly more likely to be chronic users than females but surprisingly, subjective strain, deviant peers and low self-control all had stronger effects on females' chronic marijuana use.

Drapel (2005) illustrates the importance of the links between strain, depressive emotions and drug use. Both of Drapel's strain measures, negative life events and negative parental reactions to dropping out of school, were positively associated with

[2] Liu and Kaplan (2001) only measure family strain; studies which have found the opposite relationship between social control, strain and drug use have included an indexed measure of negative life events (see Agnew and White 1992; Mazerolle et al. 2000).

[3] This finding may be explained by the weakness of Preston's (2005) objective strain measure. A nine item scale was constructed based on the amount of social assistance the family was receiving. Families receiving more social assistance were assumed to be facing more financial strain. It is possible that these families were not as financially strained because they were receiving greater amounts of social assistance.

despair and drug use (Drapel 2005). She also found that despair only partially mediated the relationship between strain and drug use but that both variables maintained positive main effects on drug use. Social control was negatively related to drug use, and peer's delinquent attitudes and time spent with peers were positively related to drug use (Drapel 2005). When the sample was disaggregated by gender, negative life events predicted drug use for males but not for females and despair for females but not for males (Drapel 2005). Drapel suggests that males may be more prone to deviant coping and that females may be more likely to use legitimate coping strategies.

In a paper studying the relationship between work related strains, negative affect and alcohol use, Swatt, Gibson and Piquero (2007) provide strong support for the feasibility of using GST to explain alcohol use. Using a sample of over nine-hundred Baltimore police officers, they found that subjective strain, measured by negative experiences on the job, was the strongest predictor of depression and anger (Swatt et al. 2007). Legitimate coping strategies like the use of social support were negatively associated with anger and depression. They also report that female police officers were more likely to experience both anger and depression (Swatt et al. 2007). Consistent with GST's predictions, Swatt et al. (2007) report that the relationship between strain and alcohol use and strain and problem drinking was mediated by experiences of depression and anxiety. They also found that legitimate coping through spiritual channels was negatively associated with drinking (Swatt et al. 2007). Male officers were also more likely to report problem drinking behaviours than female officers (Swatt et al. 2007).

Jukkala, Mäkinen, Kislitsyna, Ferlander and Vågerö (2008) studied how economic strain and gender was related to binge drinking in a random sample of twelve-

hundred people living in Moscow, Russia. The authors found that men with economic problems were twice as likely to binge drink than those with no economic problems, but that women were less likely to binge drink if they experienced economic strain (Jukkala et al. 2008). A type of social control effect was also observed; being married or cohabiting had a protective or insulating effect on a woman's likelihood of binge drinking but had no effect for men (Jukkala et al. 2008). Time spent with peers was positively associated with women's binge drinking but again no peer effect was found for men (Jukkala et al. 2008). The authors suggest that these differences could be embedded in the gender roles and in the expectations of gendered behaviour in Moscow.

GENDER

Of the studies reviewed, one of the most widely reported finding on gender differences is that males are more likely than females to engage in delinquency, interpersonal aggression and violent crime (Agnew and White 1992; Agnew et al. 2002; Aseltine et al. 2000; Baron 2004, 2006, 2008; Froggio and Agnew 2006; Mazerolle et al. 2000; Mazerolle and Piquero 1998; Peter et al. 2003; Piquero and Sealock 2000). Findings on the relationship between gender, strain and drug and alcohol use have not been so universal. Agnew and White (1992) report that males are more likely to use drugs than females and Preston (2005) reports that males are more likely to be chronic users but other studies have failed to find a significant relationship between gender and drug use (see Aseltine et al. 2000; Baron 2004; Hoffman and Su 1997; Mazerolle et al. 2000). In the few studies that have examined gender, strain and alcohol use, males have been found

to be more likely than females to drink and to react to strain with alcohol use (Jukkala et al. 2008; Peirce et al. 1994; Swatt et al. 2007).

Drapel's (2005) findings on the relationship between strain, gender and drug use suggest that negative emotions like depression and anxiety may be particularly important in the prediction of female drug use and that females may be more likely than males to engage in legitimate coping strategies. The following review will focus on studies that compare the relationship between strain and deviant coping by gender, and which focus on the effect of negative emotions on deviant coping strategies.

Agnew and Brezina (1997) attempt to apply classical strain theory to explain gender differences in patterns of delinquency. They argue that females may be more affected by interpersonal strain than by economic strain, as they may be more concerned about the quality of their relationships than by economic success (Agnew and Brezina 1997). Females were not more likely than males to engage in delinquency (measured by school related offences and drug and alcohol use) as a result of interpersonal strain. In fact, interpersonal strain was more strongly related to delinquency in males. The only variable significantly associated with female delinquency was positive relations with the opposite sex, suggesting peer and social learning effects (Agnew and Brezina 1997). Females in this study may have been engaging in delinquency with their more delinquent male counterparts. While this study measured social control and deviant values and beliefs, it did not address how and whether these factors may condition the effect of strain by gender.

In a longitudinal study of GST, Hoffman and Su (1997) also fail to provide support for the hypothesis that interpersonal strain may be more related to delinquency in

females than in males. Rather it is shown that the process predicted by GST is similar for both genders (Hoffman and Su 1997). Stressful life events were positively associated with delinquency and drug use for males and females (Hoffman and Su 1997). While there were some differences in gendered patterns of offending, the study largely failed to show any difference in how males and females react to strain. Hoffman and Su (1997) did not include measures of deviant peers and deviant attitudes in their model and did not examine any gender differences that may be related to GST's conditioning variables. Moreover, as demonstrated by Drapel's (2005) findings, the emotional response to strain may be more important than the type of strain in predicting gender differences.

Mazerolle (1998) also reports finding few gender differences in how strain related to delinquency. However, he does find that strain does not seem to be related to violent delinquency in females; rather, having delinquent attitudes and peers seem to be more important in predicting female violent crime (Mazerolle 1998). Interestingly, his measure of negative relations with adults was significantly and positively associated with delinquency in females but not in males (Mazerolle et al. 1998). This provides some support for the argument that interpersonal strain may be more important in predicting delinquency among females (see Broidy and Agnew 1997; Hoffman and Su 1997).

Broidy (2001) confirms many of GST's predictions and provides some analysis of gender differences. Measures of strain, including unfair outcomes, blocked goals and stress were all positively associated with anger and anger was positively related to crime (Broidy 2001). Broidy also constructs an index for "other negative emotions," which include feeling guilty, worthless, disappointed, depressed, insecure and worried. Broidy's generalized stress measure was the only strain measure that was related to other negative

emotions. Also of interest is that males were significantly less likely to experience "other negative emotions" which were largely depressive and self defeating emotions. This finding supports the hypothesis put forth by Broidy and Agnew (1997) which states that females are more likely than males to experience depressive emotions as a result of strain. As previously stated, depressive emotions may be more likely to lead to self-destructive behaviours like drug and alcohol use rather than to other directed crime. The index "other negative emotions" was not significantly related to crime (Broidy 2001); perhaps this is because measures of drug and alcohol use were not included in the measure of crime or as separate outcome variables.

Broidy (2001) also explores the role that legitimate coping strategies may play in GST. Stress was positively related to legitimate coping, which highlights one of GST's most interesting dilemmas: being able to predict how and why certain individuals respond to strain with crime. Coupled together, Broidy's (2001) findings on gender, negative emotions and legitimate coping strategies provide some insight. The index "other negative emotions" predicted the use of legitimate coping strategies, suggesting that some emotional responses may be more likely to lead to legitimate coping than to crime. At the same time, females are more likely than males to experience these depressive emotions and are more likely to utilize legitimate coping strategies (Broidy 2001). The differences in emotive responses to stress may be understood through gender differences in GST's conditioning variables (social support, social control, deviant values, deviant peers and low constraint/negative emotionality). Females may experience different emotions than males and be less likely to engage in crime as a result of higher social control and constraint and fewer deviant attitudes and peers.

Piquero and Sealock (2004) provide a test of Broidy and Agnew's (1997) gendered GST which yields some supportive results. Females were significantly more likely than males to experience both anger and depression (Piquero and Sealock 2004). The gender/anger relationship runs contrary to GST's predictions but does not remove the possibilities that the type of anger women experience may be different, and that other variables like social control insulate against criminal coping. Strain led to depression among males but not among females which is also contrary to GST predictions. However, as expected, strain and anger led to interpersonal aggression among males but not among females, which suggests that females are somehow protected against the negative affect (Piquero and Sealock 2004). Similar results are reported for property offending. Depression was not related to interpersonal aggression or property crime (Piquero and Sealock 2004). Finally coefficient comparison revealed that the effect of strain significantly varies across gender with it more strongly affecting males.

Baron (2007) tests Broidy and Agnew's (1997) gendered GST on a sample of street youth. He finds that female street youth actually experienced more anger than their male counterparts (Baron 2007). Baron (2007) reports that regardless of gender, objective and subjective financial strains increased the likelihood of property and violent crime. However, some relevant gender differences in how several conditioning variables interact with strain were found. When compared to males, subjective financial strain had a stronger impact on female violent crime when females' reported attitudes favorable to deviance and when they had more deviant peers (Baron 2007). Subjective financial strain had a greater effect on property crime when males made external attributions for their strain; and homelessness, an objective indicator of strain, positively interacted with

deviant attitudes in associating with male property crime (Baron 2007). These findings suggest that the impact of strain is moderated by different factors depending on one's gender.

SUMMARY

Overall, the studies reviewed provide strong support for GST and for its ability to explain crime and substance use but mixed support for its capacity to explain gender differences. The conceptual separation and the interaction of subjective and objective strains were shown to be important in explaining the use of deviant coping strategies (Baron 2006, 2008; Froggio and Agnew 2006). While the positive relationships between strain and anger and anger and crime are consistently reported, support for the mediating role of anger is weak (Aseltine et al. 2000; Baron 2004, 2006, 2008; Broidy 2001; Mazerolle et al. 2000; Mazerolle and Piquero 1998; Piquero and Sealock 2000; Piquero and Sealock 2004). Furthermore, anger only tends to be related to interpersonal aggression and violent crime suggesting that other emotional responses may be important in predicting substance use.

Only a few studies have examined the feasibility of using GST to explain drug and alcohol use. Of the studies that have examined the effect of strain on substance use, all provide strong preliminary support (see Agnew and White 1992; Aseltine et al. 2000; Drapel 2005; Hoffman and Su 1997; Jasinski et al. 1997; Jukkala et al. 2008; Liu and Kaplan 2001; Mazerolle et al. 2000; Peirce et al. 1994; Preston 2005; Swatt et al. 2007;). Depressive emotional responses to strain have been shown to be important in the prediction of drug and alcohol use (Drapel 2005; Swatt et al. 2007).

The relationship between strain, depressive emotions and substance use has also been shown to be important in explaining gender differences (Drapel 2005; Swatt et al. 2007). The idea that interpersonal strain may be more significant in predicting female deviant coping has generally not been supported with the exception of Mazerolle et al.'s (1998) findings. Several studies have found that strain affects both genders in a similar fashion (see Baron 2007; Hoffman and Su 1997; Mazerolle et al. 1998) but that it tends not to be related to violent crime in women (see Mazerolle et al. 1998; Piquero and Sealock 2004). In some studies, females reported experiencing more anger and depressive emotions than males (see Baron 2007; Piquero and Sealock 2004; Swatt et al. 2007) but they were still less likely to engage in deviant coping. This suggests that women must have other protective influences that help them to cope legitimately. Differences in levels of social support, social control, deviant peers, deviant values and low constraint/negative emotionality as well as how these variables may differentially condition the effect of strain on deviant coping (see Baron 2007) can help to explain gender differences in substance use.

While support for the moderating influence of GST's conditioning variables has been strong, only a few studies have examined how these variables may condition the effect of strain on drug use (see Agnew and White 1992; Mazerolle et al. 2000). The current research extensively explores how social support, social control, deviant peers, deviant values and low constraint/negative emotionality condition the effect of strain on drug and alcohol use, and how they may shed light on gender differences. Finally, with the exception of a few studies, the majority of research on GST has been conducted on

adolescent or university populations. The current research uses a national population sample of Canadians to address this concern and provide greater generalizability.

CHAPTER 4 - HYPOTHESES

Based on the current research's theoretical framework and the findings outlined in the literature review, a number of hypotheses are proposed.

Hypothesis 1: Merton (1968) and Agnew (1992, 2001, 2006) argue that individuals experiencing objective economic strains will have an increased probability of reacting to those strains with deviance.

1. Respondents scoring higher on measures of objective economic strain will be more likely to cope with strain by using alcohol and drugs.

Hypothesis 2 and 3: Agnew (1992, 2001, 2006) distinguishes between objective and subjective strains and argues that the subjective experience of strain may be more important in predicting deviance (see Froggio and Agnew 2006). Moreover, as evidenced by Baron's (2006, 2008) findings, objective and subjective strain can interact in their prediction of deviant adaptations to strain. At higher levels of objective strain, subjective strain had a stronger effect on deviance. It is hypothesized that:

2. Respondents scoring higher on levels of subjective strain will be more likely to use drugs and alcohol.

3. And, that measures of objective and subjective strain will interact in their prediction of drug and alcohol use. The effect of subjective strain on drug and alcohol use will be stronger for those respondents scoring high on objective strain.

Hypotheses 4 and 5: Agnew (1992, 2001, 2006) argues that social control functions as a constraint to deviant coping, making it less likely that individuals high in social control will engage in deviance. He also argues that social control conditions the effect of strain on deviant coping such that high social control reduces the probability that individuals will cope with strain through deviance. Therefore, it is hypothesized that:

4. Respondents scoring high on measures of social control will be less likely to use drugs and alcohol.

5. In addition, measures of social control and strain are expected to interact in their prediction of drug and alcohol use. The effect of the subjective and objective strain measures on drug and alcohol use will be weaker for respondents with high levels of social control.

Hypotheses 6 and 7: Agnew et al. (2002) and Agnew (2006) argue and provide evidence that low constraint, characterized by impulsivity and risk taking behaviours, predicts deviance and positively interacts with strain in predicting deviance. Therefore, I expect that:

6. Respondents scoring low on measures of constraint will be more likely to use drugs and alcohol.

7. Further, it is suggested that measures of low constraint will condition the effect of strain on crime. Respondents' experiencing high level of strain will be more likely to use drugs and alcohol when they have low constraint.

Hypotheses 8 and 9: As demonstrated by the prior literature review and argued by Agnew (1992, 2001, 2006), deviant peers and values consistently predict crime, delinquency and drug use. Furthermore, it is argued that deviant peers and deviant values moderate the effect of strain's relationship with deviance. It is predicted that:

8. Respondents scoring high on measures of deviant peers and deviant values will be more likely to use drugs and consume alcohol.

9. Further, measures of deviant peers and deviant values will moderate the effect of strain on the use of drugs and alcohol. The effect of objective and subjective strain measures on drug and alcohol use will be greater for those individuals scoring high on measures of deviant peers and deviant values.

Hypothesis 10 and 11: Agnew (1992, 2001, 2006) puts forth the idea that various forms of social support including, informational support, instrumental support and

emotional support facilitate legitimate coping. Social support is argued to moderate strain's relationship with deviance, decreasing the probability of deviance at high levels of social support. It is expected that:

10. Respondents scoring high on measures of social support will be less likely to use drugs and alcohol.

11. And that social support and strain will interact in the prediction of substance use in that, strain will be less likely to lead to drug and alcohol use at high levels of social support.

Hypotheses 12 and 13: It is theorized by Agnew (1999, 2006) that certain resources like education for example, reduce the likelihood of deviant behaviour and that these resources condition the effect of strain on deviance. Education is important to predicting how individuals will cope with the negative effects of strain because a good education can provide individuals with more alternatives to deviant coping as well as a greater knowledge base surrounding the long-term consequences of crime (Agnew, 2006). I therefore hypothesize that:

12. Respondents scoring high on measures of education will be less likely to use drugs and alcohol.

13. And, measures of education will condition the effect of strain on drug and alcohol use, such that strain will have a weaker effect on drug and alcohol use at high levels of education.

Hypotheses 14 and 15: Broidy and Agnew (1997) and Agnew (2006) argue that males and females may experience different strains and that the strains experienced by males are more likely to lead to deviant coping. However, they also postulate that females may experience more strain than males as they often have to manage household, familial and fiscal responsibilities at the same time. Further, they argue that gender may condition

the coping response to strain and that different strains may differentially affect males and females. Males are argued to be more concerned with material success while females are more concerned with strains arising from interpersonal relationships (Broidy and Agnew, 1997). Additionally, as evidenced by Dedovic, Wadiwalla, Engert, and Pruessner (2009), as a result of gender socialization women are more likely than men to interpret events as stressful and have more stress related health problems (also see Turner and Avison (2003) for evidence that women tend to report experiencing more recent life stressors than men). While females may be exposed to more objective financial strain than males, males may be more likely than females to interpret financial strain negatively and cope with it through deviant behaviour; however, subjective reports of stress and health may be more important to predicting female deviant behaviour. Therefore, it is expected that:

14. Females will experience more strain, scoring higher on measures of objective and subjective strain

15. In addition, gender differences in how objective strains and subjective strains are related to drug and alcohol use are expected. More specifically, the effect of objective financial strain on substance will be stronger for males than for females, while the effect of subjective strains on substance use will be stronger for females than for males.

Hypotheses 16, 17 and 18: Broidy and Agnew (1997; and Agnew 2006) argue that because of socialization, females tend to have more social control and more constraint. Further, it has been argued that females are less likely to hold deviant values and associate with deviant peers but are more likely to have outlets of social support. Taken together, these factors reduce the likelihood that females will cope with strain through deviance (Agnew 2006). However, females with low social control, low constraint, many deviant peers and values and few social support resources will have the

same probability as similarly defined males to engage in deviant coping. While Broidy and Agnew argue that women's emotional responses to strain may be more likely to lead to self destructive behaviours like the abuse of drugs and alcohol than to other directed crime, they do not predict gendered patterns of substance use. It is suggested, however, that the moderating role of social control, low constraint, deviant peers, deviant values and social support differentially condition the effect of strains on alcohol and drug use by gender (Agnew 2006, Broidy and Agnew 1997). Hence, I hypothesize that:

16. Females will demonstrate higher levels of social control, constraint and social support but have fewer deviant peers and lower levels of deviant values than males.

17. And, that the conditioning effects of social control and social support measures on the effects of strain on drug and alcohol use will be stronger for females than for males.

18. On the other hand, the conditioning effects of low constraint, deviant peers and deviant values on the effects of strain on drug and alcohol use will be stronger for males than for females.

CHAPTER 5 - METHODOLOGY

DATA

The current research uses data from the Canadian Alcohol and Drugs Survey conducted in 1994 by Statistics Canada. The data is not publicly available; it was made available by the Queen's University Social Science Data Centre. The target population was persons living in Canada fifteen years of age or older. The survey utilized a stratified random sampling method whereby each of the ten provinces was divided into strata and Random Digit Dialing was carried out (The Yukon and North West Territories were excluded). A response was obtained from 12,155 households, yielding a response rate of 75.6% (16,082 households were contacted). By design, this sampling method excluded full-time residents of institutions, households that do not have telephones and people who live on the street. While this sample may exclude some smaller specific populations, it is a strong random population sample.

MEASURES

Strain Variables

Objective Strain. Merton (1968) as well as Agnew (1992, 1999, 2006) argue that an inability to achieve monetary success is a significant source of strain. Further, Agnew (2001) and Froggio and Agnew (2006) argue that objective strain is an event or condition that is generally disliked by most people or a specific group of people; the failure to achieve monetary success is an example of objective strain (Agnew, 2006). Peirce et al. (1994) utilize an index of economic strain to test the relationships between economic

strain, depression and alcohol use. While the index used by Peirce et al. (1994) captured a range of financial problems like how often a family could not afford food, medical care, clothes and family leisure activities, it is argued here that individuals with very low incomes will experience the same kind of problems. Therefore, objective Strain will be measured by the respondent's household income. While this exact type of measure has not readily been used in the literature, it is theoretically derived and captures the objective economic conditions of respondents. Respondents were asked to rank their household income: 0 no income, 1) < $5,000, 2) $5,000 – $9,999, 3) $10,000 – $14,999, 4) $15,000 - $19,999, 5) $20,000 – $29,999, 6) $30,000 - $39,999, 7) $40,000 - $59,999, 8) $60,000 – $79,999, 9) $80,000 or more. Responses were reverse coded so that higher scores represented lower income and more objective strain.

Subjective Strain (see theoretical framework for definition). Two measures of subjective strain were used in the analysis: subjective strain measured by stress and negative life experiences measured by health. The first was a generalized strain measure based on the amount of stress one experiences in their everyday lives (see Broidy 2001 for a similar measure). Respondents were asked to describe their life in the past year relative to stress. There were four response categories: 1) very stressful, 2) stressful, 3) not very stressful and 4) not at all stressful. Responses were reverse coded so that higher scores represented more stress or strain. Agnew (1992) argues that any life experience that is perceived negatively by an actor is a source of strain; Agnew and White (1992) and Aseltine et al. (2000) use negative life event scales to measure this type of strain and self-reported health problems is an item that is represented in these scales. As a result, the second subjective strain measure was one that captured negative life experiences based

on the respondent's current self-reported health. This measure is conceptualized as subjective as it is the respondent's self-reported health and not the opinion of a medical professional; some individuals may be more likely to interpret health issues as problematic. Respondents were asked to describe their health in general; responses varied from 1 – 5: 1) excellent, 2) very good, 3) good, 4) fair, 5) poor. Respondents scoring high on this variable are argued to experience more subjective strain.

Conditioning Variables

Social Control (see theoretical framework for definition). Social control was a dichotomous variable constructed from a question that asked respondents about their marital status. Respondents were asked whether they were married, in a common law relationship, single/never married, a widow/widower, divorced or separated. Individuals who were single, widowed, divorced or separated were given a score of 0, representing lower social control, and those who were currently married or in a common law relationship were given a score of 1, representing higher social control. Sampson and Laub (2005) argue that levels of social control change over the life course as the individual encounters different turning points and acts and reacts to their environment. Social control is not conceived as a stable enduring characteristic, rather it is fluid and changing as the individual becomes married or divorced or begins or terminates employment (Sampson and Laub 2005). Therefore, respondents who reported being single, widowed, divorced or separated were all given a score of 0 as they were not currently attached to a significant other while those who were married or in a common law relationship were. This variable is argued to represent the attachment and

commitment (Hirschi, 1969) level of the social bond (see Liu and Kaplan (2001) who operationalize marriage as commitment to conventionality).

Low Constraint. Agnew et al. 2002 and Agnew (2006) argue that the concepts of low constraint and negative emotionality are essentially the same as Gottfredson and Hirschi's (1990) concept of low self-control. Gottfredson and Hirschi (1990) argue that low self-control can be measured by analogous deviant behaviours like smoking, gambling and getting into traffic accidents as they reflect impulsivity and getting a quick thrill (see Paternoster and Brame 1998; and see MacDonald et al. 2005 for an example of a behavioural measure of self-control).

The current research measured the concept of low constraint by combining gambling and smoking behaviours into an indexed measure. Smoking was a dichotomous variable measured by respondents reporting whether they currently identified as a smoker. Gambling was measured by a categorical variable asking respondents to report the frequency of their lottery and betting activities. Responses varied from 0-4: 0) never, 1) less than once a month, 2) 1-3 times a month, 3) once a week and 4) more than once a week. Both variables were standardized and then added together. Respondents with low constraint identified as smokers and gambled more frequently as compared to those with high constraint who did not identify as smokers and gambled infrequently.

Deviant Peers. Two separate deviant peers measures were used in the analysis: alcohol using peers and drug using peers. For alcohol using peers, respondents were asked how many of their friends drank alcohol: 0) none, 1) a few, 2) about half, 3) most, 4) all. Drug using peers was a question that asked respondents how many of their friends

used the drugs that were previously mentioned in the survey: 0) none use them, 1) a few use them, 2) about half use them, 3) most use them, 4) all use them.

Deviant Values. Using principal component analysis (PCA), eight related dimensions were analyzed to find a principal component and create a measure of deviant values. Respondents were asked a series of questions about whether they believed that certain programs or efforts to control drinking and drug use should be increased, decreased or remain the same. Some examples are: 1) should the legal drinking age be increased, decreased or remain the same, 2) should alcohol and drug prevention programs be increased, decreased or remain the same and 3) should efforts to prevent drunks from being served be increased, decreased or remain the same. Respondents were given a score of 0 if they believed that things should remain same, a score of -1 if their value was less supportive or drinking and drug use and a score of 1 if their value was more supportive of drinking and drug use. In the literature, similar measures of deviant values are employed by researchers (see Mazerolle and Maahs 2000; Mazerolle and Piquero 1998). Once all eight variables had been coded in this fashion PCA was used to construct the measure of deviant values. Principal component analysis is a method of indentifying patterns in data. Using STATA 9.1, eigenvalues were derived from eigenvectors. The highest eigenvalue represents the principal component and the most significant relationship between the eight deviant values dimensions; as a result, this component was chosen to measure deviant values (see Kroonenberd, Lammers and Stoop (1985) for an extensive exploration of PCA and De Groof (2008) for a more recent application).

Social Support. Social support was based on a question that asked respondents how supportive their family and friends were with problems in the past year. Responses

varied from 1 – 5: 1) very helpful, 2) helpful, 3) somewhat helpful, 4) not helpful, 5) don't have family and friends. The responses were reverse coded so that higher scores represented more social support.

Religiosity/Spirituality. Religiosity/spirituality is conceived of as a social support type variable based on work done by Jang and Johnson (2005) on religion, gender, strain and interpersonal aggression. Respondents were asked to rate their level of religious subscription: 1) very religious/spiritual, 2) moderately religious/spiritual, 3) not very religious/spiritual and 4) not at all religious/spiritual. Responses were reverse coded so that higher scores represented greater religiosity/spirituality and more social support.

Education. Education is conceived of as a resource, which at high levels reduces the likelihood of deviant behaviour as it provides people with alternatives to deviant coping as well as a greater knowledge base surrounding the long-term consequences of crime (Agnew, 2006). Respondents were asked what their highest level of education was. Responses varied from 0 – 9: 0 other education/training, 1) master's, PhD or post doctorate, 2) university - less than master's, PhD or post doctorate, 3) some university, 4) community college, 5) some community college, 6) secondary, 7) some secondary, 8) elementary, 9) no schooling. The category "other education/training" was removed from the education variable as its meaning was ambiguous and the frequency of response was very low. Additionally, because of a very low frequency, category 9, no schooling, was combined with category 8), elementary, so that the lowest level of education became category 8), no schooling/elementary. Responses were reverse coded so that higher scores represented more education.

Control Variables

Gender. Gender is a dichotomous variable. Females were given a score of 0 and males a score of 1.

Age. Age is an ordinal variable with 15 levels. Respondents were asked which age range they fit into: 1) 15-16, 2) 17-19, 3) 20-24, 4) 25-29, 5) 30-34, 6) 35-39, 7) 40-44, 8) 45-49, 9) 50-54, 10) 55-59, 11) 60-64, 12) 65-69, 13) 70-74, 14) 75-79, 15) 80+.

Dependent Variables

Drinking Frequency. Drinking frequency is an ordinal variable with 7 levels. Respondents were asked how often they drank alcohol in the past 12 months. The categories were: 0) not at all, 1) less than once a month, 2) 1-3 times a month, 3) once a week, 4) 2-3 times a week, 5) 4-6 times a week, 6) everyday.

Drinking to Cope. Drinking to cope with life is a dichotomous variable based on a question which asked respondents whether they drank to forget their worries in the past 12 months. A score of 0 was given to those who did not drink to forget their worries and a score of 1 was given to those who did.

Binge Drinking. Binge Drinking is count variable based on a question which asked respondents who had already identified as drinkers how many drinks they usually had at once in the past 12 months; this means that 0 drinks is not a possibility and that the lowest response was 1.

Marijuana/Hash Use. Marijuana/hash use is a dichotomous variable which measured whether or not a respondent had used marijuana or hash in the past 12 months.

A score of 0 was assigned to respondents who had not used marijuana or hash and a score of 1 to those who had.

Using Marijuana/Hash to Cope. Using marijuana or hash to cope with life is a dichotomous variable based on a question which asked respondents whether they used the drugs to cope with stress in the past 12 months. A score of 0 was assigned to respondents who did not use marijuana or hash to cope with stress and a score of 1 was given to those who did.

Hard Drug Use. Hard drug use is a dichotomous variable based on whether respondents had used 1 of 4 hard drugs in the past 12 months. The drugs in question were heroin, acid, speed and cocaine/crack. A score of 0 was assigned to respondents who had not used any of these drugs in the past 12 months and a score of 1 to those that had.

Prescription Drug Use. Prescription drug use is a dichotomous variable based on whether respondents had used 0, 1, 2, 3 or 4 prescription drugs types in the past twelve months. Categories 2-4 were added to category 1 as their frequencies were very low; category 1 represents the use of 1 to 4 prescription drug types. The drugs in question were tranquilizers/valium, diet pills/stimulant, anti-depressants and codeine/demerol /morphine.

MISSING DATA

Because of the variables I chose to work with, missing data became a significant issue. For example, 3,842 respondents chose not to report their household incomes which meant that only 8,313 respondents out of 12,155 are represented by the objective strain measure. Inputting data or assigning mean values to over 31% of the sample is not

feasible so the default method for dealing with missing data provided by STATA 9.1 was used. This means that large portions of the sample are not represented in the analysis, and with this comes the possibility that there may be something different about the people who chose not to report their household. However, it is also possible that there is no clear pattern as to why respondents chose not to report their household incomes. Moreover, the sample sizes achieved in the analysis are still very large and represent respondents all over Canada

METHOD OF ANALYSIS

The statistical procedures used in this thesis were conducted using STATA 9.1. A description of the data will first be presented; then, to compare levels of the independent variables by gender, chi-square tests will be used for dichotomous and ordinal measures, while a z-test for large samples will be used to determine any significant differences in the means of low constraint and deviant values (see Healey 2009 for formulas). Bivariate analyses using regression will be carried out on all seven dependent variables; the appropriate type of bivariate regression will be selected for based on the level of measurement of the dependent variable (Long 1997).

In the multivariate analysis different regression models were used depending on the level of measurement of the dependent variables. Given that binge drinking is a count variable, I started with the poisson regression but settled on Zero Truncated Negative Binomial Regression as there was evidence of overdispersion, which suggested a preference for NBR; further, binge drinking did not include the possibility of having zero drinks which suggests that a truncated model should be used (Long, 1997). Logistic

Regression was used to model binary dependent variables as in this case, OLS is inappropriate because it can lead to out of range predictions, abnormally distributed errors and non constant error variance (Fox 1997). Ordered Logistic Regression was used to model ordinal dependent variables as OLS fails to capture the ordinal nature of data because it assumes an equal distance between categories (Long 1997). Analyses will first be carried out on the full sample and then on the samples that were disaggregated by gender. All regressions were run using the *robust* option in STATA 9.1 to obtain robust standard errors as by design, the data tended to be clustered together which biases standard errors downward; robust standard errors reduce the likelihood of making a type 1 error.

To test for significance in the coefficients between male and female samples, I followed the approach adopted by Paternoster et al. (1998), who specify a z-test formula, which takes into account the standard deviation of the sampling distribution of coefficient differences. Moreover, previous formulas overestimated differences in coefficients, increasing the probability of type 1 errors (Paternoster et al. 1998).[4]

Following Aiken and West's (1991) method for creating interaction terms in multiple regression, including logistic regression (Özbay and Köksoy 2009; Svesson 2003), twenty-four interaction terms were created by standardizing all variables of interest and then multiplying each conditioning and control variable (social control, low constraint, deviant peers, deviant values, social support, spirituality, education and age), with the exception of gender, by all three strain variables (also see Agnew et al. 2002;

[4] z-test formula from Paternoster et al. (1998)

$$Z = \frac{b_1 - b_2}{\sqrt{SEb_1^2 + SEb_2^2}}.$$

Agnew and White 1992; Baron 2004; Mazerolle and Maahs 2000). Two additional interaction terms were created by multiplying the two types of subjective strain by the objective strain measure. Standardizing lower order variables prior to creating interaction terms reduces multicolinearity between the product terms and the variables from which they were developed (Aiken and West 1991). As discussed by Mazerolle and Maahs (2000), using multiplicative interaction terms in multiple regression provides a very conservative test of interaction effects. Each model was re-run twenty-six times on each of the seven dependent variables to test for interaction effects in the full sample and then on the samples that were disaggregated by gender. The z-test from Paternoster et al. (1998) will also be used to compare male and female interaction coefficients.

Because of the number of interaction terms tested, interpretation will be limited to the significance and direction of the interaction effects and further probing of the coefficients will not be conducted (see Aseltine et al 2000; Baron 2004; Mazerolle et al. 2000; Peter et al. 2003; Özbay and Köksoy 2009, for similar interpretations). The method of probing for interpretation of interaction coefficients in logistic regression outlined by Jaccard (2001) seems more relevant to smaller multivariate models (see Svesson 2003 for an example). This strategy, while useful for in depth odds ratio interpretations of interaction coefficients, is not ideal for the current research as I am more interested in examining a greater breadth of interactive relationships and more specifically, whether GST's conditioning variables significantly moderate the effects of strain on different drug and alcohol use behaviours (see Özbay and Köksoy (2009) for a similar interpretation of logistic regression interaction terms and Mazerolle and Maahs (2000) for a look at different strategies of interpretation).

CHAPTER 6 - RESULTS

DESCRIPTIVE STATISTICS

Tables 1, 2 and 3 present the descriptive statistics for all independent and dependent variables. The majority of the variables are ordinal or dichotomous with the exceptions of binge drinking, deviant values and low constraint. The means, standard deviations, minimums and maximums are reported for all relevant variables but frequency percentages are displayed for dichotomous and ordinal variables.

In general, the household incomes of respondents were low; 60.18% of the sample indicated that their household income was $39,999 or less. However, the most frequent response was to have earned between $40,000 and $59,999, representing 21.85% of the sample. Levels of subjective strain or stress experienced by the sample were quite varied; 47.90% of respondents reported that their lives were not very stressful or not at all stressful. About thirty eight percent (38.01%) of the sample reported that their lives were stressful and 14.09% reported that their lives were very stressful. In general, the respondents reported few negative life experiences as measured by health; 89.19% of the sample reported being in good or better than good health while only 8.71% and 2.10% reported being in fair or poor health respectively.

In table 2, social control is characterized by 46.27% of respondents being single and 53.73% of respondents being married or in a common law relationship. Low constraint is a standardized index so its mean is very close to 0. Substantively, the most frequent response was having high constraint with 28.96% of the sample not identifying as a smoker and never playing the lottery or engaging in any form of betting.

Table - 1 Descriptive Statistics - Strain Variables		
Objective Strain (household income)		
	Frequency	Percentage
1 - > $80,000	641	7.71%
2 - $60,000-$79,999	854	10.27%
3 - $40,000-$59,999	1,816	21.85%
4 - $30,000-$39,999	1,323	15.91%
5 - $20,000-$29,999	1,220	14.68%
6 - $15,000-$19,999	717	8.63%
7 - $10,000-$14,999	779	9.37%
8 - $5,000-$9,999	547	6.58%
9 - < $5,000	304	3.66%
10 - no income	112	1.35%
Total	8,313	100%
Subjective Strain (stress)		
	Frequency	Percentage
1 - not at all stressful	1,847	15.44%
2 - not very stressful	3,882	32.46%
3 - stressful	4,546	38.01%
4 - very stressful	1,685	14.09%
Total	11,960	100%
Negative Life Experiences (poor health)		
	Frequency	Percentage
1 - excellent	3,000	24.99%
2 - very good	4,408	36.72%
3 - good	3,299	27.48%
4 - fair	1,045	8.71%
5 - poor	252	2.10%
Total	12,004	100%

Table - 2 Descriptive Statistics - Conditioning Variables

Social Control (marriage)

	Frequency	Percentage
1 - currently single	5,558	46.27%
2 – marriage/C-Law	6,453	53.73%
Total	12,001	100%

Low Constraint

Mean	.002
Standard Deviation	1.507
Minimum	-1.692
Maximum	3.159

Deviant Peers (alcohol using)

	Frequency	Percentage
0 - none	1,015	8.52%
1 - a few	3,007	25.24%
2 - about half	1,556	13.06%
3 - most	4,571	38.36%
4 - all of them	1,766	14.82%
Total	11,915	100%

Deviant Peers (drug using)

	Frequency	Percentage
0 - none	8,001	69.46%
1 - a few	2,585	22.44%
2 - about half	348	3.03%
3 - most	533	4.63%
4 - all of them	51	0.44%
Total	11,960	100%

Deviant Values

Mean	.000
Standard Deviation	1.427
Minimum	-2.581
Maximum	6.495

Social Support

	Frequency	Percentage
1 - no family/friends	43	0.38%
2 - not helpful	375	3.36%
3 - somewhat helpful	874	7.82%
4 – helpful	2,260	20.23%
5 - very helpful	7,620	68.21%
Total	11,172	100%

Religiosity/Spirituality

	Frequency	Percentage
0- not at all spiritual	2,719	23.96%
1- not very spiritual	2,617	23.06%
2- moderately spiritual	4,843	42.67%
3 - very spiritual	1,170	10.31%
Total	11,349	100%

Education

	Frequency	Percentage
1 – none/elementary	663	5.50%
2 - some secondary	2,641	23.01%
3 – secondary	2,881	25.10%
4 - some community college	882	7.68%
5 - community college	1,570	13.68%
6 - some university	981	8.55%
7 – university	1,449	12.62%
8 - Masters or PHD	413	3.60%
Total	11,480	100%

At the other extreme, fewer respondents engaged in the behaviours characteristic of low constraint; only 6.35% of respondents identified as smokers and gambled more than once a week. The frequency patterns for drug using and alcohol using peers were quite different with respondents typically having few drug using peers but many alcohol using peers. To characterize this, 66.71% of respondents reported having no drug using friends while 52.14% of respondents reported that most or all of their friends drank. The measure of deviant values is an index comprised of standardized measures and created by PCA, therefore, its mean is 0.[5] Levels of social support were generally very high with the majority of respondents (68.21%) stating that their friends and family were very helpful with problems in the past year. Levels of spirituality in the sample were quite varied: 47.02% of respondents reported that they were not very religious/spiritual or not at all religious/spiritual while 42.67% and 10.31% of the sample reported being moderately religious/spiritual and very religious/spiritual respectively. The level of education in the sample was relatively low with 53.88% of the sample having a secondary school education or lower; however, 13.68% of respondents had community college degrees and 12.62% had university degrees.

Looking to table 3, in terms of control variables, 54.25% of the sample was female and 45.75% was male. The most frequent age category was 30-34, representing 12.84% of the sample and 34.63% were between the ages of 30 and 44; only 6.44% of respondents were between the ages of 15 and 19, 18.49% were between the ages of 20 and 29, 25.97% were between the ages of 45 and 64 and 14.46% were 65 years of age or older.

[5]In PCA all inputted dimensions are standardized prior to deriving the principal component

Table - 3 Descriptive Statistics - Control and Dependent Variables

Gender		
	Frequency	Percentage
0 - Female	6,594	54.25%
1 - Male	5,561	45.75%
Total	12,155	100%

Age		
	Frequency	Percentage
1 - 15-16	308	2.53%
2 - 17-19	475	3.91%
3 - 20-24	1,048	8.62%
4 - 25-29	1,200	9.87%
5 - 30-34	1,561	12.84%
6 - 35-39	1,433	11.79%
7 - 40-44	1,215	10.00%
8 - 45-49	985	8.10%
9 - 50-54	807	6.64%
10 - 55-59	698	5.74%
11 - 60-64	667	5.49%
12 - 65-69	621	5.11%
13 - 70-74	531	4.37%
14 - 75-80	326	2.68%
15 - 80+	280	2.30%
Total	12,155	100%

Dependent Variables (past 12 months)

Drinking Frequency		
	Frequency	Percentage
0 - do not drink	3,288	27.36%
1 - < once a month	2,421	20.15%
2 - 1-3 times a month	2,274	18.93%
3 - once a week	1,705	14.19%
4 - 2-3 times a week	1,582	13.17%
5 - 4-6 times a week	396	3.30%
6 - everyday	348	2.90%
total	12,014	100%

Drinking to Cope		
	Frequency	Percentage
0 - do not drink to cope	7,721	88.36%
1 - drink to cope	1,017	11.64%
total	8,738	100%

Binge Drinking	
Mean	2.788
Standard Deviation	2.737
Minimum	1
Maximum	50

Marijuana/hash Use		
	Frequency	Percentage
0 - did not use	10,896	92.37%
1 - did use	900	7.63%
Total	11,796	100%

Marijuana/Hash to Cope		
0 - do not use to cope	11,626	98.63%
1 - do use to cope	162	1.37%
total	11,788	100%

Hard Drug Use		
	Frequency	Percentage
0 - did not use	11,640	98.63%
1 - did use	162	1.37%
Total	11,802	100%

Prescription Drug Use		
	Frequency	Percentage
0 - no drugs used	9,330	79.13%
1 - 1 - 4 drug types used	2,461	20.87%

With the exception of binge drinking, the dependent variables were dichotomous and ordinal; 11.64% of respondents reported drinking to cope, 7.63% of respondents reported using marijuana/hash, only 1.37% of respondent reported using marijuana/hash to cope and 1.37% of respondents reported using hard drugs. Cumulatively, the frequency of drinking was generally low; 66.28% of respondents reported drinking 1-3 times a month or less and 27.30% stated that they did not drink at all in the past year. However, 14.15% of the sample reported drinking once a week and 13.13% reported drinking 2-3 times a week. The level of binge drinking in the sample was also relatively low with the mean drinks at once in the past year being 2.788. The prevalence of prescription drug use was also low; 79.13% of respondents did not use any of the prescription drugs mentioned in the past year. However, 18.01% of respondents used at least one prescription drug and 2.87% used 2 or more.

Table 4 presents the results of chi square-tests (see Healey 2009 for chi square formula) of the independence of strain variables and gender to test whether women tend to experience higher levels of objective and subjective strains than men do; column percentages are displayed for ease of interpretation. The results of all three chi square tests are highly significant at $p<.001$ suggesting that gender and strain are not independent and as predicted, the column percentages demonstrate that women tend to experience more subjective and objective stressors than men do. While the differences may be small, when examining the stress results, a clear pattern emerged whereby men were more likely than women to report that their lives were not very stressful or not at all stressful and women were more likely than men to report that their lives were stressful or very stressful.

Table - 4 Chi square Tables Testing the Independence of Strain and Gender (column percentages displayed)

	Gender		
Subjective Strain (stress)	Female Frequency(%)	Male Frequency(%)	Total Frequency(%)
1 - not at all stressful	963 (14.83%)	884 (16.17%)	1,847 (15.44%)
2 - not very stressful	2,047 (31.53%)	1,835 (33.56%)	3,882 (32.46%)
3 - stressful	2,498 (38.48%)	2,048 (37.45%)	4,546 (38.01%)
4 - very stressful	984 (15.16%)	701 (12.82%)	1685 (14.09%)
Total	6,492 (100%)	5,468 (100%)	11,960 (100%)
Pearson Chi2 df=3	**19.501 p<.001**		

	Gender		
Negative Life Experiences (poor health)	Female Frequency(%)	Male Frequency(%)	Total Frequency(%)
1 - excellent	1,666 (25.54%)	1,334 (24.33%)	3,000 (24.99%)
2 - very good	2,425 (37.19%)	1,983 (36.16%)	4,408 (36.72%)
3 - good	1,684 (25.82%)	1,615 (29.45%)	3,299 (27.48%)
4 - fair	599 (9.19%)	446 (8.13%)	1,045 (8.71%)
5 - poor	147 (2.25%)	105 (1.92%)	252 (2.10%)
Total	6,521 (100%)	5,483 (100%)	12,004 (100%)
Pearson Chi2 df=4	**22.316 p<.001**		

	Gender		
Objective Strain (household income)	Female Frequency(%)	Male Frequency(%)	Total Frequency(%)
1 - > $80,000	287 (6.51%)	345 (8.84%)	641 (7.71%)
2 - $60,000-$79,999	359 (8.14%)	495 (12.68%)	854 (10.27%)
3 - $40,000-$59,999	888 (20.14%)	928 (23.78%)	1,816 (21.85%)
4 - $30,000-$39,999	638 (14.47%)	685 (17.55%)	1,323 (15.91%)
5 - $20,000-$29,999	675 (15.31%)	545 (13.96%)	1,220 (14.68%)
6 - $15,000-$19,999	409 (9.27%)	308 (7.89%)	717 (8.63%)
7 - $10,000-$14,999	498 (11.29%)	281 (7.20%)	779 (9.37%)
8 - $5,000-$9,999	375 (8.50%)	172 (4.41%)	547 (6.58%)
9 - < $5,000	208 (5.07%)	96 (2.46%)	304 (3.66%)
10 - no income	73 (1.66%)	39 (1.00%)	112 (1.35%)
Total	4,410 (100%)	3,903 (100%)	8,313 (100%)
Pearson Chi2 df=9	**216.545 p<.001**		

In terms of health, the pattern is less clear; unexpectedly, women more frequently reported being in excellent or very good health but men were more likely to report being in good health when compared to women. Further, and consistent with predictions, females were more likely than men to report being in fair or poor health.

A very clear and distinct pattern between gender and household income or objective strain was also observed. Males more frequently reported having higher household incomes (less objective strain) than females and conversely, females more frequently reported lower levels of household income (more objective strain). Taking a closer look, it is observed that 62.85% of men reported household incomes of greater than $30,000 while only 49.26% of women fell into this category. On the other hand, 50.74% of women reported household incomes of less than $30,000 while only 37.15% of men fell into this category.

Table 5, presents the results of chi square tests for the independence of GST's conditioning variables and gender to examine whether women tend to score higher on the variables argued to protect against the effects of strain and lower on the variables that are argued to increase the probability of deviant coping; column percentages are displayed for ease of interpretation. The results of all chi square tests are highly significant at $p<.001$ suggesting that gender and GST's conditioning variables are not independent and the column percentages largely support gendered predictions. Contrary to expectations, women tended to report lower levels of social control than men but substantively this only means that fewer women than men were attached to significant others by marriage or common law.

Table - 5 Chi square Tables Testing the Independence of GST's Conditioning Variables and Gender (column percentages displayed)

	Gender		
Social Control (marriage)	Female Frequency(%)	Male Frequency(%)	Total Frequency(%)
0 - currently single	3,176 (48.88%)	2,382 (43.21%)	5,558 (46.27%)
1 - married/common law	3,322 (51.12%)	3,131 (56.79%)	6,453 (53.73%)
Total	6,498 (100%)	5,513 (100%)	12,011 (100%)
Pearson Chi2 df=1	**38.563 p<.001**		
	Gender		
Deviant Peers (alcohol using)	Female Frequency(%)	Male Frequency(%)	Total Frequency(%)
0 - none	687 (10.63%)	328 (6.02%)	1,015 (8.52%)
1 - a few	1,950 (30.18%)	1,057 (19.38%)	3,007 (25.24%)
2 - about half	798 (12.35%)	758 (13.90%)	1,556 (13.06%)
3 - most	2,198 (34.01%)	2,373 (43.52%)	4,571 (38.36%)
4 - all of them	829 (12.83%)	937 (17.18%)	1,766 (14.82%)
Total	6,462 (100%)	5,453 (100%)	11,915 (100%)
Pearson Chi2 df=4	**323.381 p<.001**		
	Gender		
Deviant Peers (Drug using)	Female Frequency(%)	Male Frequency(%)	Total Frequency(%)
0 - none	4,689 (74.44%)	3,312 (62.14%)	8,001 (69.46%)
1 - a few	1,210 (19.21%)	1,375 (25.80%)	2,585 (22.44%)
2 - about half	130 (2.06%)	219 (4.11%)	349 (3.03%)
3 - most	254 (4.03%)	279 (5.23%)	533 (4.63%)
4 - all of them	16 (0.25%)	35 (0.66%)	51 (0.44%)
Total	6,299 (100%)	5,330 (100%)	11,519 (100%)
Pearson Chi2 df=4	**178.965 p<.001**		
	Gender		
Social Support	Female Frequency(%)	Male Frequency(%)	Total Frequency(%)
1 - no family/friends	25 (0.41%)	18 (0.36%)	43 (0.38%)
2 - not helpful	190 (3.08%)	185 (3.69%)	375 (3.36%)
3 - somewhat helpful	438 (7.11%)	436 (8.70%)	874 (7.82%)
4 - helpful	1,017 (16.50%)	1,189 (23.74%)	2,260 (20.23%)
5 - very helpful	4,439 (72.03%)	3,181 (63.51%)	7,620 (68.21%)
total	6,163 (100%)	5,009 (100%)	11,172 (100%)
Pearson Chi2 df=4	**96.89 p<.001**		

Table - 5 Continued. Chi square Tables Testing the Independence of GST's Conditioning Variables and Gender (column percentages displayed)

	Gender		
Religiosity/Spirituality	Female Frequency(%)	Male Frequency(%)	Total Frequency(%)
0- not at all spiritual	1,230 (19.90%)	1,489 (28.81%)	2,719 (23.96%)
1- not very spiritual	1,265 (20.47%)	1,352 (26.15%)	2,617 (23.06%)
2- moderately spiritual	2,926 (47.34%)	1,917 (37.09%)	4,843 (42.59%)
3 - very spiritual	759 (12.28%)	411 (7.95%)	1,170 (10.31%)
Total	6,180 (100%)	5,169 (100%)	11,349 (100%)
Pearson Chi2 df=3	**253.235 p<.001**		

	Gender		
Education	Female Frequency(%)	Male Frequency(%)	Total Frequency(%)
1 – none/elementary	368 (5.89%)	295 (5.63%)	631 (5.50%)
2 - some secondary	1,390 (22.26%)	1,251 (23.89%)	2,641 (23.01%)
3 - secondary	1,555 (24.91%)	1,326 (25.32%)	2,881 (25.10%)
4 - some community college	526 (8.43%)	356 (6.80%)	882 (7.68%)
5 - community college	927 (14.85%)	643 (12.28%)	1,570 (13.68%)
6 - some university	550 (8.81%)	431 (8.23%)	981 (8.54%)
7 - university	763 (12.22%)	686 (13.10%)	1,449 (12.62%)
8 - Masters or PHD	164 (2.63%)	249 (4.75%)	413 (3.60%)
Total	6,243 (100%)	5,237 (100%)	11,480 (100%)
Pearson Chi2 df=8	**67.9403 p<.001**		

Table 6. Gender Differences in the Means of Low Constraint and Deviant Values.

	Mean(S) Males	Mean(S) Females	z-value
Low Constraint	.136 (1.523)	-.111 (1.484)	8.925***
Deviant Values	.337 (1.434)	-.282 (1.358)	24.138***
Significance levels (one-tailed tests)			p<.001*** p<.01** p<.05*

However, as predicted, when compared to men, women reported having fewer drug and alcohol using peers. In terms of alcohol using peers, 40.81% of females reported having a few or no alcohol using peers while only 25.40% of men fell into these categories. On the other hand, 60.70% of men reported that most or all of their friends drank alcohol while only 46.84% of women fell into these categories. The gendered pattern for drug using peers was similar; 74.44% of women compared to 62.14% of men reported having no drug using peers while 37.86% of men compared to 25.56% of women reported having a few or more drug using peers.

The gendered pattern of chi square results for familial and friendship social support was not as obvious; while the differences were very small, women were more likely than men to report having no family and friends and that their family and friends were not helpful with problems. Also unexpectedly, 23.74% of men stated that their friends and family were helpful while only 16.50% of women fell into this category. However, women were much more likely than men to report that their friends and family were very helpful with problems: 72.03% of women versus 63.51% of men. In terms of religiosity/spirituality, the pattern of results was very distinct, indicating that women tended to be more spiritual than men: 59.62% of women compared to 45.04% of men reported being moderately or very spiritual/religious while 54.96% of men compared to 40.38% of women reported being not very or not at all spiritual/religious.

When compared to females, males were more likely to have university and graduate degrees. However, females were more likely than males to have attended some community college and have community college degrees. While the differences were small, females were more likely than males to report having had no schooling/elementary

school attainment while males were more likely to report having some secondary education and completed their secondary education.

Table 6 presents the results of large sample t-tests (see Healey 2009 for formula) to determine whether females tend to score lower than males on measures of deviant values and low constraint. Supporting GST, females tended to be characterized by greater constraint ($z=8.925$, $p<.001$) as well as held fewer deviant values ($z=24.138$, $p<.001$) than males.

In general, the chi square and t-test results are very supportive of predictions about levels of strain and conditioning variables by gender. While females had lower levels of social control (fewer were married or in a common law relationships) they tended to score lower on the conditioning variables that are argued to increase substance use and the probability that strain will lead to substance use: low constraint, deviant peers and deviant values. Females also scored higher on two of the measures that are argued to reduce substance use and protect against the negative effects of strain: social support and spirituality. Taken together, these results imply that while females experience more strain, they may be less likely than males to use drugs and alcohol and less likely to use them to cope with strain.

BIVARIATE RESULTS

Table 7 presents the results of the bivariate analysis of how strain and other theoretically relevant variables individually predict different drinking behaviours. The appropriate type of regression was selected for based on the level of the dependent variable. As previously mentioned, Zero Truncated Negative Binomial regression was

used for binge drinking as it is count data without the possibility of a 0 response and there was evidence of overdispersion, suggesting that NBR is preferred over poisson (Fox 1997, Long 1997). Logistic and Ordinal Logistic Regressions were used on binary variables and ordinal variables respectively. For ease of interpretation, odds ratios and incidence rate ratios are presented as well as the unstandardized coefficients for the relevant regressions.

All variables were significantly associated with drinking frequency with the exception of social support. In terms of the strain variables, high levels of stress were associated with more frequent drinking but negative life experiences (poor health) and objective financial strain were negatively related to drinking frequency. Contrary to predictions, social control and education were positively related to frequent drinking. However, as predicted, low constraint, alcohol using peers and deviant values were all positively and significantly related to alcohol use; individuals scoring higher on these variables reported drinking more often. Spirituality and age were negatively related to the frequency of alcohol use and, males reported drinking more often than females.

All variables were significantly related to drinking to cope in the predicted direction. Lending strong support to the feasibility of using GST to explain alcohol use, individuals who were highly stressed, had health problems and were financially strained were more likely to use alcohol as a coping mechanism. Furthermore, respondents who were high in low constraint, who associated with alcohol using peers and held deviant values were also more likely to use alcohol as a coping mechanism. Males were about 50% more likely than females to drink to cope. Social support, spirituality, education and age were all associated with a reduced likelihood of drinking to cope.

Table 7. Bivariate Analyses of Strain and Theoretically Relevant Variables on Alcohol Use.

	Drinking Frequency	Drinking to Cope	Binge drinking
	ordered logistic regressions	logistic regressions	zero truncated negative binomial regressions
	b [odds ratio] (se)	b [odds ratio] (se)	b [IRR] (se)
Strain Variables			
Subjective Strain (Stress)	.208 [1.231] (.018)***	.347 [1.415] (.040)***	.050 [1.051] (.020)*
Negative Life Experiences (Poor Health)	-.190 [.826] (.017)***	.352 [1.423] (.034)***	.120 [1.127] (.019)***
Objecitve Strain (Household Income)	-.195 [.823] (.009)***	.108 [1.114] (.017)***	.055 [1.057] (.009)***
Conditioning Variables			
Social Control (Marriage)	.076 [1.079] (.033)*	-.643 [.526] (.067)***	-.458 [.632] (.032)***
Low Constraint	.176 [1.190] (.011)***	.202 [1.223] (.022)***	.164 [1.178] (.011)***
Deviant Peers	.854 [2.349] (.016)***	.165 [1.179] (.033)***	.291 [1.337] (.017)***
Deviant Values	.327 [1.387] (.013)***	.127 [1.135] (.023)***	.154 [1.166] (.011)***
Social Support	-.006 [.994] (.022)	-.404 [.668] (.037)***	-.121 [.886] (.021)***
Spirituality	-.389 [.677] (.018)***	-.193 [.825] (.037)***	-.204 [.815] (.018)***
Education	.185 [1.203] (.009)***	-.164 [.849] (.021)***	-.111 [.895] (.009)***
Control Variables			
Gender (Female=0 Male=1)	.912 [2.489] (.034)***	.405 [1.500] (.068)***	.586 [1.796] (.032)***
Age	-.078 [.925] (.005)***	-.102 [.903] (.012)***	-.123 [.884] (.005)***
Significance levels (two tailed test)		p<.001***, p<.01**, p<.05*, p<.10+	

With the exception of the magnitude of the coefficients, the direction and significance of the covariates for binge drinking were identical to those for drinking to cope; coupled with the results on drinking frequency, this indicates that perhaps strain is better at explaining potentially problematic drinking behaviours or coping behaviour rather than the frequency one drinks. Having one drink three or five times a week or even everyday (high scores on the drinking frequency measure) is not necessarily coping behaviour but heavy binge drinking and/or using alcohol as a coping mechanism are behaviours that are more likely to fall into this category.

Table 8 presents the results of the bivariate analysis of how strain and other theoretically relevant variables predict different types of drug use. I will, from now on, be referring to marijuana/hash use as simply marijuana use to facilitate comprehension but the reader is reminded that the measure asked respondents about marijuana or hash use. The bivariate results for using marijuana in the past year and whether or not respondents used marijuana to cope were very similar. With the exception of education, which did not significantly predict marijuana use in the past year, all variables were significant and in the predicted direction. High levels of education did, however, reduce the likelihood of using marijuana as a coping mechanism. Both forms of subjective strain and objective financial strain were positively associated with the likelihood of using marijuana in the past year, and the likelihood that they used the drug to cope with stress. Additionally, as expected, low constraint, drug using peers and deviant values were all positively associated with the likelihood of using marijuana and the likelihood of using marijuana to cope.

Table 8. Bivariate Analyses of Strain and Theoretically Relevant Variables on Drug use.

	Marijuana/Hash Use	Marijuana/Hash to cope	Hard Drug Use	Prescription Drug Use
	logistic regressions b [odds ratio] (se)	logistic regressions b [odds ratio] (se)	logistic regressions b [odds ratio] (se)	logistic regressions b [odds ratio] (se)
Strain Variables				
Subjective Strain (Stress)	.369 [1.447] (.037)***	.612 [1.843] (.091)***	.290 [1.337] (.078)***	.428 [1.534] (.026)***
Negative Experiences (Poor Health)	.075 [1.078] (.032)*	.311 [1.365] (.070)***	.250 [1.284] (.067)***	.327 [1.387] (.023)***
Objecitve Strain (Household Income)	.058 [1.060] (.018)**	.113 [1.119] (.036)**	.020 [1.021] (.046)	.021(.012)+
Conditioning Variables				
Social Control (Marriage)	-1.329 [.265] (.080)***	-1.203 [.300] (.180)***	-1.915 [.147] (.222)***	-.157 [.854] (.046)***
Low Constraint	.238 [1.269] (.021)***	.339 [1.403] (.046)***	.327 [1.386] (.048)***	.107 [1.113] (.015)***
Deviant Peers	1.029 [2.799] (.030)***	1.056 [2.874] (.051)***	1.161 [3.194] (.049)***	.146 [1.157] (.026)***
Deviant Values	.379 [1.461] (.020)***	.260 [1.297] (.040)***	.409 [1.505] (.039)***	-.054 [.947] (.016)***
Social Support	-.250 [.779] (.037)***	-.423 [.655] (.074)***	-.441 [.644] (.069)***	-.071 [.931] (.029)*
Spirituality	-.731 [.481] (.041)***	-.654 [.520] (.092)***	-.776 [.460] (.097)***	.007 [1.007] (.024)
Education	.003 [1.003] (.018)	-.195 [.823] (.042)***	-.136 [.873] (.042)**	-.039 [.962] (.012)**
Control Variables				
Gender (Female=0 Male=1)	.839 [2.313] (.072)***	.589 [1.803] (.161)***	1.119 [3.063] (.175)***	-.314 [.730] (.046)***
Age	-.377 [.686] (.013)***	-.341 [.711] (.030)***	-.503 [.605] (.038)***	.015 [1.015] (.006)*

Significance levels (two tailed test) p<.001***, p<.01**, p<.05*, p<.10+

On the other hand, social control, both forms of social support and age were negatively related to the likelihood of both drug using behaviours. Also, males were more likely than females to use marijuana and to use the drug as a coping mechanism.

With the exception of objective strain, all independent variables were significantly related to hard drug use in the predicted direction. Increased levels of stress and poor health were positively associated with the chances of using one of four hard drugs (speed, LSD, crack/cocaine and heroin) in the past year. Low constraint, associating with drug using peers, holding deviant values and being male were all positively related to the likelihood of using hard drugs. Social control, both forms of social support, education and age were all negatively associated with the likelihood of using hard drugs in past year.

In terms of prescription drug use, the bivariate results are also supportive of GST. Higher levels of stress, poor health and objective financial strain were positively related to the likelihood of using prescription drugs. Low constraint and associating with drug using peers positively related to using prescription drugs but holding deviant values was associated with lower prescription drug use. Gender and spirituality did not significantly predict prescription drug use. Social control, supportive friends and family and education were negatively related to the likelihood of using prescription drugs while age was positively associated with the likelihood of using prescription drugs.

However, because of spuriousness and the potential for confounds, bivariate analysis is inadequate for assessing the individual effects of the explanatory variables. I will now move on to the multivariate results to try and confirm, solidify and expand on the supportive bivariate findings.

MULTIVARIATE RESULTS

Drinking Frequency

Table 9 presents the ordered logistic regression of strain, GST's conditioning variables and controls on drinking frequency in past twelve months. As previously mentioned, ordered logistic regression was chosen over OLS as the dependent variable, drinking frequency, is ordinal in nature (Long, 1997). Like all multivariate results that will be presented, first the regression was run on the full sample and then on males and females separately; z-tests were used to compare male and female coefficients (Paternoster et al. 1998).

In the full sample, high levels of stress were associated with frequent drinking while the other strain measures, poor health and household income, were significantly and negatively related to drinking frequency. Contrary to predictions, respondents in poorer health (high subjective strain) and those with lower household incomes (high objective strain) were less likely to drink alcohol regularly. Being characterized as having low constraint, associating with deviant peers and holding deviant values, were associated with more frequent drinking. For example, for a unit increase in deviant peers, the odds of daily drinking are almost 100% greater, holding all other variables constant. Higher levels of social control and spirituality were associated with less frequent drinking but social support was not significantly related to drinking frequency. Gender, education and age were all significantly and positively related to drinking frequency; males reported drinking more frequently than females and older and more educated people also drank more frequently.

Table 9. Ordered Logistic Regression Estimates of the Effects of Strain and Other Theoretically Relevant Variables on Drinking Frequency in the Past 12 Months (log-odds and odds ratio)

	Full Sample b [odds ratio] (se)	Males b [odds ratio] (se)	Females b [odds ratio] (se)
Strain Variables			
Subjective Strain (Stress)	.068 [1.0171] (.027)*	-.004 [.996] (.039)	.147 [1.158] (.037)***^^
Negative life Experiences (Poor Health)	-.124 [.884] (.025)***	-.073 [.930] (.037)*	-.178 [.837] (.035)***^
Objective Strain (Household Income)	-.120 [.887] (.012)***	-.126 [.881] (.017)***	-.115 [.892] (.017)***
Conditioning Variables			
Social Control (Marriage)	-.171 [.843] (.049)***	-.169 [.844] (.074)*	-.169 [.844] (.069)*
Low Constraint	.126 [1.134] (.015)***	.104 [1.109] (.022)***	.146 [1.157] (.021)***
Deviant Peers	.676 [1.967] (.023)***	.640 [1.896] (.035)***	.711 [2.036] (.031)***
Deviant Values	.250 [1.284] (.019)***	.279 [1.321] (.026)***	.217 [1.242] (.028)***
Social Support	.004 [.996] (.030)	.015 [1.015] (.042)	-.021 [.979] (.043)
Spirituality	-.137 [.872] (.025)***	-.109 [.897] (.036)**	-.169 [.844] (.035)***
Education	.109 [1.115] (.013)***	.067 [1.067] (.018)***	.158 [1.171] (.018)***^^^
Control Variables			
Gender (female=0 male=1)	.637 [1.890] (.048)***	----------	----------
Age	.025 [1.025] (.008)***	.029 [1.029] (.013)*	.027 [1.027] (.011)*
/ cut1	-.006 (.196)	-.520 (.267)	.108 (.279)
/ cut2	1.287 (.197)	.410 (.267)	1.671 (.281)
/ cut3	2.391 (.198)	1.447 (.269)	2.853 (.282)
/ cut4	3.322 (.200)	2.361 (.271)	3.827 (.285)
/ cut5	4.826 (.204)	3.878 (.276)	5.314 (.293)
/ cut6	5.738 (.214)	4.874 (.289)	6.039 (.308)
Log Likelihood	-10700.231	-5362.1828	-5260.8734
Sample Size	6844	3170	3674
Pseudo R square	.111	.074	.117
Significance Levels (two-tailed test)		p<.001***, p<.01**, p<.05*, p<.10+	
Significant Gender Differences (two-tailed test)		p<.001^^^, p<.01^^, p<.05^, p<.10>	

When the sample was disaggregated by gender, some interesting results were observed. Stress was positively associated with drinking frequency for females but not for males. Additionally, the effect of stress on drinking frequency was significantly larger for females, $z=2.809$ $p<.01$, suggesting that stress is particularly important in predicting the drinking behaviour of women. With each unit increase in stress, the odds of daily drinking are increased by about 16% for women but this relationship did not seem to affect men.

In terms of significant predictors and the direction of effects, the remainder of the results are similar to those found in the full sample but there are some additional gender differences in effect sizes. The effect of poor health on drinking frequency was stronger for women and the difference was significant, $z=-2.062$, $p<.05$. Finally, the positive effect of education on drinking frequency was also stronger for women, $z=3.575$, $p<.001$, suggesting that educational attainment may play a more important role in the prediction of female drinking patterns.

Table 10 presents the associations of the interactions between strain and its moderators with drinking frequency in the past twelve months. Like all interactions that will be presented, the interactions were run in full models, which included all the independent variables. The full output, however, will be excluded to conserve space and ease interpretation. While the main effect of objective financial strain on drinking frequency was negative, objective financial strain positively interacted with experiences of stress in the prediction of frequent drinking. Supportive of predictions, at high levels of stress, individuals were more likely to drink frequently when they also reported high levels of objective strain.

Table 10. Ordered Logistic Regression Estimates of the interaction Effects of Strain and Other Theoretically Relevant Variables on Drinking Frequency in the Past 12 Months (models omitted, log-odds).

	Full Sample b(se)	Males b(se)	Females b(se)
Subjective Strain * Objective Strain	.047 (.024)*	.066 (.035)+	.016 (.033)
Negative life Experiences * Objective Strain	-.038 (.023)	-.067 (.036)+	-.000 (.032)
Subjective Strain * Social Control	-.040 (.023)+	-.039 (.035)	-.033 (.033)
Negative Life Experiences * Social Control	.015 (.024)	-.010 (.036)	.028 (.032)
Objective Strain * Social Control	-.040 (.024)	-.142 (.037)***^^^	.035 (.034)
Subjective Strain * Low Constraint	-.007 (.016)	.004 (.021)	-.011 (.024)
Negative Life Experiences * Low Constraint	.021 (.016)	-.008 (.024)	.048 (.023)*>
Objective Strain * Low Constraint	.015 (.016)	.003 (.025)	.026 (.021)
Subjective Strain * Deviant Peers	-.074 (.024)**	-.079 (.038)*	-.043 (.032)
Negative Life Experiences * Deviant Peers	.025 (.025)	.024 (.039)	.018 (.032)
Objective Strain * Deviant Peers	-.007 (.024)	.008 (.039)	-.029 (.033)
Subjective Strain * Deviant Values	.039 (.018)*	.007(.023)	.073 (.027)**>
Negative Life Experiences * Deviant Values	-.011 (.019)	-.031 (.027)	-.015 (.028)
Objective Strain * Deviant Values	-.031 (.018)+	.008 (.027)	-.062 (.027)*
Subjective Strain * Social Support	.023 (.030)	.015 (.043)	.016 (.045)
Negative Life Experiences * Social Support	.016 (.028)	-.009 (.042)	.042 (.039)
Objective Strain * Social Support	-.022 (.027)	-.102 (.039)**^^	.062 (.041)
Subjective Strain * Spirituality	-.019 (.025)	.011 (.032)	-.087 (.031)**^
Negative Life Experiences * Spirituality	-.027 (.022)	.006 (.032)	-.059 (.031)+
Objective Strain * Spirituality	-.012 (.021)	.029 (.032)	.012 (.029)
Subjective Strain * Education	-.028 (.022)	-.045 (.032)	-.020 (.031)
Negative Life Experiences * Education	-.006 (.022)	.020 (.031)	-.007 (.031)
Objective Strain * Education	.012 (.021)	.012 (.031)	-.014 (.029)
Subjective Strain * Age	-.031 (.034)	.028 (.036)	-.038 (.032)
Negative Life Experiences * Age	-.130 (.024)***	-.116 (.035)***	-.144 (.032)***
Objective Strain * Age	-.149 (.024)***	-.148 (.037)***	- .150 (.033)***
Significance levels (two-tailed tests)			p<.001***, p<.01**, p<.05*, p<.10+
Significant Gender Differences (two-tailed tests)			p<.001^^^, p<.01^^, p<.05^, p<.10>

Note: All interaction models were run with the inclusion of all independent variables: subjective strain, negative life experiences, objective strain, social control, low constraint, deviant peers, deviant values, social support, spirituality, education, gender and age.

Several of the conditioning variables significantly interacted with the different types of strain, providing some interesting results. While only marginally significant, social control and subjective strain negatively interacted in the prediction of drinking frequency. High levels of stress were associated with less frequent drinking at high levels of social control. Contrary to expectations, a negative interaction effect between alcohol using peers and subjective strain was reported. This suggests that individuals experiencing high levels of stress were more likely to drink frequently when they had fewer alcohol using peers. A similar interaction was observed between objective strain and deviant values. However, deviant values moderated the relationship between stress and drinking frequency as expected; respondents reporting greater stress, were more likely to drink frequently when they had more deviant values. The only other significant interaction effects reported in the full sample were between age and negative life experiences and age and objective strain. Substantively, poor health and high levels of objective strain were associated with more frequent drinking in younger people.

When the sample was disaggregated by gender, several gender differences were revealed. The interaction between stress and objective strain was associated with male's but not female's drinking frequency. The interaction between negative life experiences and objective strain was also related to drinking frequency for males. Contrary to predictions, the effect was negative suggesting that at low levels of objective strain, negative life experiences were more likely to lead to frequent drinking for males. Neither of these interactions, however, was significantly different than the female interactions.

The interaction between objective strain and social control was highly significant and negatively related to drinking frequency for males. Further, the effect of the

interaction was significantly larger for males than it was for females, $z=-3.582$, $p<.001$. As predicted, social control acted as a protective mechanism against the effects of objective strain but contrary to predictions, the effect of social control on objective strain was stronger for males. Substantively, objective financial strain was less likely to lead to frequent drinking in married men.

Low constraint moderated the relationship between negative life experiences and drinking frequency for females. Females in poor health were more likely to drink frequently when they had low constraint. Contrary to predictions, the effect of the interaction between poor health and low constraint was stronger for females than for males but the difference was only marginally significant, $z=1.685$, $p<.10$. These findings suggest that low constraint may be particularly important in understanding how strains are related to female drinking patterns.

The negative interaction effect between alcohol using peers and subjective strain that was observed in the full sample, only predicted drinking frequency for males but the coefficients did not significantly differ by gender. In contrast, deviant values moderated the relationship between stress and drinking frequency for females only. Females were more likely to drink frequently as a result of high levels of stress when they held greater deviant values. Furthermore, while only marginally significant, the interaction was stronger among females, $z=1.861$ $p<.10$, suggesting that deviant values may be particularly important in conditioning the effects of stress on female drinking behaviour. The negative interaction between deviant values and objective strain was only associated with drinking frequency for females but again, the coefficients did not significantly differ by gender.

The interaction between social support (measured by helpful friends and family) and objective strain became significant when the sample was disaggregated by gender. The interaction for males was negative, indicating that objective strain was less likely to lead to frequent drinking for males with high levels of social support. The gender difference in coefficients was significant, $z=2.898$, $p<.01$, suggesting that for males, social support may be particularly important in moderating the effect of objective strain on drinking patterns. On the other hand, social support, measured by spirituality, seemed to be particularly important in moderating the effects of both types of subjective strain on female drinking patterns. Women were less likely to drink frequently as a result of stress when they reported greater spirituality and the difference in coefficients between males and females was significant, $z=2.120$, $p<.05$. The interaction between spirituality and negative life experiences was also negative for females but only marginally significant; the interaction implies that women in poor health are less likely to drink alcohol frequently when they also report greater spirituality. Coefficient comparison tests demonstrated that this was not significantly different than for males.

Finally, as was observed in the full sample, age negatively and significantly interacted with negative life experiences and objective financial strain in predicting drinking frequency across both the male and female models. Substantively, poor health and high levels of objective strain was associated with more frequent drinking in younger men and women.

Drinking to Cope

Table 11 presents the results of a logistic regression on whether or not respondents had used alcohol as a coping mechanism in the past year. Logistic regression

was chosen in this case as drinking to cope is a binary measure which only varies from 0 to1 (Long 1997). In the full sample, both forms of subjective strain and objective strain were significantly and positively related to drinking to cope (objective strain was only marginally significant). Supporting GST, respondents who experienced high levels of stress, who were in poor health and who were faced with greater financial strain, were more likely to use alcohol as a coping mechanism. For example, with each unit increase in stress, respondents were about 39% more likely to drink to cope. Social control and social support were negatively and significantly related to drinking to cope, suggesting that having helpful friends and family and being married reduced the likelihood of coping through alcohol use. Having many alcohol using peers was associated with a greater likelihood of drinking to cope but deviant values and spirituality were not significantly related to the dependent variable. Males were more likely than females to report that they had drank to cope in the past year. Younger and less educated people were also more likely to report that they used alcohol as a coping mechanism.

When the sample was disaggregated by gender, some notable differences emerged. Objective financial strain was associated with drinking to cope for males but not for females. While only marginally significant, this relationship was statistically different according to the coefficient comparison test, $z=1.65$, $p<.10$; this suggests that objective financial strain may be particularly important to whether men drink to cope. A similar relationship was observed between gender and deviant peers whereby, the positive association of deviant peers with drinking to cope was significantly stronger for men, $z=1.814$, $p<.10$. With each unit increase in deviant peers, the odds of having drank to cope in the past year increased by about 19% for men.

Table 11. Logistic Regression Estimates of the Effects of Strain and Other Theoretically Relevant Variables on Drinking to Cope in the Past 12 Months (log-odds and odds ratio).

	Full Sample b [odds ratio] (se)	Males b [odds ratio] (se)	Females b [odds ratio] (se)
Strain Variables			
Subjective Strain (Stress)	.330 [1.391] (.053)***	.341 [1.406] (.068)***	.317 [1.374] (.085)***
Negative life Experiences (Poor Health)	.222 [1.248] (.046)***	.178 [1.194] (.060)**	.275 [1.316] (.072)***
Objective Strain (Household Income)	.046 [1.047] (.023)*	.075 [1.078] (.030)*	.000 [1.000] (.034)>
Conditioning Variables			
Social Control (Marriage)	-.369 [.691] (.094)***	-.335 [.715] (.127)**	-.481 [.618] (.147)**
Low Constraint	.153 [1.166] (.029)***	.180 [1.197] (.038)***	.126 [1.145] (.046)**
Deviant Peers	.097 [1.101] (.045)*	.171 [1.187] (.061)**	.008 [1.009] (.066)>
Deviant Values	.037 [1.038] (.034)	-.001 [1.000] (.044)	.108 [1.138] (.055)*
Social Support	-.240 [.787] (.049)***	-.193 [.824] (.064)***	-.313 [.789] (.072)***
Spirituality	-.073 [.930] (.050)	-.067 [.935] (.064)	-.083 [.927] (.080)
Education	-.131 [.877] (.028)***	-.144 [.866] (.036)***	-.109 [.815] (.045)**
Control Variables			
Gender (female=1 male=2)	.434 [1.544] (.094)***	----------	----------
Age	-.075 [.927] (.016)***	-.046 [.955] (.022)*	-.115 [.708] (.026)***^
Constant	-2.043 (.370)	-2.174 (.481)	-1.184 (.541)
Log Likelihood	-1783.421	-1009.383	-766.64452
Sample Size	5183	2589	2594
Pseudo R square	.089	.082	.090
Significance Levels (two-tailed test)		p<.001***, p<.01**, p<.05*, p<.10+	
Significant Gender Differences (two-tailed test)		p<.001^^^, p<.01^^, p<.05^, p<.10>	

Deviant values was significantly associated with drinking to cope for females but was not related to the behaviour for males; the difference in coefficients was not statistically significant. Another notable gender difference was reported in the effect of age on drinking to cope. The negative relationship between age and drinking to cope was stronger for women than it was for men, $z=-.2.026$, $p<.05$.

Table 12 presents the associations of the interactions between strain and its moderators with drinking to cope. In the full model, only one interaction effect was significantly associated with drinking to cope and it was in the wrong direction; **w**hile only marginally significant, respondents reporting more health problems, were less likely to drink to cope when they had greater deviant values.

When the sample was disaggregated by gender, none of the interactions were associated with drinking to cope for males. While only marginally significant, social control and stress negatively interacted in the prediction of drinking to cope for females. At high levels of stress, women high in social control were less likely to use alcohol as a coping mechanism. Contrary to predictions but only marginally significant, low constraint and objective strain negatively interacted for females; at high levels of objective strain, females with low constraint were less likely to drink to cope. The negative interaction between deviant peers and negative life experiences was significant in the female sample only. Women in poor health were less likely to cope through the use of alcohol if they had many alcohol using peers; however, the gender difference in coefficients was not significant.

Table 12. Logistic Regression Estimates of the Interaction Effects of Strain and Other Theoretically Relevant Variables on Drinking to Cope in the Past 12 Months (models omitted, log-odds).

	Full Sample b(se)	Males b(se)	Females b(se)
Subjective Strain * Objective Strain	-.001 (.046)	.018 (.060)	-.020 (.074)
Negative Life Experiences * Objective Strain	-.018 (.042)	-.043 (.057)	-.009 (.067)
Subjective Strain * Social Control	-.069 (.047)	-.023 (.060)	-.130 (.078)+
Negative Life Experiences * Social Control	.000 (.044)	-.001 (.056)	.010 (.070)
Objective Strain * Social Control	-.049 (.048)	-.097 (.066)	.016 (.071)
Subjective Strain * Low Constraint	.009 (.032)	-.016 (.041)	.067 (.049)
Negative Life Experiences * Low Constraint	-.006 (.028)	-.045 (.036)	.040 (.044)
Objective Strain * Low Constraint	-.036 (.029)	.005 (.039)	-.078 (.044)+
Subjective Strain * Deviant Peers	.005 (.056)	.047 (.071)	-.023 (.087)
Negative Life Experiences * Deviant Peers	-.079 (.050)	.006 (.067)	-.163 (.074)*
Objective Strain * Deviant Peers	-.035 (.054)	-.058 (.080)	-.017 (.077)
Subjective Strain * Deviant Values	-.001 (.034)	-.011 (.043)	.016 (.061)
Negative Life Experiences * Deviant Values	-.054 (.029)+	-.054 (.040)	-.050 (.045)
Objective Strain * Deviant Values	.005 (.031)	-.054 (.043)	.019 (.049)
Subjective Strain * Social Support	.009 (.048)	.030 (.063)	-.008 (.076)
Negative Life Experiences * Social Support	.045 (.042)	.067 (.057)	.016 (.065)
Objective Strain * Social Support	.008 (.046)	.054 (.063)	-.006 (.070)
Subjective Strain * Spirituality	.069 (.048)	.016 (.061)	.166 (.077)*
Negative Life Experiences * Spirituality	-.008 (.043)	-.002 (.056)	-.040 (.069)
Objective Strain * Spirituality	-.054 (.045)	-.037 (.062)	-.065 (.069)
Subjective Strain * Education	.020 (.058)	.003 (.073)	.023 (.098)
Negative Life Experiences * Education	-.059 (.050)	.030 (.063)	-.183 (.081)*^
Objective Strain * Education	-.025 (.048)	-.002 (.066)	-.067 (.076)
Subjective Strain * Age	.033 (.054)	.095 (.068)	-.018 (.092)
Negative Life Experiences * Age	-.047 (.052)	.012 (.068)	-.128 (.081)
Objective Strain * Age	-.009 (.055)	.007 (.072)	.037 (.087)
Significance levels (two- tailed tests)		p<.001***, p<.01**, p<.05*, p<.10+	
Significant Gender Differences (two- tailed tests)		p<.001^^^, p<.01^^, p<.05^, p<.10>	

Note: All interaction models were run with the inclusion of all independent variables: subjective strain, negative life experiences, objective strain, social control, low constraint, deviant peers, deviant values, social support, spirituality, education, gender and age.

Spirituality positively interacted with stress for females but not for males; women experiencing high levels of stress were more likely to cope with that stress by using alcohol when they identified as being more spiritual. This coefficient, however, was not significantly different from the male coefficient. Education moderated the relationship between negative life experiences and drinking to cope for women only. As predicted, the relationship was negative; women faced with many negative life experiences were less likely to drink to cope if they were also highly educated. Additionally, the gender difference in coefficients was significant, -2.076, $p<.05$, indicating that education may be particularly important in moderating the relationship between negative life experiences and drinking to cope for women.

Binge Drinking

Table 13 presents the results of a Zero Truncated Negative-Binomial Regression on binge drinking in the past twelve months. As previously mentioned, Zero Truncated Negative binomial regression was chosen for binge drinking as it is count data without the possibility of a 0 response. Further, there was evidence of overdispersion as the variable's variance was greater than its mean and the alpha was .403 indicating that NBR is preferred over Poisson (Long 1997).

Surprisingly, in the full sample, stress was only marginally significant in its relation to binge drinking but as expected, negative life experiences and objective financial strain were positively and significantly related to binge drinking. Respondents high in stress, in poor health and those who experienced greater financial strain, on average, reported consuming more alcohol in one sitting.

Table 13. Zero Truncated Negative Binomial Regression Estimates of the Effects of Strain and Other Theoretically Relevant Variables on Binge Drinking in the Past 12 Months (incidence rate ratios presented).

	Full Sample b [IRR] (se)	Males b [IRR] (se)	Females b [IRR] (se)
Strain Variables			
Subjective Strain (Stress)	.039 [1.039] (.020)+	.014 [1.014] (.025)	.086 [1.090] (.030)**>
Negative life Experiences (Poor Health)	.051 [1.053] (.020)**	.045 [1.046] (.027)+	.059 [1.061] (.028)*
Objective Strain (Household Income)	.023 [1.023] (.009)*	.034 [1.035] (.010)**	.005 [1.005] (.013)>
Conditioning Variables			
Social Control (Marriage)	-.170 [.844] (.039)***	-.180 [.835] (.054)***	-.187 [.830] (.053)***
Low Constraint	.116 [1.123] (.012)***	.145 [1.156] (.017)***	.073 [1.076] (.014)***^^^
Deviant Peers	.172 [1.187] (.019)***	.161 [1.175] (.025)***	.177 [1.194] (.028)***
Deviant Values	.055 [1.057] (.013)***	.044 [1.045] (.018)*	.079 [1.081] (.018)***
Social Support	-.041 [.960] (.023)+	-.043 [.958] (.030)	-.038 [.963] (.035)
Spirituality	-.007 [.993] (.019)	.009 [1.009] (.025)	-.031 [.970] (.027)
Education	-.082 [.922] (.009)***	-.082 [.921] (.012)***	-.080 [.923] (.015)***
Control Variables			
Gender (female=1 male=2)	.490 [1.632] (.036)***	----------	----------
Age	-.103 [.902] (.006)***	-.089 [.915] (.009)***	-.119 [.888] (.009)***^
Constant	.884 (.138)	1.312 (.174)	.998 (.206)
Alpha	.403	.465	.260
Log Likelihood	-8791.453	-5013.153	3747.1386
Sample Size	5162	2578	2584
Significance Levels (two-tailed test)			p<.001***, p<.01**, p<.05*, p<.10+
Significant Gender Differences (two-tailed test)			p<.001^^^, p<.01^^, p<.05^, p<.10>

Low constraint, alcohol using peers and deviant values were all positively and significantly related to binge drinking. For example, with each unit increase in negative live experiences, the expected number of drinks consumed increased by about 5%, and with each unit increase in deviant peers, the expected number of drinks consumed increased by approximately 19%, holding all other variables constant. High social control was associated with lower levels of binge drinking but the social support variables were largely unrelated to binge drinking. The relationship between social support and binge drinking was negative but only marginally significant and spirituality was not related to binge drinking. The expected number of drinks was approximately 63% higher for males than for females, holding all other variables constant. Age and education were significantly and negatively related to binge drinking; age and higher levels of education were associated with lower levels of binge drinking.

Supporting what was observed in the drinking frequency results, when the sample was disaggregated by gender, stress became significantly associated with the binge drinking of females but not that of males, and a coefficient comparison test revealed that this difference was marginally statistically significant, $z=1.843$ $p<.10$. On the other hand, while negative life experiences remained significantly associated with binge drinking for both genders, objective financial strain was only related to male binge drinking. Greater financial adversity was associated with higher levels of binge drinking for men. Furthermore, the gender difference in coefficients was marginally significant, $z=1.768$, $p<.10$, indicating that objective financial strains may be particularly important in affecting the binge drinking patterns of men.

In terms of the conditioning variables, social control or being married was associated with lower levels of binge drinking for men and women. Low constraint was related to higher levels of binge drinking for men and for women but the effect of low constraint was stronger for men, $z=3.269$, $p<.001$; low constraint seemed to be of particular importance in the prediction of male binge drinking. For each unit increase in low constraint, the expected number of drinks increased by about 16% for males but by only about 8% for females. Having many alcohol using peers and more deviant values, were related to higher levels of binge drinking for men and for women. Once disaggregated, neither of the social support variables was related to binge drinking

Education and age were negatively and significantly related to binge drinking for males and females but the effect of age was stronger for females, $z=-2.357$, $p<.05$. Younger respondents and those with lower levels of education, reported higher levels of binge drinking but the effects of age on binge drinking was stronger in the female sample.

Table 14 presents the associations of the interactions between strain and its moderators with binge drinking. In the full model, only three interaction effects were significant and two were not in the predicted direction. A negative interaction between deviant values and subjective strain was reported. High levels of stress were associated with less binge drinking in respondents with more deviant values. Also contrary to predictions, a positive interaction was reported between social support and negative life experiences. Respondents in poor health tended to report more binge drinking when they also had access to more social support. However, as hypothesized, a negative interaction effect between education and negative life experiences was observed. Poor health was associated with less binge drinking in well educated respondents.

Several gender differences were observed when the sample was disaggregated by gender. A positive but marginally significant interaction between objective financial strain and stress was observed in the female sample only. As expected, at high levels of objective strain, the subjective experience of stress was associated with higher levels of binge drinking. In contrast, a negative and significant interaction between negative life experiences and objective strain was observed in the male sample only. Contrary to predictions, at higher levels of objective strain, negative life experiences or poor health was related to lower levels of binge drinking. These interactions however, were not significantly different according to coefficient comparison tests.

Low constraint moderated the relationship between negative life experiences and binge drinking for females. As expected, the relationship was positive; women in poor health tended to report higher levels of binge drinking when they also had low constraint. Further, there was a significant gender difference in coefficients, $z=1.744$ $p<.10$, suggesting that low constraint may play an important role in moderating the effects of negative life experiences on binge drinking.

The negative interaction effect between deviant values and subjective strain, observed in the full sample, was only related to the binge drinking of males. However, this interaction was not statistically different from the coefficient in the female model. The positive interaction reported between social support and negative life experiences in the full sample, was also only related to the binge drinking of males.

Table 14. Zero Truncated Negative Binomial Regression Estimates of the Interaction Effects of Strain and Other Theoretically Relevant Variables on Binge Drinking in the Past 12 Months (Models Omitted).

	Full Sample b(se)	Males b(se)	Females b(se)
Subjective Strain * Objective Strain	.023 (.020)	.008 (.026)	.047 (.029)+
Negative Life Experiences * Objective Strain	.027 (.019)	-.058 (.024)*	.033 (.030)
Subjective Strain * Social Control	-.011 (.018)	-.001 (.024)	-.016 (.025)
Negative Life Experiences * Social Control	-.020 (.018)	-.038 (.025)	.004 (.026)
Objective Strain * Social Control	-.016 (.020)	.003 (.027)	-.024 (.030)
Subjective Strain * Low Constraint	.006 (.012)	.002 (.016)	.001 (.016)
Negative Life Experiences * Low Constraint	.019 (.013)	.005 (.018)	.047 (.016)**>
Objective Strain * Low Constraint	.009 (.012)	.018 (.017)	.004 (.016)
Subjective Strain * Deviant Peers	-.017 (.027)	-.002 (.031)	-.043 (.039)
Negative Life Experiences * Deviant Peers	.005 (.022)	-.020 (.029)	.037 (.032)
Objective Strain * Deviant Peers	-.008 (.026)	.012 (.033)	-.020 (.039)
Subjective Strain * Deviant Values	-.033 (.012)**	-.037 (.017)*	-.007 (.017)
Negative Life Experiences * Deviant Values	-.022 (.013)	-.025 (.020)	-.017 (.018)
Objective Strain * Deviant Values	.020 (.013)	.013 (.018)	.013 (.017)
Subjective Strain * Social Support	.011 (.023)	.004 (.027)	.015 (.040)
Negative Life Experiences * Social Support	.039 (.020)+	.072 (.027)**	-.018 (.028)^
Objective Strain * Social Support	.014 (.024)	.062 (.026)*	-.037 (.038)^
Subjective Strain * Spirituality	-.003 (.018)	-.018 (.023)	.021 (.027)
Negative Life Experiences * Spirituality	-.004 (.019)	-.013 (.026)	.003 (.026)
Objective Strain * Spirituality	.010 (.018)	.026(.026)	.001 (.026)
Subjective Strain * Education	-.008 (.021)	.024 (.025)	-.073 (.033)*^
Negative Life Experiences * Education	-.039 (.019)*	-.050 (.023)*	-.016 (.031)
Objective Strain * Education	.002 (.019)	.005 (.026)	.000 (.029)
Subjective Strain * Age	-.001 (.021)	.012 (.028)	.012 (.030)
Negative Life Experiences * Age	-.002 (.021)	-.022 (.017)	.016 (.031)
Objective Strain * Age	.020 (.022)	.035 (.027)	.017 (.037)
Significance levels (two-tailed tests)		p<.001***, p<.01**, p<.05*, p<.10+	
Significant Gender Differences (two-tailed tests)		p<.001^^^, p<.01^^, p<.05^, p<.10>	

Note: All interaction models were run with the inclusion of all independent variables: subjective strain, negative life experiences, objective strain, social control, low constraint, deviant peers, deviant values, social support, spirituality, education, gender and age.

Poor health was associated with higher levels of binge drinking for males with more social support; the gender difference in coefficients was significant, $z=2.314$ $p<.05$, indicating that this effect is significantly stronger for men than for women. A similar interaction was observed for males between social support and objective financial strain. Low income was associated with higher levels of binge drinking for males with more social support; the gender difference in coefficients was significant, $z=2.150$, $p<.05$, indicating that this effect is also stronger for men. Taken together these finding suggest for men, social support may actually encourage binge drinking as a method of coping with strain.

A negative interaction effect between education and subjective strain was reported for women only. Women reporting high levels of stress tended to report lower levels of binge drinking when they were highly educated; this effect was significantly stronger for women, $z=2.343$ $p<.05$. A negative interaction effect between education and negative life experiences was observed in the male model only. Poor health was associated with higher levels of binge drinking for males with lower levels of education. Coefficient comparison tests suggested that this interaction was not significantly different across gender.

Marijuana/Hash Use

Table 15 presents the results of a logistic regression on whether or not respondents had used marijuana or hash in past twelve months. In the full sample, stress was the only strain variable significantly related to marijuana use. Respondents experiencing higher levels of stress were more likely to have used marijuana. More specifically, with each increase in stress levels, the odds of having used marijuana in the past year increased by about 27%. All of the conditioning variables were significantly

related to marijuana use in the predicted direction. Individuals characterized by low constraint, those with more drug using peers and greater deviant values were more likely to have used marijuana. On the other hand, individuals scoring high on measures of social control, social support and spirituality were less likely to have used marijuana. Males were more likely to have used marijuana than females. Education was positively related to marijuana use while age was negatively related to it. Respondents higher in educational attainment were more likely to have used marijuana; younger individuals were also more likely to have used it. Social control and deviant peers seemed to have particularly strong relationships with marijuana use; respondents who reported being married or in a common law relationship were about 50% less likely to have used marijuana, and with each unit increase in deviant peers, respondents were about 130% more likely to have used marijuana.

When the sample was disaggregated by gender, stress was only marginally associated with marijuana use for males but significantly and positively associated with female's marijuana use. Furthermore, the association of stress with marijuana use was significantly stronger for women, $z= 2.103$, $p<.05$, suggesting that stress may be particularly relevant to the prediction of women's marijuana use. With each unit increase in stress, the odds of having used marijuana in the past year increased by about 51% for women but only by about 16% for men, holding all other variables constant. While only marginally significant, objective strain was negatively related to marijuana use for males but the gender difference in coefficients was not significant.

Table 15. Logistic Regression Estimates of the Effects of Strain and Other Theoretically Relevant Variables on Marijuana Use in the Past 12 Months (log-odds and odds ratio).

	Full Sample b [odds ratio] (se)	Males b [odds ratio] (se)	Females b [odds ratio] (se)
Strain Variables			
Subjective Strain (Stress)	.237 [1.267] (.062)***	.144 [1.155] (.078)+	.414 [1.512] (.102)***^
Negative life Experiences (Poor Health)	.074 [1.077] (.059)	.107 [1.113] (.075)	.021 [1.021] (.100)
Objective Strain (Household Income)	-.025 [.975] (.026)	-.065 [.937] (.035)+	.020 [1.020] (.039)
Conditioning Variables			
Social Control (Marriage)	-.700 [.497] (.116)***	-.772 [.462] (.150)***	-.700 [.513] (.194)***
Low Constraint	.223 [1.250] (.036)***	.246 [1.278] (.047)***	.183 [1.201] (.056)***
Deviant Peers	.866 [2.377] (.052)***	1.016 [2.761] (.070)***	.656 [1.927] (.087)***^^
Deviant Values	.319 [1.377] (.041)***	.302 [1.352] (.054)***	.355 [1.426] (.062)***
Social Support	-.180 [.836] (.060)**	-.152 [.859] (.078)+	-.223 [.800] (.092)+
Spirituality	-.314 [.731] (.060)***	-.154 [.857] (.078)*	-.550 [.577] (.098)***^^
Education	.066 [1.068] (.030)*	.092 [1.097] (.039)*	.026 [1.027] (.048)
Control Variables			
Gender (female=1 male=2)	.520 [1.682] (.113)***	----------	----------
Age	-.303 [.739] (.023)***	-.281 [.755] (.031)***	-.352 [.703] (.037)***
Constant	2.800 (.250)	1.272 (.489)	1.216 (.622)
Log Likelihood	-1293.2745	-764.15294	-512.62918
Sample Size	6737	3099	3638
Pseudo R square	.310	.306	.293
Significance Levels (two-tailed test)		p<.001***, p<.01**, p<.05*, p<.10+	
Significant Gender Differences (two-tailed test)		p<.001^^^, p<.01^^, p<.05^, p<.10>	

With the exception of education in the female sample, all conditioning variables were significantly related to marijuana use, in the predicted direction, for both genders. However, the positive effect of deviant peers on marijuana use was stronger for males, $z=3.224$, $p<.01$, suggesting that having many drug using peers may more important in relating to men's marijuana use. With each unit increase in deviant peers, the odds of having used marijuana in the past year increased by about 176% for men but only by about 93% for women, holding all other variables constant. Another important gender difference was reported in the negative relationship of spirituality with marijuana use, which was stronger for females, $z=-3.162$, $p<.01$. High levels of spirituality had a stronger negative association with the likelihood that women would use marijuana. Education did not predict female marijuana use but was positively related to male marijuana use; with more education men reported more marijuana use. Coefficient comparison tests revealed that this was not a statistically significant difference. Finally, younger males and females were more likely to have used marijuana.

Table 16 presents the association of the interactions between strain and its moderators with the likelihood of having used marijuana or hash in the past twelve months. In the full sample, three interaction relationships were observed but they were not in the predicted direction. High levels of objective strain were associated with a lower likelihood of marijuana use at high levels of drug using peers, and respondents in poor health were more likely to use marijuana when they also reported being more spiritual and having more social support. Further, younger respondents in poor health were more likely to use marijuana than older respondents in poor health.

Table 16. Logistic Regression Estimates of the Effects of Strain and Other Theoretically Relevant Variables on Marijuana Use in the Past 12 Months (Models Omitted, Log-Odds).

	Full Sample b(se)	Males b(se)	Females b(se)
Subjective Strain * Objective Strain	.027 (.053)	.151 (.079)*^^	-.198 (.079)*
Negative Life Experiences * Objective Strain	-.040 (.057)	-.023 (.070)	-.047 (.095)
Subjective Strain * Social Control	-.057 (.057)	-.084 (.071)	-.015 (.096)
Negative Life Experiences * Social Control	-.003 (.058)	-.087 (.071)	.171 (.103)+
Objective Strain * Social Control	.065 (.056)	.120 (.073)	.007 (.091)
Subjective Strain * Low Constraint	-.051 (.036)	-.067 (.046)	-.012 (.058)
Negative Life Experiences * Low Constraint	-.058 (.037)	-.115 (.047)*	.038 (.068)
Objective Strain * Low Constraint	.043 (.033)	.029 (.044)	.093 (.054)+
Subjective Strain * Deviant Peers	.062 (.042)	.138 (.052)*	.015 (.077)
Negative Life Experiences * Deviant Peers	.045 (.044)	.090 (.052)+	-.045 (.082)
Objective Strain * Deviant Peers	-.097 (.042)*	-.073 (.053)	-.066 (.070)
Subjective Strain * Deviant Values	.052 (.039)	.028 (.053)	.140 (.060)*
Negative Life Experiences * Deviant Values	-.048 (.038)	-.083 (.053)	.002 (.057)
Objective Strain * Deviant Values	-.044 (.041)	-.035 (.056)	-.034 (.057)
Subjective Strain * Social Support	-.029 (.059)	.001 (.071)	-.099 (.100)
Negative Life Experiences * Social Support	.109 (.054)*	.134 (.068)*	-.020 (.088)
Objective Strain * Social Support	.033 (.057)	.036 (.077)	.073 (.087)
Subjective Strain * Spirituality	.010 (.059)	-.015 (.070)	.137 (.112)
Negative Life Experiences * Spirituality	.097 (.057)+	.035 (.073)	.165 (.100)+
Objective Strain * Spirituality	.085 (.054)	.106 (.072)	.149 (.084)+
Subjective Strain * Education	-.030 (.057)	-.023 (.069)	-.032 (.096)
Negative Life Experiences * Education	-.002 (.057)	.007 (.070)	-.007 (.100)
Objective Strain * Education	-.036 (.053)	.036 (.069)	-.117 (.088)
Subjective Strain * Age	-.080 (.072)	-.135 (.089)	.116 (.126)
Negative Life Experiences * Age	-.295 (.080)***	-.373 (.099)***	-.243 (.144)+
Objective Strain * Age	.050 (.071)	.181 (.088)*	.071 (.123)
Significance levels (two tailed tests)		p<.001***, p<.01**, p<.05*, p<.10+	
Significant Gender Differences (two tailed tests)		p<.001^^^, p<.01^^, p<.05^, p<.10>	

Note: All interaction models were run with the inclusion of all independent variables: subjective strain, negative life experiences, objective strain, social control, low constraint, deviant peers, deviant values, social support, spirituality, education, gender and age.

The interaction between subjective and objective strain was not significant in the full sample but when the sample was disaggregated by gender, a marginally significant and positive interaction effect was revealed for males and a significant negative effect for females. The gender difference in the coefficients was significant, $z=3.124$, $p<.01$. This finding demonstrates that at high levels of subjective strain, men were more likely to report marijuana use if they also reported high levels of objective strain. In contrast, women with high levels stress were less likely to report marijuana use when they also reported high levels of objective strain. These findings suggests that perhaps men are more likely than women to interpret their objective financial circumstances as stressful, encouraging the use of marijuana as a method to cope with the resultant stress.

A negative relationship between low constraint and negative life experiences was associated with male marijuana use only. Unexpectedly, men in poor health were less likely to report marijuana use when they also reported low constraint. While only marginally significant, low constraint and objective financial strain positively interacted in the female model. Women with high levels of objective strain were more likely to report marijuana use when they also had low constraint. Deviant peers and both types of subjective strain interacted and were positively associated with marijuana use in the male model. As expected, males in poor health and those experiencing high levels of stress were more likely to report marijuana use when they had many drug using peers. In accordance with the main effect findings, drug using peers seemed to be particularly important in associating with male marijuana use. In the female model the interaction between deviant values and subjective strain was positively related to marijuana use. Women reporting high levels of stress were more likely to report marijuana use when

they had more deviant values. Nevertheless, none of these interactions differed by gender when subjected to coefficient comparison tests.

The positive interaction between social support and negative life experiences observed in the full model was only significantly related to male marijuana use. While the effects were only marginally significant, spirituality moderated the relationship between strain and substance use for females. High levels of negative life experiences and objective financial strain were more likely to lead to marijuana use for more spiritual females. A negative interaction effect between age and negative life experiences was observed in the male and female models. While the relationship was only marginally significant for females, this finding implies that health problems have a positive relationships with marijuana use for younger people. Finally, in the male model, the interaction between objective strain and age was positively associated with marijuana use, suggesting that older men with objective strain are more likely to report marijuana use than younger men experiencing the same levels of objective financial strain. Again none of these interactions were significantly different across gender.

Using Marijuana to Cope

Table 17 presents the results of a logistic regression on whether or not respondents had used marijuana or hash in past twelve months to cope with stress. In the full sample, high levels of stress were positively associated the likelihood that respondents had used marijuana to cope. More specifically, with each unit increase in stress, the odds of having used marijuana to cope in the past year increased by about 73%. The positive relationship between negative life experiences and using marijuana to

cope was marginally significant; individuals in poorer health were more likely to cope by using marijuana. Objective strain was not related to using marijuana to cope.

Four of the conditioning variables were significantly associated with using marijuana to cope; as expected, being married and highly educated were negatively related to the likelihood of coping through marijuana use while low constraint and deviant peers were positively related to the likelihood of this coping behaviour. For example, with each unit increase in deviant peers the odds of having used marijuana to cope were about 165% greater, holding all other variables constant. Gender was not significantly associated to using marijuana to cope but age was negatively and significantly related to it.

When the sample was disaggregated by gender some interesting patterns were revealed. Stress maintained its significant and positive relationship with using marijuana to cope across both genders, but poor health only became significant in predicting men's coping behaviour. The positive association of poor health with using marijuana to cope was stronger for males but the difference was only marginally significant, $z=1.714$, $p<.10$. Poor health seemed to be particularly relevant to the greater use of marijuana to cope by men. In this case, objective strain did not predict the coping behaviour of either gender.

While the relationship was only marginally significant, high social control or being married was negatively associated with using marijuana to cope for men but was not related to women's coping behaviour; however, this was not a statistically significant difference according to coefficient comparison tests. Low constraint was positively related to using marijuana to cope for women but surprisingly, not for men.

Table 17. Logistic Regression Estimates of the Effects of Strain and Other Theoretically Relevant Variables on Using Marijuana to cope in the Past 12 Months (log-odds and odds ratio).

	Full Sample b [odds ratio] (se)	Males b [odds ratio] (se)	Females b [odds ratio] (se)
Strain Variables			
Subjective Strain (Stress)	.549 [1.732] (.129)***	.576 [1.779] (.182)**	.607 [1.834] (.185)***
Negative life Experiences (Poor Health)	.154 [1.166] (.115)+	.330 [1.391] (.151)*	-.056 [.945] (.167)>
Objective Strain (Household Income)	.048 [1.049] (.047)	-.006 [1.006] (.066)	.086 [1.089] (.067)
Conditioning Variables			
Social Control (Marriage)	-.406 [.666] (.245)+	-.567 [.567] (.345)+	-.351 [.704] (.358)
Low Constraint	.226 [1.253] (.070)**	.122 [1.130] (.096)	.363 [1.437] (.099)***>
Deviant Peers	.975 [2.651] (.089)***	1.223 [3.397] (.122)***	.685 [1.983] (.144)***^^
Deviant Values	.085 [1.089] (.080)	-.016 [.984] (.101)	.278 [1.321] (.124)*>
Social Support	-.238 [.789] (.116)*	-.045 [.957] (.182)	-.457 [.633] (.147)**>
Spirituality	-.198 [.820] (.123)	-.136 [.873] (.176)	-.263 [.769] (.182)
Education	-.188 [.828] (.064)**	-.217 [.805] (.084)**	-.128 [.880] (.097)
Control Variables			
Gender (female=1 male=2)	.182 [1.200] (.239)	----------	----------
Age	-.237 [.789] (.041)***	-.201 [.818] (.056)***	-.311 [.733] (.066)***
Constant	-4.369 (.867)	-5.529 (1.234)	-3.093 (1.068)
Log Likelihood	-380.93965	-200.2917	-169.75395
Sample Size	6735	3097	3638
Pseudo R square	.291	.332	.273
Significance Levels (two-tailed test)		p<.001***, p<.01**, p<.05*, p<.10+	
Significant Gender Differences (two-tailed test)		p<.001^^^, p<.01^^, p<.05^, p<.10>	

Females characterized by low constraint were more likely to have used marijuana to cope; the gender difference in coefficients was marginally significant, suggesting that the effect was stronger in women than in men, $z=1.747$, $p<.10$. Low constraint may be particularly important to using marijuana to cope for females. Deviant peers was positively associated with the likelihood of coping with marijuana in both genders but the effect was significantly stronger for men, $z=2.851$, $p<.01$; indicating that drugs using peers may be more important to whether males choose to use marijuana as a coping mechanism. With each unit increase in deviant peers, the odds of having used marijuana to cope in the past year increased by about 240% for men but only by about 98% for women, holding all other variables constant.

Deviant values and social support were not related to men's coping behaviour but both were related to the behaviour of females. Deviant values was positively associated with the likelihood of coping with marijuana for females and the effect was stronger than it was for males, $z=1.838$, $p<.10$; suggesting that deviant values may be particularly relevant to whether females will use marijuana to cope. Social support was negatively associated with the likelihood of coping with marijuana for females and the effect was slightly stronger than for males, $z=-1.761$, $p<.10$; indicating that helpful friends and family may be particularly important to whether women will cope through marijuana use. Holding all other variable constant, with each unit increase in social support, the odds of having used marijuana to cope in the past year were about 37% lower for women but in this case, social support was not significantly associated with men's marijuana use.

Table 18. Logistic Regression Estimates of the Effects of Strain and Other Theoretically Relevant Variables on Using Marijuana to Cope in the Past 12 Months (Models Omitted, Log-Odds).

	Full Sample b(se)	Males b(se)	Females b(se)
Subjective Strain * Objective Strain	.238 (.112)*	.319 (.159)*	.191 (.156)
Negative Life Experiences * Objective Strain	-.084 (.102)	-.071 (.129)	-.057 (.161)
Subjective Strain * Social Control	-.312 (.121)**	-.302 (.175)+	-.368 (.168)*
Negative Life Experiences * Social Control	-.151 (.115)	-.235 (.149)	-.092 (.193)
Objective Strain * Social Control	-.015 (.116)	-.034 (.166)	-.043 (.161)
Subjective Strain * Low Constraint	-.027 (.080)	-.038 (.108)	-.052 (.120)
Negative Life Experiences * Low Constraint	-.018 (.063)	-.007 (.087)	.108 (.093)
Objective Strain * Low Constraint	.156 (.063)*	.107 (.086)	.197 (.093)*
Subjective Strain * Deviant Peers	-.010 (.071)	.080 (.113)	-.045 (.099)
Negative Life Experiences * Deviant Peers	.068 (.077)	.104 (.105)	-.046 (.100)
Objective Strain * Deviant Peers	-.074 (.064)	-.100 (.083)	.054 (.086)
Subjective Strain * Deviant Values	.011 (.065)	-.021 (.097)	.073 (.105)
Negative Life Experiences * Deviant Values	-.010 (.073)	-.012 (.096)	-.036 (.114)
Objective Strain * Deviant Values	.013 (.066)	.043 (.091)	-.024 (.100)
Subjective Strain * Social Support	-.053 (.117)	-.086 (.200)	-.001 (.137)
Negative Life Experiences * Social Support	.098 (.109)	-.007 (.173)	.085 (.145)
Objective Strain * Social Support	.002 (.095)	.183 (.139)	-.067 (.107)
Subjective Strain * Spirituality	.064 (.123)	.064 (.177)	.015 (.191)
Negative Life Experiences * Spirituality	.071 (.105)	.038 (.148)	.082 (.164)
Objective Strain * Spirituality	-.029 (.107)	.062 (.161)	-.136 (.137)
Subjective Strain * Education	-.130 (.137)	.044 (.174)	-.381 (.193)*
Negative Life Experiences * Education	-.231 (.119)+	-.203 (.157)	-.302 (.175)+
Objective Strain * Education	.066 (.117)	.229 (.148)	-.140 (.183)
Subjective Strain * Age	-.059 (.124)	-.046 (.160)	-.136 (.217)
Negative Life Experiences * Age	-.208 (.135)	-.301 (.169)+	-.144 (.220)
Objective Strain * Age	.166 (.127)	.193 (.179)	.170 (.199)
Significance levels (two-tailed tests)		p<.001***, p<.01**, p<.05*, p<.10+	
Significant Gender Differences (two-tailed tests)		p<.001^^^, p<.01^^, p<.05^, p<.10>	

Note: All interaction models were run with the inclusion of all independent variables: subjective strain, negative life experiences, objective strain, social control, low constraint, deviant peers, deviant values, social support, spirituality, education, gender and age.

Education was negatively and significantly related to using marijuana to cope in the male model only. Males with higher levels of education were less likely to use marijuana as a coping mechanism. This coefficient was not, however, significantly different from the female coefficient. Age was negatively and significantly related to using marijuana to cope across both genders. Younger respondents were more likely to cope through the use of marijuana.

Table 18 presents the association of the interactions between strain and its moderators on the likelihood of using marijuana or hash to cope. Only a few of the interactions tested were significant in the full model. As predicted, subjective and objective strains positively interacted; respondents experiencing high levels of stress were more likely to use marijuana to cope if they also reported high levels of objective strain. As expected, social control and subjective strain negatively interacted in their association with using marijuana to cope; high stress levels were associated with a lower likelihood of using marijuana to cope for married or common law respondents. Low constraint moderated the effect of objective strain on using marijuana; the effect was positive, indicating that respondents high in objective financial strain were more likely to use marijuana to cope if they also had low constraint. Finally, a marginally significant interaction between education and negative life experiences was observed. The relationship was negative, suggesting that respondents in poor health were less likely to use marijuana to cope if they were well educated.

While there were some gender differences in the significance of relationships, there were no significant gender differences in coefficients. Subjective and objective strain positively interacted in the full model but once the sample was disaggregated by

gender, the effect only remained significant in the male model. The effect of social control on the relationship between stress and using marijuana to cope remained significant in the male and female models. However, low constraint only moderated the effect of objective strain on using marijuana to cope in the female model. The effect remained positive; females high in objective strain were more likely to cope through marijuana use when they also had low constraint. The interaction between age and negative life experiences became marginally significant in the male model. Poor health was more likely to lead to coping through marijuana use in younger males. In the female model, education moderated the relationships between subjective strain, negative life experiences and using marijuana to cope. Women reporting high levels of stress and poor health were less likely to cope by using marijuana if they were highly educated. In all the above cases, none of these interactions proved to be significantly different across gender.

Hard Drug use

Table 19 presents the results of a logistic regression on the likelihood of using one to four hard drug types: cocaine/crack, speed, LSD or heroin. In the full sample, stress was positively related to the likelihood of hard drug use while objective strain was negatively related to it; the relationships were only marginally significant. As predicted, respondents reporting high levels of stress were more likely to use hard drugs but contrary to hypotheses, respondents experiencing higher levels of objective financial strain were less likely to use hard drugs. With each unit increase in stress, the odds of using hard drugs increased by about 26%, holding all other variable constant.

Table 19. Logistic Regression Estimates of the Effects of Strain and Other Theoretically Relevant Variables on Hard Drug use in the Past 12 Months (log-odds and odds ratio).

	Full Sample b [odds ratio] (se)	Males b [odds ratio] (se)	Females b [odds ratio] (se)
Strain Variables			
Subjective Strain (Stress)	.230 [1.259] (.127)+	.252 [1.287] (.141)+	.175 [1.191] (.270)
Negative life Experiences (Poor Health)	.152 [1.165] (.117)	.245 [1.278] (.141)+	-.187 [.830] (.230)
Objective Strain (Household Income)	-.093 [.911] (.056)+	-.139 [.870] (.067)*	-.028 [1.028] (.109)
Conditioning Variables			
Social Control (Marriage)	-948 [.388] (.282)***	-.879 [.415] (.319)**	-1.367 [.255] (.671)*
Low Constraint	.310 [1.363] (.076)***	.301 [1.351] (.091)***	.382 [1.466] (.139)**
Deviant Peers	.914 [2.495] (.097)***	.963 [2.619] (.117)***	.869 [2.386] (.215)***
Deviant Values	.150 [1.162] (.080)+	.102 [1.107] (.094)	.327 [1.388] (.141)*
Social Support	-.265 [.768] (.122)*	-.336 [.715] (.151)*	-.059 [.943] (.212)
Spirituality	-.186 [.831] (.144)	-.195 [.823] (.177)	-.164 [.849] (.233)
Education	.028 [.972] (.072)	.009 [.991] (.086)	-.099 [.906] (.121)
Control Variables			
Gender (female=1 male=2)	.783 [2.189] (.272)**	----------	----------
Age	-.344 [.709] (.062)***	-.289 [.749] (.073)***	-.501 [.582] (.119)***
Constant	-3.121 (.807)	-2.568 (.938)	-2.457 (1.388)
Log Likelihood	-336.62424	-232.14673	-97.402137
Sample Size	6733	3098	3635
Pseudo R square	.326	.305	.348
Significance Levels (two-tailed test)		p<.001***, p<.01**, p<.05*, p<.10+	
Significant Gender Differences (two-tailed test)		p<.001^^^, p<.01^^, p<.05^, p<.10>	

With the exception of spirituality and education, all conditioning variables were significantly related to hard drug use in the predicted direction. In terms of social control, being married or in a common law relationship was negatively associated with the likelihood of hard drug use. More specifically, respondents who reported being married or in a common law relationship were approximately 61% less likely than those who were single to report using hard drugs, holding all other variables constant. Having higher levels of social support also reduced the likelihood of using hard drugs. Individuals characterized by a higher degree of low constraint, those who associated with a greater amount of drug using peers and those who held greater deviant values were more likely to have used hard drugs. For example, the odds of using hard drugs were about 150% greater for each unit increase in deviant peers, holding all other variables constant. Males were significantly more likely to use hard drugs than their female counterparts. Education was not related to hard drug use but age was negatively related to it. Younger people were more likely to use hard drugs.

When the sample was disaggregated by gender, none of the strain variables were related to women's hard drug use but subjective strain, negative life experiences and objective strain were all significantly related to men's hard drug use. High levels of stress and negative life experiences were positively associated with hard drug use for males while objective strain was negatively associated with hard drug use.

In terms of the conditioning variables, the same results were reported as in the full sample with the exception of deviant values and social support. Deviant values was positively associated with the hard drug use of women; women who held greater deviant values were more likely to have used hard drugs. Social support was negatively related to

men's hard drug use, suggesting that helpful friends and family were associated with a lower likelihood of hard drug use. Education was not related to either gender's hard drug use but younger men and women were more likely to use hard drugs. Overall, there were no significant gender differences in the coefficients reported.

Table 20 presents the association of the interactions between strain and its moderators with the likelihood of hard drug use. Only two of the twenty-six interactions tested significantly associated with hard drug use in the full model. Contrary to predictions, a negative and significant interaction between deviant peers and objective strain, and a positive and significant interaction between negative life experiences and social support were associated with hard drug use. Poor health and high levels of objective strain were associated with an increased likelihood of hard drug use at low levels of deviant peers and high levels of social support.

When the sample was disaggregated by gender, only the interaction between negative life experiences and social support was related to male hard drug use. Contrary to predictions, men in poor health were more likely to use hard drugs when they had more social support; this relationship was not related to female hard drug use, however, and this interaction was not statistically different across gender.

In the female model, low constraint moderated the relationship between objective strain and hard drug use. At high levels of objective strain, women with low constraint were more likely use hard drugs. The relationship was positive and marginally significantly stronger for women, $z=1.934$, $p<.10$, suggesting that low constraint may be particularly important in moderating the effect of objective strain on hard drug use for women.

Table 20. Logistic Regression Estimates of the Effects of Strain and Other Theoretically Relevant Variables on Hard Drug Use in the Past 12 Months (Models Omitted, Log-Odds).

	Full Sample b(se)	Males b(se)	Females b(se)
Subjective Strain * Objective Strain	.031 (.115)	.164 (.117)	-.205 (.214)
Negative Life Experiences * Objective Strain	.002 (.104)	.031 (.122)	.162 (.214)
Subjective Strain * Social Control	-.021 (.128)	.058 (.136)	-.370 (.331)
Negative Life Experiences * Social Control	-.156 (.127)	-.185 (.132)	-.322 (.529)
Objective Strain * Social Control	.039 (.147)	.077 (.178)	.020 (.269)
Subjective Strain * Low Constraint	-.003 (.068)	.005 (.079)	-.058 (.135)
Negative Life Experiences * Low Constraint	-.006 (.067)	-.039 (.082)	.086 (.128)
Objective Strain * Low Constraint	.086 (.072)	.016 (.087)	.298 (.117)*>
Subjective Strain * Deviant Peers	-.060 (.162)	.085 (.087)	-.232 (.113)*
Negative Life Experiences * Deviant Peers	-.160 (.149)	-.050 (.092)	-.507 (.117)***^^
Objective Strain * Deviant Peers	-.287 (.135)*	-.005 (.096)	-.012 (.115)
Subjective Strain * Deviant Values	.049 (.078)	.011 (.101)	.181 (.162)
Negative Life Experiences * Deviant Values	-.046 (.066)	-.078 (.078)	-.043 (.146)
Objective Strain * Deviant Values	.051 (.063)	.068 (.085)	.160 (.136)
Subjective Strain * Social Support	.079 (.095)	.127 (.114)	.037 (.179)
Negative Life Experiences * Social Support	.237 (.107)*	.316 (.128)*	.020 (.186)
Objective Strain * Social Support	.008 (.102)	.036 (.132)	-.183 (.189)
Subjective Strain * Spirituality	.042 (.136)	.114 (.167)	-.126 (.251)
Negative Life Experiences * Spirituality	.031 (.132)	.073 (.166)	-.196 (.231)
Objective Strain * Spirituality	.139 (.127)	.100 (.163)	.178 (.206)
Subjective Strain * Education	-.120 (.128)	-.063 (.157)	-.297 (.217)
Negative Life Experiences * Education	.136 (.112)	.150 (.128)	.031 (.197)
Objective Strain * Education	-.048 (.114)	.065 (.135)	-.264 (.197)
Subjective Strain * Age	-.112 (.159)	-.097 (.157)	-.175 (.381)
Negative Life Experiences * Age	-.141 (.168)	-.250 (.197)	-.081(.344)
Objective Strain * Age	-.158 (.206)	-.023 (.225)	-.193 (.397)
Significance levels (two-tailed tests)		p<.001***, p<.01**, p<.05*, p<.10+	
Significant Gender Differences (two-tailed tests)		p<.001^^^, p<.01^^, p<.05^, p<.10>	

Note: All interaction models were run with the inclusion of all independent variables: subjective strain, negative life experiences, objective strain, social control, low constraint, deviant peers, deviant values, social support, spirituality, education, gender and age.

A negative interactive relationship between stress and deviant was observed in the female sample only. Contrary to predictions, women reporting high levels of stress were less likely to use hard drugs when they also had many drug using peers. A similar relationship was reported between negative life experiences and deviant peers in the female model. Females in poor health were more likely to use hard drugs when they had fewer deviant peers; this relationship was significantly stronger in females than in males, $z=-3.070$, $p<.05$.

Prescription Drug Use

Table 21 presents the results of a logistic regression on whether respondents had used 0 or 1-4 prescription drug types in the past 12 months. In the full sample, consistent with predictions, both types of subjective strain were positively related to using prescription drugs. High levels of stress and poorer health were related to an increase in the likelihood of prescription drug use. For each unit increase in stress levels and negative life experiences, the likelihood of using prescription drugs increased by about 47% and 32% respectively. A marginally significant and negative relationship was reported between objective financial strain and prescription drug use.

In terms of conditioning variables, social control was negatively and significantly related to prescription drug use; marriage was associated with a lower likelihood of prescription drug use. As expected, low constraint and drug using peers were positively and significantly associated with prescription drug use; respondents scoring high on these measures were more likely to have used prescription drugs. For each unit increase in low constraint and deviant peers, the likelihood of using prescription drugs increased by about 8% and 17% respectively, holding all other variables constant.

Table 21. Logistic Regression Estimates of the Effects of Strain and Other Theoretically Relevant Variables on Prescription Drug Use in the Past 12 Months (log-odds and odds ratio).

	Full Sample b [odds ratio] (se)	Males b [odds ratio] (se)	Females b [odds ratio] (se)
Strain Variables			
Subjective Strain (Stress)	.384 [1.468] (.036)***	.385 [1.467] (.055)***	.386 [1.471] (.047)***
Negative life Experiences (Poor Health)	.276 [1.318] (.032)***	.206 [1.293] (.048)***	.288 [1.334] (.042)***
Objective Strain (Household Income)	-.030 [.971] (.016)+	-.022 [.978] (.025)	-.033 [.967] (.021)
Conditioning Variables			
Social Control (Marriage)	-.149 [.861] (.041)*	-.171 [.843] (.100)+	-.123 [.884] (.086)
Low Constraint	.075 [1.078] (.020)***	.081 [1.084] (.030)**	.071 [1.073] (.026)**
Deviant Peers	.157 [1.170] (.037)***	.186 [1.204] (.053)***	.129 [1.138] (.051)*
Deviant Values	-.036 [.965] (.023)	-.032 [.968] (.033)	-.039 [.962] (.032)
Social Support	.029 [1.029] (.038)	.030 [1.030] (.056)	.025 [1.025] (.050)
Spirituality	.009 [1.009] (.034)	.037 [1.037] (.052)	-.015 [.986] (.045)
Education	-.030 [.971] (.018)+	-.058 [.944] (.027)*	-.004 [.996] (.024)
Control Variables			
Gender (female=1 male=2)	-.305 [.737] (.064)***	----------	----------
Age	.022 [1.022] (.010)*	.011 [1.011] (.017)	.031 [1.032] (.013)*
Constant	-2.800 (.250)	-2.964 (.250)	-2.936 (.333)
Log Likelihood	-3447.1702	-1484.8751	-1959.462
Sample Size	6735	3099	3636
Pseudo R square	.046	.044	.043
Significance Levels (two-tailed test)		p<.001***, p<.01**, p<.05*, p<.10+	
Significant Gender Differences (two-tailed test)		p<.001^^^, p<.01^^, p<.05^, p<.10>	

Neither of the social support variables was associated with prescription drug use. A marginally significant and negative relationship between education and prescription drug use was reported. Prescription drug use was the only dependent variable negatively associated with gender; females were more likely than males to have used prescription drugs. Age was positively and significantly related to prescription drug use; older people were more likely to have used prescription drugs.

When the sample was disaggregated by gender, no significant gender differences arose. As in the full sample, both types of subjective strain were positively related to prescription drug use. Low constraint and drug using peers also maintained their positive associations with prescription drug use for males and females. Social control was related to prescription drug use in the male model only. For males, being married or in a common law relationship was negatively associated with prescription drug use. On the other hand, age was positively associated with female's prescription drug use but not male's. Older women were more likely to have used prescription drugs. However, none of these gender differences were statistically different across models.

Table 22 presents the results of the associations of the interactions between strain and its moderators with prescription drug use in past twelve months. Several relationships were reported that were supportive of GST's conditioning variables. Social control moderated the association of objective strain with prescription drug use. Supportive of GST, the relationship was negative; respondents experiencing greater levels of objective strain were less likely to use prescription drugs when they were married or in a common law relationship.

Table 22. Ordered Logistic Regression Estimates of the Effects of Strain and Other Theoretically Relevant Variables on Using Prescription Drugs in the Past 12 Months (Models Omitted, Log-Odds).

	Full Sample b(se)	Males b(se)	Females b(se)
Subjective Strain * Objective Strain	.041 (.032)	.014 (.053)	.060 (.042)
Negative Life Experiences * Objective Strain	.006 (.029)	.030 (.047)	-.013 (.039)
Subjective Strain * Social Control	-.017 (.031)	.043 (.049)	-.065 (.041)
Negative Life Experiences * Social Control	.001 (.029)	.045 (.047)	-.028 (.039)
Objective Strain * Social Control	.071 (.032)*	-.165 (.052)**^	-.018 (.042)
Subjective Strain * Low Constraint	.012 (.021)	.015 (.031)	.012 (.027)
Negative Life Experiences * Low Constraint	.023 (.019)	-.015 (.031)	.049 (.025)+
Objective Strain * Low Constraint	.022 (.020)	.049 (.033)	.007 (.026)
Subjective Strain * Deviant Peers	.069 (.030)*	.023 (.041)	.125 (.046)**>
Negative Life Experiences * Deviant Peers	-.008 (.028)	-.045 (.039)	.023 (.039)
Objective Strain * Deviant Peers	-.021 (.028)	.019 (.041)	-.057 (.040)
Subjective Strain * Deviant Values	.025 (.022)	.002 (.034)	.048 (.032)
Negative Life Experiences * Deviant Values	.024 (.021)	.038 (.033)	.018 (.029)
Objective Strain * Deviant Values	.013 (.022)	.030 (.033)	-.004 (.031)
Subjective Strain * Social Support	-.006 (.040)	-.057 (.058)	.038 (.054)
Negative Life Experiences * Social Support	.002 (.032)	.039 (.048)	-.026 (.044)
Objective Strain * Social Support	-.036 (.035)	-.048 (.057)	-.027 (.048)
Subjective Strain * Spirituality	.054 (.033)+	.062 (.050)	.050 (.045)
Negative Life Experiences * Spirituality	-.019 (.031)	-.025 (.048)	-.021 (.040)
Objective Strain * Spirituality	-.056 (.032)+	-.114 (.051)*	-.014 (.041)
Subjective Strain * Education	-.013 (.033)	.018 (.051)	-.038 (.044)
Negative Life Experiences * Education	.017 (.030)	-.013 (.046)	.044 (.041)
Objective Strain * Education	.032 (.031)	.006 (.050)	.036 (.040)
Subjective Strain * Age	.008 (.033)	.096 (.056)+^	-.046 (.041)
Negative Life Experiences * Age	.002 (.031)	.084 (.050)+^	-.051 (.040)
Objective Strain * Age	-.038 (.034)	-.048 (.057)	-.044 (.044)
Significance levels (two-tailed tests)		p<.001***, p<.01**, p<.05*, p<.10+	
Significant Gender Differences (two-tailed tests)		p<.001^^^, p<.01^^, p<.05^, p<.10>	

Note: All interaction models were run with the inclusion of all independent variables: subjective strain, negative life experiences, objective strain, social control, low constraint, deviant peers, deviant values, social support, spirituality, education, gender and age.

Deviant peers and subjective strain positively interacted in relating to prescription drug use. High levels of stress were associated with a greater likelihood of prescription drug use at high levels of drug using peers. While the relationships were only marginally significant, spirituality moderated the relationship between stress and objective strain on prescription drug use. Contrary to expectations, respondents reporting high levels of stress were more likely to use prescription drugs when they also reported being highly spiritual but as expected, respondents reporting high levels of objective strain were less likely to use prescription drug when they also reported being highly spiritual.

When the sample was disaggregated by gender, some notable differences were observed. Social control significantly moderated the relationship between objective strain and prescription drug use for men but not for women. Substantively, men were better able to cope with objective financial strain when married, therefore less likely to use prescription drugs. The gender difference in coefficients was significant, $z=-2.199$, $p<.05$, suggesting that for men, social control is particularly important in protecting against the effects of objective strain on prescription drug use.

A marginally significant and positive interaction between low constraint and negative life experiences was observed in the female model only. Women in poor health were more likely to use prescription drugs when they had low constraint. This interaction, however, was not statistically different across models. The negative interaction between stress and deviant peers observed in the full model was only related to female prescription drug use; while the difference was only marginally significant, the female coefficient was stronger than the male coefficient, $z=1.66$ $p<.10$. Additionally, the

negative interaction between objective strain and spirituality only remained significantly associated with male prescription drug use. Substantively men were better able to cope with financial strain when they were more spiritual, therefore reducing the likelihood of prescription drug use. These interactions, however, were not statistically different across the gendered models.

Stress and negative life experiences positively interacted with age in the prediction of men's prescription drug use. While the effects were only marginally significant, men in poor health and those experiencing high levels of strain were more likely to use more prescription drugs when they were older. The effects were significantly stronger in men, $z=2.046$, $p<.05$ and $z=2.108$, $p<.05$ respectively, suggesting that the moderating effect of age is particularly strong for men.

CHAPTER 7 - DISCUSSION AND CONCLUSION

In general, the results were supportive of theoretical predictions and of the feasibility of using GST to explain substance use. The main effect findings largely supported predictions about the roles of subjective and objective strains as well as those of the conditioning variables in their relationships with drug and alcohol use. However, while some of the findings were encouraging, the results of the interaction effects were less supportive of hypotheses; many of the interactions tested were insignificant and several were not in the predicted direction. In terms of gender differences, severable patterns emerged in the results indicating that strain and its conditioning variables differentially associated with the substance use of males and females.

Supportive of GST, objective strain (household income) was associated with increases in drinking to cope and binge drinking. However, objective strain was negatively related to drinking frequency and was only marginally associated with drug use. Even though women reported higher levels of objective strain, when the sample was disaggregated by gender, objective strain tended to be related more often to the substance use patterns of males. Additionally, the relationship between objective strain and alcohol use tended to be stronger for males than for females. This finding is consistent with GST as Broidy and Agnew (1997) postulate that financial strain may be particularly important and relevant to men's coping behaviour.

Subjective strain, measured by stress levels, was the most consistent measure associated with substance use. Lending robust support to GST, high levels of stress were associated with increases in all seven dependent variables. On average, women reported experiencing higher levels of stress than men and that stress tended to have a stronger

relationship with the drug and alcohol use patterns of women. Without knowing the quality of the stressors that women were experiencing, it is difficult to ascertain the specific reasons why stress had a stronger relationship for women but it can be argued that women are more likely to interpret experiences and life events as stressful (see Dedovic et al.(2009) and Turner and Avison (2003)).

Providing additional support to GST, negative life experiences (poor health) were also consistently associated with drug and alcohol use. Poor health was related to increases in drinking to cope, binge drinking, using marijuana to cope, hard drug use and prescription drug use but like objective strain, was negatively related to drinking frequency. While poor health had a stronger relationship with using marijuana to cope for males and with the drinking frequency of females, there were no consistent gender differences in the effects of negative life experiences on substance use.

The current research also lent some support to the idea that objective and subjective strains positively interact in their association with deviance. It was observed in a number of models that individuals reporting higher levels of objective strain were more likely to use drugs and alcohol when they also had high levels stress. Substantively, highly stressed individuals were more likely to cope with that stress by using drugs and alcohol when they came from a household with low yearly income; the effects of objective and subjective strain compound, making it more difficult to cope through more legitimate channels of activity. Furthermore, lending strong support to predictions about gender, strain and substance use, the interaction between stress and objective financial strain was positively associated with marijuana use for males but negatively associated with marijuana use for females. Supporting Broidy and Agnew (1997), males may be

more likely than females to interpret their objective financial circumstances as stressful and therefore, be more likely to use marijuana as a coping mechanism.

Based on the pattern of results just discussed, we see that objective strain and negative life experiences were negatively related to drinking frequency but positively related to drinking to cope and to binge drinking. Strain may better predict coping or potentially problematic behaviours like drinking to cope and binge drinking rather than simply how often an individual drinks. By virtue of its measurement, the drinking frequency variable captured the regularity of drinking patterns but did not capture why respondents were drinking or how much they were drinking. Once drinking patterns were qualified in this fashion, negative life experiences and objective strains became positively associated as opposed to negatively associated with drinking behaviour. Individuals low in objective strain (high household income) may be able to afford to drink regularly but tend not to cope through the use of alcohol and tend to binge drink less. On the other hand, respondents high in objective strain (low household income) cannot afford to drink regularly but when they can afford it, they are more likely to binge drink and to use alcohol to cope with strain.

Social control was consistently related to lower levels of substance use; individuals with a stronger commitment to conventionality, measured by being married or in a common law relationship, were less likely to use drugs and alcohol than people who were single. Men tended to report higher levels of social control than women but by virtue of its measurement, the social control variable captured a limited dimension of social control; whether or not one is married does not qualify which partner is more controlled in the union and further, the variable does not capture other sources of social

control. A more qualified measure of social control may demonstrate that females are more socially controlled than are males. Also contrary to predictions but not surprising, social control tended to have a greater protective effect on the substance use patterns of men. While marriage represents a commitment to conventionality for both genders, it may be a greater source of stress for women as they typically take on more responsibilities for household management and raising children (Broidy and Agnew, 1997). Supporting this argument, Liu and Kaplan (2001) found that women reporting high levels of family strain were more likely to use illicit drugs when they were married and had children.

In terms of its conditioning effect, social control tended to moderate the association of objective strain with substance use. As hypothesized, the interactions between social control and objective strain were negative, indicating that at high levels of objective strain, married respondents were less likely to use substances than single respondents. More specifically, this effect was observed in the drinking frequency and prescription drug use models and in both cases the interaction had a stronger relationship with male substance use patterns. Overall, when comparing the role of social control by gender, a pattern emerges for men, whereby social control had a greater protective influence on substance use, and on moderating the relationship between objective strain and substance use.

Lending additional support to GST, low constraint was consistently related to increases in drug and alcohol use across all seven dependent variables. As predicted, males tended to be characterized by lower constraint than females were. In terms of lower order gender differences, low constraint was similarly associated with substance use

patterns by gender but did have a stronger association with male binge drinking while it had a stronger association with the likelihood of using marijuana to cope for women. Negative life experiences and objective strain tended to positively interact with low constraint in the association with substance use. The most consistent relationship observed was that low constraint tended to condition the association of objective strain with substance use, especially for females. Further, and contrary to predictions, the level of these relationships tended to be stronger for females than for males, indicating that when women are living in low income households, they are more likely to use drugs and alcohol when they have low constraint.

Drug using and alcohol using peers were consistently associated with higher levels and likelihood of drug and alcohol use, providing more support for GST. As hypothesized, women tended to have fewer drug and alcohol using peers than their male counterparts. In terms of lower order gender differences, deviant peers had a stronger association with men's likelihood of drinking to cope, of using marijuana and of using marijuana to cope. With a few exceptions, however, deviant peers largely failed to interact with objective and subjective strains as predicted.

With the exceptions of drinking to cope and prescription drug use, deviant values were consistently related to drug and alcohol use in the predicted direction. As expected, women tended to hold fewer deviant or more conventional values than men. However, when the sample was disaggregated by gender, deviant values was significantly related to the likelihood of drinking to cope, using marijuana to cope and using hard drugs for females only. Deviant values also had a stronger association with the likelihood of using marijuana to cope for females. Further, deviant values seemed to be particularly

important in moderating the relationship between strains and drinking frequency for females. When exposed to greater levels of strain, women were more likely to drink more frequently when they also held greater deviant values. This relationship was significantly stronger for women than for men. Taken together, these findings suggest that holding deviant values may encourage, to a greater extent, the substance use of females.

With the exceptions of drinking frequency and prescription drug use, social support, measured by helpful friends and family, was consistently associated with lower levels of substance use. Supporting GST, respondents with more social support were less likely to cope through the use of alcohol and marijuana. As predicted, women reported higher levels of social support and the protective effect of social support on whether or not one used marijuana to cope with stress was stronger for women than for men. As Broidy and Agnew (1997) argue, the quality and the maintenance of interpersonal relationships are particularly important to women, which explains why having supportive friends and family may be related to women's drug use more than men's. When interacting with objective strain and negative life experiences social support was actually associated with higher levels of binge drinking and hard drug use for men. Males with low household incomes tended to binge drink more when they reported that their friends and family were more supportive. Perhaps a method of social support provided by the friends and family of financially disadvantaged men is to drink with one another. However, men with low household incomes drank less frequently when they reported that their friends and family were more supportive. Taken together, these findings suggest that social support may encourage binge drinking but discourage frequent drinking in men with low household incomes.

Spirituality, another social support measure, was only associated with drinking frequency and marijuana use in the past year, relating to lower likelihoods of both. Spirituality was not associated with coping behaviours, binge drinking or hard drug use; this suggests that spirituality may have more to do with whether someone chooses to drink or use drugs but not how and why they use substances. As hypothesized, women scored higher than men on spirituality measures. Further, the negative relationship between spirituality and the likelihood of marijuana use was stronger for women than for men. The moderating effect of spirituality on the relationship between stress and drinking frequency was also stronger for women; women reporting high levels of stress drank less frequently when they reported being more spiritual.

Supportive of hypotheses, when taken together, the findings reported on both social support measures suggest that social support has a stronger protective effect for women than it does for men. Again, this finding can be contextualized in the argument that women attribute greater value than do men to the quality and maintenance of interpersonal relationships. However, while social support also tended to have a protective effect for men, its interaction with objective financial strain and negative life experiences was associated with higher levels of binge drinking. Financially disadvantaged men may be more likely than women to support one another by binge drinking because as was previously evidenced, they have more peers and values supportive of the behaviour.

In the above discussion, it has been noted that women reported experiencing higher levels of stress and objective strain but with the exception of prescription drug use, women were consistently less likely than men to use substances. It can be argued that

women are less likely to cope with high levels of strain by using substances as they tend to score higher than men on measures that protect against the effects of strain and lower on measures that encourage deviant coping. With the exceptions of social control and education in which men scored higher, women had more social support, were more spiritual, had fewer alcohol and drug using peers, held more conventional values and were characterized by greater constraint.

Education was also consistently related to substance use patterns. As predicted, with a few exceptions, higher educational attainment was associated with lower scores on substance use measures. Males tended to achieve higher levels of educational attainment than females. Contrary to predictions, education was positively related to drinking frequency, increasing the likelihood of frequent drinking for men and for women at high levels of education; this effect was stronger for women than for men. In terms of its conditioning influence, education largely failed to moderate the relationships between strain and drug use but did condition the relationships of strain with drinking to cope and binge drinking. Few gender differences were reported in the conditioning influence of education.

Another consistent predictor of drug and alcohol use was age. Older people were more likely to drink frequently and use prescription drugs while younger people were more likely to use drugs and alcohol to cope, to binge drink more and to use marijuana and hard drugs. Older people may have more health problems and as such may be more likely to be prescribed drugs while younger people may be more likely to self medicate by using illicit drugs and alcohol. Furthermore, older people may be able to afford more frequent drinking. While age predicted more frequent drinking, it negatively interacted

with negative life experiences and objective strain in the prediction of drinking frequency. This relationship was observed in men and women with no significant gender difference, suggesting that younger people with low household incomes and in poor health drank more frequently than older people facing the same strains. There were no consistent gender differences in how age moderated the effects of strain on substance use, suggesting that age affects males and females similarly.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

There are certain limitations to the current research and the majority of them revolve around the fact that the data was not collected specifically for testing how GST may explain substance use patterns. First, by design, the research is cross-sectional so causality cannot be determined. Second, the survey was designed to obtain a population sample but because random digit dialing was used, certain populations were excluded, including permanent residents of institutions, homeless people and homes without telephones. While this is a problem as these populations may be among those who use illegal substances the most, they constitute a minority of the Canadian population. Furthermore, there were large amounts of missing data, which means that many respondents were not represented in the analysis; it is possible that those who chose not to answer certain questions represent a unique sample. However, the sample sizes achieved in the analyses were still very large and included respondents from all over Canada. The goal of the current research was to provide an in depth look at how GST can explain drug and alcohol use in Canada and I believe that the sample at hand has allowed me to do this.

Second, because the data was not designed to test GST, strain measures were difficult to find and several of the conditioning variables were weak. For example, while a strong generalized stress measure (see Broidy 2001) was used to represent one type of subjective strain, specific types of strain like relational, family strain or work related strains were not available. Only one appropriate measure of objective strain was available: household income. Financial strain measures employed by other researchers have used indices of various financial problems (Peirce et al. 1994; Jukkala et al. 2008). Further, the measure of social control was operationalized by a commitment to conventionality which was measured by being single or being married/in a common law relationship. The quality of certain types of social control is lost by using this measure and other forms of social control are not measured; additionally, it is unknown which partner is more socially controlled by the union. Moreover, while valid, behavioural measures of low constraint were used and no measures of negative emotionality were available. Attitudinal measures of low constraint and negative emotionality would have been preferable.

Third, one of the most significant limitations is that no appropriate measures of emotions were available. As previously argued, anger and especially depressive emotions like anxiety, despair and hopelessness, are particularly important in explaining how subjective and objective strains may be related to substance use. As a result, the mediating effects of depression and anger were not tested. Additionally, in terms of gender differences in how strain is related to drug and alcohol use, depression is argued to be particularly important to the substance use patterns of women (see Agnew 2006;

Broidy 2001; Drapel 2005 and Swatt et al. 2007). So again, because of survey design, the scope of the current research was slightly limited.

Finally, the variability of the hard drug use measure was very low as the majority of Canadians surveyed did not use hard drugs. A target population sample of hard drug users may yield results more supportive of GST than did the current research.

Future research should design surveys and/or qualitative interviews that are specifically designed to test how general strain theory may explain substance use. Research designed in this fashion could overcome many of the current limitations by being able to measure more and various types of objective and subjective strains, have more appropriate measures of social control as well as being able to capture attitudinal measures of low constraint and negative emotionality. Furthermore, measures of anger and depression could be included; they would enhance the validity of the results as they are important to the strain perspective. Examining the relationship between strain, anger, depression and substance use could shed light on important gender differences, contributing to a greater understanding of the different reasons why males and females use drugs and alcohol. With the ability to create and administer one's own survey, one also can avoid or at least minimize the occurrence of missing data. In terms of GST's conditioning variables, the current research provided more of an overview of the different factors that may moderate the effects of strain on drug use by gender. Future research could benefit from probing these interactions further. Finally, it was found but not reported that the two types of subjective strain, stress and poor health, positively interacted in the prediction of prescription drug use, suggesting that there is potential to test these relationships in future research.

CONCLUSION

The current research has added some unique and important findings to the body of research on general strain theory for several reasons. First, the majority of studies testing general strain theory have tended to use adolescent or university samples while the current study made use of a national Canadian population sample. Second, only a few studies have specifically examined how GST can predict substance use and of those, none have been as comprehensive as this thesis. Third, only a few of the studies that have tested for gender differences in how strain and its conditioning variables are related to deviance have found any significant differences; the current research observed a multitude of ways in which males and females were differentially affected by strain and its conditioning variables.

From the reported results and their discussion, several conclusions can be drawn. First, with a few exceptions, subjective and objective strains were consistently associated with increases in substance use. In explaining these exceptions, it was argued that coping behaviours or what may be considered more socially deviant behaviours, binge drinking for example, are more likely to be positively related to strain than simply the frequency at which one consumes alcohol. Second, results were supportive of the positive interaction between objective and subjective strains on substance use. Third, GST's conditioning variables, social control, low constraint, deviant peers, deviant values, social support and education were consistently related to substance use patterns in the predicted directions. While there were many encouraging findings, several of the interaction effects between strain and its conditioning variables were insignificant or not in the predicted direction. A pattern was difficult to discern as it was observed that different conditioning variables

moderated the effects of different strains on different substance use behaviours. However, social control and low constraint were among the most consistent moderators of strain, decreasing and increasing the effects of strain on substance use respectively.

In terms of gender differences, it was observed that with the exception of prescription drug use in which females scored higher, females were consistently less likely to use substances than males. This finding may be explained by the fact that females tended to score higher on measures that are argued to protect against the effects of strain and lower on measures that are argued to increase the probability of deviant coping. When compared to men, women scored higher on both measures of social support and lower on measures of deviant peers, deviant values and low constraint. This finding also explains why, even though women were found to experience more stress and more objective strain than their male counterparts, they were less likely to use drugs and alcohol.

Consistent with GST and the predictions of Broidy and Agnew (1997), a pattern emerged in the results indicating that women's substance use patterns seem to be more strongly affected by subjective strain while those of men were more strongly affected by objective financial strain. The results pertaining to how the conditioning variables differentially affected gendered patterns of substance use were less clear. For example, drug using peers had a stronger influence on the drug use of males while low constraint had a stronger influence on the binge drinking and drug use of females. Whether acting as a main effect or a conditioning variable, deviant values seemed to have a stronger effect on women's substance use patterns. Social support measures tended to have a stronger

protective influence on the substance use patterns of females, providing them with more legitimate opportunities for coping.

The picture becomes even more complicated when attempting to find patterns in how the conditioning variables differentially moderate the effects of strain on drug and alcohol use by gender. Several significant differences were reported lending strong support to the hypothesis that GST's conditioning variables differentially moderate the effects of strain by gender. For example, social control tended to condition the relationship between objective strain and substance use more often and tended to have a stronger protective role for males than for females. On the other hand, social support, spirituality and low constraint tended to condition the relationships between strain and substance use more often and with a greater magnitude for females than for males. Noting these exceptions, there was no consistent overarching pattern of results; different interactions had stronger effects on different substance use behaviours for males and for females. The best conclusion that can be drawn from these results is that the conditioning variables do play an important role in determining gendered patterns of substance use and that further studies should expand on the findings of the current research.

In conclusion, the results were generally very supportive of hypotheses and of using general strain theory to explain substance use patterns in Canada. The current research has added valuable insight to the literature by providing a comprehensive picture of how strain, its conditioning variables and gender are related to drug and alcohol use.

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