

**THE ROLE OF STRESS, COPING AND NEGATIVE
AFFECT AS DYNAMIC RISK FACTORS OF
INTERPERSONAL VIOLENCE AND VICTIMIZATION**

by

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ABSTRACT

Individuals living with major mental illness (MMI) have an elevated risk of committing violence against others as well as experiencing violent victimization relative to those without psychiatric symptoms. A vast body of research has focused on identifying risk factors for engaging in violence; however, factors that contribute to violent victimization among this population are less explored. Identifying dynamic risk factors to target for intervention assists in mitigating the risk for harmful outcomes. Reducing the likelihood of becoming involved in violent interactions protects the individual and potential victims of violence, as well as curtails personal, economic and societal costs.

The purpose of this study was to explore stress, coping, and negative affect as potential risk factors for both prospective violence and victimization among individuals with MMI. The sample consisted of 74 civil psychiatric patients admitted to an emergency room of an urban hospital with a psychiatric facility in British Columbia. Participants completed a series of interviews and self-report measures assessing demographic information, psychiatric symptoms, mental health history, history of substance use, history of violence, and static and dynamic risk factors for adverse outcomes. Assessments took place at hospital discharge and every four weeks in the community for six months.

Violence and victimization outcomes were collapsed across the follow-up period for analyses. One third of the sample reported engaging in violence, as

well as experiencing violent victimization. After controlling for psychopathy, higher levels of stressful daily hassles were associated with an increased risk of violence perpetration. Daily hassles and perceived stress (marginal significance) were predictive of increased risk of victimization. Coping was associated with a reduced likelihood of victimization.

Gender did not moderate the effects of coping on victimization or violence; however, there was some evidence that gender moderated the effect of Task coping on violence. Coping was not found to mediate the effect of stress on victimization. Higher levels of daily hassles were associated with quicker post hospitalization violence perpetration and victimization. Increased levels of perceived coping were marginally associated with slower rates of victimization post discharge. Implications of the findings for risk management and prevention are discussed.

Keywords: Violence, Victimization, Mental Illness, Stress, Coping, Affect

To my son, Evan

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TABLE OF CONTENTS

Approval	ii
Abstract	iii
Dedication	v
Acknowledgements	vi
Table of Contents	vii
List of Figures	ix
List of Tables	x
1: Introduction	1
1.1 Violence and Mental Illness	3
1.2 Risk Factors for Violence.....	5
1.3 Violent Victimization and Mental Illness	8
1.4 Risk Factors for Victimization	10
1.5 Risk Assessment.....	11
1.6 Risk Factors: Static and Dynamic	13
1.7 Elements of the Stress Process: The Transactional Model	15
1.8 Stress.....	18
1.8.1 Stress and Mental Illness	19
1.9 Coping.....	22
1.9.1 Dispositional View of Coping.....	23
1.9.2 Situational View of Coping	24
1.9.3 Coping Dimensions.....	25
1.9.4 Coping and Mental Illness	27
1.9.5 Gender and Coping.....	28
1.10 Negative Affect	29
1.10.1 Anger	30
1.11 Theoretical Support for Elements of the Stress Process as Predictors of Violence and Victimization.....	31
1.11.1 Strain Theory	32
1.11.2 Frustration-Aggression Hypothesis	33
1.11.3 Social Interactionist Approach.....	35
1.12 Empirical Support for Elements of the Stress as Predictors of Violence and Victimization	36
1.12.1 Stress	36
1.12.2 Coping	37
1.12.3 Negative Affect	38
1.13 Purpose of the Present Study	42
1.13.1 Hypotheses	42

2: Method	44
2.1 Participants	44
2.2 Procedure.....	46
2.2.1 Baseline and Follow-Up Interviews	47
2.2.2 Study Completion.....	48
2.2.3 Attrition	48
2.3 Measures	49
2.3.1 Stress Measurement.....	49
2.3.2 Coping Measurement.....	51
2.3.3 Negative Affect Measurement.....	55
2.3.4 Violence and Victimization Measurement.....	57
2.3.5 Measurement of Control Variables	58
3: Results	63
3.1 Descriptives for Outcome	63
3.1.1 Violence	63
3.1.2 Victimization.....	64
3.2 Hypothesis Testing	65
3.2.1 Control Variables	67
3.2.2 Violence Prediction	69
3.2.3 Prediction of Victimization	70
3.3 Moderation Analysis	72
3.4 Mediation Analysis.....	74
3.4.1 Criteria for Establishing Mediation.....	75
3.4.2 Mediation with Dichotomous Outcomes	76
3.4.3 Mediation Hypotheses	78
3.5 Hazard Analysis	81
4: Discussion	85
4.1 Implications	91
4.2 Limitations	93
4.2.1 Small Sample Size.....	93
4.2.2 Confounding of Outcome Variables	94
4.2.3 Extraneous Control Variables.....	95
4.2.4 Restricted Time Point Measurement	96
4.2.5 Self-Report Measurement	97
4.2.6 Broad Categorizations	97
4.3 Directions for Future Research.....	98
4.4 Conclusion	100
5: References	102
Appendix	120

LIST OF FIGURES

Figure 1: Direct Effect and Typical Mediation Model	75
Figure 2: Mediation Model for Dichotomous Outcomes using Logistic Regression	77

LIST OF TABLES

Table 1: Sample Demographics for Baseline Sample	45
Table 2: Completion Rates of Individual Follow-Up Waves.....	48
Table 3: Baseline and Follow-Up Assessment Protocols	50
Table 4: Mean CISS-SSC Scores by Gender	53
Table 5: Component Loadings for PCCEA-B	55
Table 6: Mean Scores for Predictor and Control Variables	62
Table 7: Number of Participants Reporting Violence Perpetration at Each Wave of Follow-Up	64
Table 8: Number of Participants Reporting Victimization at Each Wave of Follow-Up...	65
Table 9: Disaggregated Outcome Frequencies.....	65
Table 10: Regression Coefficients for Violence Control Variables	68
Table 11: Regression Coefficients for Victimization Control Variables	69
Table 12: Regression Coefficients for Predictors of Violence Controlling for Psychopathy	70
Table 13: Regression Coefficients for Predictors of Victimization	72
Table 14: Regression Coefficients for Interaction Terms Moderation Analysis	74
Table 15: Regression Coefficients in the Prediction of Coping Competence by Perceived Stress	79
Table 16: Regression Coefficients in the Prediction of Victimization by Coping Competence and Perceived Stress	80
Table 17: Testing the Direct and Indirect Effects within the Coping Mediation Model....	80
Table 18. Cox Regression Coefficients for Violence Outcomes	83
Table 19. Cox Regression Coefficients for Victimization Outcomes	84

1: INTRODUCTION

Individuals who are mentally ill are at greater risk of experiencing adverse outcomes related to violence relative to those who are not disordered. Mental illness has long been associated with violence (Harris & Lurigio, 2007); indeed, public perception of people with mental illness as “dangerous” is a pervasive and powerful stereotype that has historically stigmatized this population (Link, Phelan, Bresnahan, Stueve, & Pescosolido, 1999; Pescosolido, Monahan, Link, Stueve, & Kikuzawa, 1999). Empirical evidence suggests that those living with psychosis are more likely to behave aggressively compared to individuals with no psychiatric symptoms (see Choe, Teplin, & Abram, 2008; Douglas, Guy, & Hart, 2009; Gilles & O’Brien, 2006 for reviews). In fact, a vast body of research has been devoted to identifying risk factors for engaging in violence among those with major mental illness (MMI)¹. Certainly the link between mental illness and violence has focused on individuals with MMI as *perpetrators* of violence (e.g., Link, Stueve, & Phelan, 1998; Monahan et al., 2001; Tardiff, Marzuk, Leon, & Portera, 1997); yet, those who experience psychiatric symptoms are also disproportionately *victimized* by violence compared to those whose mental health is less compromised (see Maniglio, 2009 for a review). Compared to risk factors for violence, factors that contribute to the experience of violent victimization among those with MMI are currently understudied (Teasdale, 2009).

¹ Major mental illness typically includes individuals who experience severe psychiatric symptoms such as those captured in Axis I of the DSM-IV-TR, e.g. psychosis.

The need to protect members of this vulnerable population from the incidence of adverse outcomes stemming from violent interactions represents significant personal and public health and safety concerns. In light of the increased risk among individuals with MMI for both committing violence and being violently victimized, it is crucial to identify risk factors that contribute to these harmful outcomes. Understanding risk factors that underpin these violent outcomes is imperative in designing appropriate prevention initiatives, intervention planning, and risk management. Notably, dynamic risk factors (i.e., modifiable factors that change over time) as opposed to static risk factors (i.e., generally historical factors that remain stable over time) are particularly useful to uncover because they can be targeted for intervention. Reducing the likelihood of becoming involved in violent interactions protects the individual, potential victims, as well as curtails potentially enormous personal, economic and societal costs (e.g., legal, correctional, physical and mental health treatment).

The present study investigates violent behaviour and victimization among discharged civil psychiatric patients dwelling in the community. Specifically, this study explores components of the stress process (i.e., stress, coping, negative affect) as possible dynamic risk factors for both prospective violence and victimization among individuals with MMI. Given theoretical and empirical support, I will argue that elements of the stress process are promising potential risk factors of violent outcomes that warrant further investigation. This dissertation begins with a review of research examining the association of mental illness with violence and victimization, respectively. The concept of risk

assessment is discussed. Next, constructs of stress, coping and negative affect are explored, including a synthesis of theory and empirical evidence underscoring their suitability as potential risk factors for violence and victimization. Following this, the study methodology, data analysis, and results are presented. The dissertation concludes with a discussion of implications of the findings, study limitations and directions for future research.

1.1 Violence and Mental Illness

There has historically been an assumption that mental illness and violence are related (Harris & Lurigio, 2007), despite oscillation of general scholarly opinion over the past number of decades (Douglas et al., 2009). Research conducted on the subject 25 years ago typically concluded that there was no apparent association between MMI and violence (e.g., Monahan, 1981; Teplin, 1985). Since then, a vast amount of research has been conducted using a range of methodologies (e.g., self-report, epidemiological, birth cohort), temporal periods (i.e., pre-, during, post- hospitalization), and settings (i.e., correctional, forensic, civil, general population) to explore this association.

Perhaps one of the most influential studies investigating the relationship between mental illness and violence was the MacArthur Violence Risk Assessment Study (Monahan, 2002; Monahan et al., 2001, Steadman et al., 1998). This study involved the longitudinal assessment of 1136 acute civil psychiatric patients every ten weeks over the first year after discharge from mental health facilities in three US states. Patients were monitored for violence against others and were assessed on a broad variety of variables thought to be

related to community violence. About 27.5% of discharged patients acted violently during the one year follow-up as measured through a combination of self-report, collateral informant report and agency records (Steadman et al., 1998). Monahan and colleagues identified a number of risk factors for engaging in violence among this large sample (e.g., violent fantasies, substance misuse, treatment non-compliance), but did not establish a robust association between MMI and violence. Arboleda-Florez, Holley and Cristanti (1998) similarly found no support that MMI causes violence in their systematic review of relevant research. Yet, other studies have uncovered a link between the two (e.g., Bjørkly, 2002; Swanson et al., 2006). A definitive conclusion about the specific role of MMI in causing aggressive behaviour has been elusive despite the burgeoning body of research because findings altogether have been vastly mixed. These equivocal conclusions are most likely due to methodological differences, inconsistent operational definitions, and failure to control for confounding variables (Douglas et al., 2009).

Recently, Douglas and colleagues (2009) conducted a meta-analysis of 885 effect sizes reported in studies examining the relationship between psychosis and violence and found that psychosis was significantly associated with a 49%-68% increase in the likelihood of violence. That is, there is evidence that the *relative* risk for engaging in violence is about 1.5 times greater for individuals with psychosis relative to the general population (Douglas et al., 2009); yet, most estimates of the *attributable* risk of major mental illness (i.e., the proportion of all violence in the population that can be assigned to the presence

of major mental illness) is small to moderate in size (i.e., less than 5%; Link & Stueve, 1995; Monahan, 1992; Walsh, Buchanan, & Fahy, 2002). It is generally accepted that the majority of people with mental illness do not behave violently (Swanson et al., 1990). For those individuals who do, however, the mechanisms through which illness, symptoms, or related factors, contribute to the risk for committing violence are still poorly understood (Douglas et al., 2009; Hiday, 1997, 2006).

1.2 Risk Factors for Violence

Violence has been defined as actual, attempted, or threatened physical harm of another person that is deliberate and non-consensual (e.g., Webster, Douglas, Eaves, & Hart, 1997); other authors have defined violence more exclusively as physical battery inflicting injury, sexual assault, and threats and acts committed with a weapon (e.g., Monahan et al., 2001).² Research has consistently demonstrated that discharged psychiatric patients do not form a homogenous group in relation to perpetrating violence in the community. A number of characteristics have been found to increase the likelihood of psychiatric outpatients engaging in violence. Arguably, the most robust finding is that the prevalence of violence engaged in by outpatients dramatically increases with the presence of co-occurring substance misuse (Mulvey et al., 2006; Steadman et al., 1998; Swanson et al., 2002).

² The lack of a universally used definition of violence has lead to difficulties in merging results of violence research.

In addition, investigators have found that Cluster B personality disorders [e.g., psychopathic personality, anti-social personality disorder (ASPD)] are highly predictive of subsequent violence among offenders both with and without mental illness (Crocker, Mueser, Drake, et al., 2005; Monahan et al., 2001; Mueser, Drake, Ackerson, et al., 1997; Rice & Harris, 1995; Skeem & Mulvey, 2001). Further, individuals who experience persecutory delusions (e.g., threat-control override delusions, TCO) are more likely to engage in violence relative to those who do not (Bjørkly, 2002; Link, Andrews, & Cullen, 1992; Swanson, Borum, Swartz, & Monahan, 1996; but see Appelbaum, Robbins, & Monahan, 2000 for a notable exception). Psychiatric patients who persistently make hostile attributions toward situational events and other people are also more likely to perpetrate community violence than those who have not adopted this attributional style (McNiel, Eisner, & Binder, 2003).

There are numerous potential explanations for the link between violence and mental illness. It has been postulated that this relationship can be explained through the experience of delusions and hallucinations that might provoke aggression when these positive symptoms give rise to the irrational perception of a threat (Douglas et al., 2009). Indeed, discharged psychiatric patients who committed violent acts or threatened to do so also expressed feeling threatened by people they knew, and were often in actuality violently victimized by family members (Swanson, Borum, Swartz, & Hiday, 1999; Swanson et al., 1998). Moreover, the experience of psychiatric symptoms might destabilize behaviour and decision-making. This disorganization inhibits the individual's ability to

negotiate interpersonal conflict effectively and can contribute to impulsive aggression (Douglas et al., 2009). Silver (2002) suggested that persons with MMI tend to be involved in *conflicted relationships*. Those with MMI, especially individuals with substance use disorders or psychosis, may bring negative stimuli into their interpersonal relationships. Negative stimuli, such as disturbing behaviour or treatment refusal, might cause conflict when caretakers try to control the individual by pressuring him or her to desist or comply (Hiday, 1997). These social control attempts may evoke negative affect and aggravation on the part of those with MMI which in turn may contribute to their aggression, particularly in instances of involuntary (i.e., forced) treatment (Silver, 2002). Finally, to the extent that those with MMI are more often targeted with violent victimization, they might reciprocally respond with self-defensive aggression in an attempt to protect themselves.

Not surprisingly, a history of perpetrating violence is associated with experiencing other types of deleterious outcomes. Among those with MMI, committing violence in the past is related to future violence perpetration (Monahan et al., 2001), violent victimization (Hiday, Swanson, Swartz, Borum, & Wagner, 2001), as well as suicide and self-harming behaviours (Hillbrand, 2001; Nicholls, Brink, Desmarais, Webster, & Martin, 2006). Moreover, involvement in violence disrupts concurrent personal treatment efforts, compromises mental health and quality of life, and contributes to the alienation of social supports (Douglas et al., 2009). Given these multiple related adverse outcomes, it is

critical to accurately identify characteristics of those in this vulnerable population who are at increased risk for behaving violently.

1.3 Violent Victimization and Mental Illness

An abundance of research has examined violence committed by individuals with MMI; however, there has been less empirical attention centered on violent victimization experienced by this population, at least until relatively recently (Teasdale, 2009). Research demonstrates that individuals with mental illness are at greater risk of being victims of violence relative to those who are not disordered (Hiday, Swanson, Swartz, Borum, & Wagner, 1999, 2001; Silver, 2002; Silver, Arseneault, Langley, Caspi, & Moffit , 2005). The prevalence of lifetime victimization among individuals with mental illness is exceptionally high. Disproportionally high rates of childhood physical, sexual and emotional abuse have been reported among this population (Cascardi, Mueser, DeGiralomo, & Murrin, 1996; Lipschitz et al., 1996; Mueser et al., 1998; Rosenberg, Lu, Mueser, Jankowski, & Cournos, 2007).

Moreover, current victimization is common among adult psychiatric outpatients. Maniglio (2009) conducted a systematic review of studies examining the association between mental illness and criminal victimization. He summarized that prevalence estimates of violent victimization among mentally ill individuals ranged from 4.3% to 35%, and that victimization rates were between 2.3 and 140 times higher among populations with mental illness relative to the general population. These reported rates vary widely due to differences among reviewed studies in length of follow-up period (ranging from one month to three

years), sampling procedure, and operational definitions. Examining only studies that employed a one year follow-up included in this review, those with MMI were 2-11 times more likely than the general population to report violent victimization (Maniglio, 2009). Similarly, Choe and colleagues' (2008) review of US studies examining violence and violent victimization of individuals with severe mental illness found that 20% to 34% of outpatients were violently victimized over the past six months to three years. Those with MMI are most likely to be victimized by family members (Carmen, Rieker, & Mills, 1984).³

Initial research on adult victimization experienced by those living with mental illness tended to focus on domestic violence perpetrated by partners and other family members (Cascardi et al., 1996). Research was later extended to include victimization experienced outside of the home as well. Silver and colleagues (2005) examined violent victimization in a total birth cohort of New Zealanders and found that those with MMI were twice as likely to be victimized compared to healthy peers. Similarly, Hiday et al. (1999) found that while there were no differences in the rate of non-violent victimization among psychiatric patients and the general population (22.4%, 21.1% respectively), the rate of violent criminal victimization in the four months prior to hospitalization was more than 2.5 times greater relative to the general population (8.2%, 3.1%, respectively).

³ Notably, studies that compare rates of victimization (and violence) to the general population should be interpreted with caution. The comparison might be biased given that there are factors among MMI samples that increase the likelihood of violent outcomes (e.g., neighbourhood context) that are often not controlled for in the comparison sample. Alternatively, it has been argued that, according to the geographic drift hypothesis, mental illness plays a causal role in bringing about other risk factors (e.g., low SES); thus it is unclear whether such variables should be controlled conceptually (Douglas et al., 2009)

It has been postulated that individuals with severe mental illness are more vulnerable to violent victimization given their mental impairment (e.g. poor reality testing, judgment, social skills, planning, and problem solving), the social context of their lives (e.g. poverty, unemployment, homelessness, social isolation and lack of meaningful activities, guardianship and protected environments), and involvement in risky situations (e.g., substance use, aggression; Hiday et al., 1999; Lehman & Linn, 1984; Maniglio, 2009). Theoretically, the *Routine Activities* perspective (Cohen & Felson, 1979) suggests that odds of victimization increase when there is a collusion of a motivated offender, a suitable target, and a lack of capable guardianship. This framework predicts that legitimate activities that reduce guardianship and increase target suitability increase the risk of victimization. Thus, those with MMI might be more vulnerable to attack because their capacity to engage in “vigilant self-defence” is undermined, and/or has the appearance of being deficient, making them attractive targets to prey upon (Silver et al., 2005; Teasdale, 2009). Individuals with MMI who are unemployed, single, transient, or lack social support tend to have fewer guardians available to protect them (Teasdale, 2009). Further, existing guardians may be alienated from a person with MMI during times of psychiatric deterioration, resulting in an elevation of risk for victimization (Teasdale, 2009).

1.4 Risk Factors for Victimization

Because victimization has been understudied, relatively fewer risk factors have been identified compared to violence prediction. Most studies that have examined the association between mental illness and victimization have utilized

chiefly cross-sectional and retrospective accounts, limiting the conclusions that can be made regarding the nature or strength of predictors of risk (Teasdale, 2009). Empirically, victimization tends to occur among those with MMI who have a previous history of victimization (Hiday, Swartz, Swanson, Borum, & Wagner, 2002), misuse substances (Brekke, Prindle, Bae, & Long, 2001; Hiday et al., 1999), are homeless (Hiday et al., 1999, D'ercole & Struening, 1990; Goodman, Dutton, & Harris, 1997), and experience more severe psychiatric symptoms, such as TCO delusions (Brekke et al., 2001; Teasdale, 2009) .

Similar to violence, violent victimization among people with MMI is associated with other adverse outcomes. Childhood victimization has been shown to have significant, long-term, harmful effects on mental health (Mueser et al., 1998; see Chapman, Dube, & Anda, 2007 and Rosenberg, Drake, & Mueser, 1996 for a review). For example, a history of childhood victimization is related to engaging in prospective interpersonal violence (Monahan et al., 2001). Similarly, violent victimization experienced as an adult has been linked with committing violence (Hiday et al., 2001) as well as psychiatric deterioration (Brekke et al., 2001; Teasdale, 2009). These multifarious outcomes illustrate the clear importance of addressing violence and victimization specific to this population.

1.5 Risk Assessment

Understanding and establishing reliable risk factors for violent outcomes among those with MMI is a critical step in reducing the incidence of harmful outcomes. Specifically, known risk factors can be included in risk assessment schemes and targeted in risk management efforts. Violence risk assessment is

an area that has been highly developed; however, the logic for addressing risk of violent victimization is the same as that for violence. That is, identifying and resolving causal risk factors for victimization will reduce the incidence of victimization. Risk is a multifaceted concept that refers to the likelihood that a hazard will occur, including the imminence, frequency and duration of the hazard, as well as the seriousness of the associated consequences (Boer, Hart, Kropp, & Webster, 1997; Hart, 1998). Violence risk assessment is the process of appraising individuals in order to characterize the risk that they will engage in violent behaviour. Violence risk assessment facilitates the development of interventions to reduce or manage that risk in order to ultimately prevent violence (Hart, 1998).

Conventionally, there are three types of decision-making approaches to risk assessment: unstructured clinical assessment, actuarial decision-making and structured professional judgment (SPJ). Unstructured clinical judgement involves decision-making based primarily on professional human opinion. Assessors have absolute discretion over selecting which information to consider, and how to synthesize, and interpret information to render a decision about risk (Grove & Meehl, 1996). The actuarial approach involves applying a predetermined set of explicit, typically statistically derived decision rules in order to come to a final judgement (Dawes, Faust, & Meehl, 1989; Meehl, 1954; Monahan, 1981). The SPJ model of decision-making is a form of clinical assessment that is guided by a systematic consideration of scientifically validated factors (i.e., HCR-20; Webster et al., 1997). There are no explicit rules for combining items to arrive at

a decision; however, the clinical decision-making process is structured (for a review, see Douglas, Ogloff, & Hart, 2003). Risk factors are selected rationally from a comprehensive consideration of the scientific literature. Importantly, SPJ methods emphasize risk *management* as opposed to risk prediction (Doyle & Dolan, 2004), and underscore that evaluating risk is a continuous and dynamic process (Doyle, 2000). Hence, establishing risk factors for inclusion in risk assessment schemes assists in risk management efforts for harmful outcomes such as violence and victimization.

1.6 Risk Factors: Static and Dynamic

A “correlate” is a measure that is associated with an outcome in some way, whereas a “risk factor” is a correlate that is shown to *precede* the outcome (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001). Static risk factors are those that remain stable over time and are generally historical (e.g., past history of violence). Dynamic risk factors are those things that change over time (e.g., substance misuse). Kraemer, Kazdin, Offord, & Kessler (1997) developed a typology that defined a causal dynamic risk factor for an outcome as a variable demonstrated to: i) precede and increase the probability of the outcome, ii) change spontaneously or through intervention, iii) predict changes in the likelihood of the outcome when altered. While identified static risk factors might demonstrate strong predictive ability, they are not reversible. Dynamic factors are essential to risk assessment and management because risk of the outcome itself changes over time, and because true causal dynamic risk factors are excellent candidates for targeted intervention.

Monahan and colleagues (2001) defined four basic categories of risk factors for violence. Two categories describe factors that are assumed to be static in nature: *dispositional* factors and *historical* factors; and two categories describe factors that are subject to change: *contextual* factors and *clinical* factors.

According to Monahan (1996), dispositional variables are defined as demographic factors such as age, gender, social standing, as well as personality variables (e.g., impulsivity, anger, psychopathy) and neurological factors (e.g., traumatic brain injury). Historical variables refer to significant events experienced in the past, such as familial history, employment history, mental health history, and history of violence and crime. Contextual variables describe present social support, social networks, stress, and environmental aspects (e.g., overcrowding, presence of weapons). Clinical variables refer to symptoms of mental illness, personality disorder, substance abuse, and level of functioning (Monahan, 1996). These distinctions are useful in conceptualizing risk factors for violence as well as violent victimization among those with MMI.

Among the two types of dynamic risk factor categories described above, extant research on violence risk typically focuses on clinical risk factors (Silver & Teasdale, 2005). Many of the existing explanations of the link between MMI and violence focus narrowly on clinical characteristics (e.g., persecutory delusions, psychiatric deterioration, substance abuse disorders) and are premised on the assumption that the propensity toward aggression among individuals with MMI is linked fundamentally to the mental illness itself (Monahan, 1992). Research that examines victimization of those with MMI is more successful in exploring both

types of dynamic risk factors (i.e., clinical factors as well as contextual factors such as homelessness, neighbourhood poverty). In general, the search for true dynamic risk factors of violence and victimization might benefit from an extension of focus beyond clinical characteristics to include a more ecological approach that takes into account the social contexts within which the mental illness and adverse outcomes transpire (Silver & Teasdale, 2005). One such constellation of promising dynamic risk factors include components of the stress process (i.e., stress, coping, negative affect) as described in the Transactional Model of stress and coping (Lazarus & Folkman, 1984).

1.7 Elements of the Stress Process: The Transactional Model

The present study explores elements of the Transactional Model of stress and coping proposed by Lazarus and Folkman (1984) as potential dynamic risk factors for both violence and victimization among individuals with MMI. In the Transactional Model, it is postulated that an individual's coping strategies change throughout the duration of a specific stressful experience. This framework emphasizes that coping is a *process* that unfolds within the *context* of a specific situation that an individual appraises to be demanding and personally significant (Lazarus & Folkman, 1984). Lazarus and Folkman theorized that coping was a shifting process in which individuals rely more heavily on one form of coping, for example defensive strategies, at some times, and problem-solving strategies, at other times, as the context of the person-environment relationship changes. Stress and coping often share a reciprocal relationship in that ineffective coping

leads to elevated (or unabated) levels of stress, and alternatively, effective coping corresponds to reduced levels of stress (Lazarus, 1999).

According to the Transactional Model, stress occurs when a relationship between an individual and the environment is appraised as demanding or overwhelming the individual's resources and jeopardizing personal well-being. The notion of appraisal is central to this model (Folkman, Lazarus, Gruen, & DeLongis, 1986), in that cognitive appraisal processes influence the perceived stressfulness of events (Lazarus & Folkman, 1984). There are two types of appraisal theorized: primary and secondary. In primary appraisal, the person evaluates the personal significance of the current situation relative to personal values, goal commitments, beliefs about self and world, and situational intentions to determine whether there is a personal stake in the situation and whether a threat to well-being exists. Encounters are appraised as irrelevant, beneficial, or stressful. If the event is appraised as stressful, it is assessed as either a harm/loss, a threat, or a challenge (Lazarus, 1999). Harm/loss appraisals are associated with damage or an injury that has already taken place. A threat appraisal refers to an anticipated event that could produce harm or loss. Challenge appraisals are made for events that have the potential for growth, mastery or gain. The nature of appraisal explains why the same situation is stressful for some people and not for others; the level of perceived stress depends on the situation itself as well as the kind of primary appraisal that is made.

If the event is judged to be stressful, a *second appraisal* follows, which is an assessment of the individual's available options and available coping resources (e.g., social support) that can be used to overcome or regulate the stressful situation (Lazarus & Folkman, 1984). Coping resources (i.e., social and personal characteristics from which people can draw when confronting a stressor) are presumed to influence the choice and efficacy of coping strategies used (Folkman, 1984). The nature of appraisal will influence the type of coping strategy employed and the probable emotional response. That is, the choice of coping strategy will typically vary given the significance and requirements of each stressful encounter which itself changes over time.

Emotion plays a key role in the Transactional Model of stress and coping. According to the model, stress, emotion, and coping form a conceptual unit, where coping is a mediator of the emotional outcome of the stressful encounter (Folkman & Lazarus, 1988a, 1988b).⁴ For example, adaptive coping leads to changes in emotion from negative to positive while maladaptive coping leads to emotional changes in the opposite direction. Stress and emotion are postulated to be interdependent constructs that are influenced by the individual's appraisal of the situation. Because appraisal is based on individuals' past experiences, various stressors can generate particular emotional responses. Harm/loss stressors can produce disappointment, anger, fear, or sadness; threatening stressors can elicit fear, anxiety, and anger; and challenging stressors can

⁴ Notably, there are alternate theories of stress and coping that suggest that coping might moderate stress as opposed to mediate stress as Lazarus and Folkman postulate. The Transactional Model was selected as a beginning framework for this study because it is the most well-known of the perceived stress theories.

generate positive emotions such as eagerness or excitement. Yet, certain emotions are ostensibly stress emotions (e.g., anger, anxiety) because they generally arise from stressful conditions.

Therefore, based on the Transactional Model, the constructs of interest for the present study include stress, coping and negative affect. In this section, these constructs are discussed in detail. Following this, theoretical and empirical support for a predictive relationship between these elements and outcomes related to violence and victimization is presented.

1.8 Stress

Stress is defined as a “state of arousal resulting either from the presence of socio-environmental demands that tax the ordinary adaptive capacity of the individual or from the absence of the means to attain sought after ends” (Aneshensel, 1992, p.16). Selye (1976), a pioneer of stress research, proposed the General Adaptation Syndrome (GAS) to explain the physiological reactions to stress. GAS theory describes three distinct stages: alarm (i.e., immediate fight or flight response), resistance (i.e., bodily adaptation to continued exposure to stress), and exhaustion (i.e., decreases in resistance and eventual collapse due to long-term stress). Modern theories of the stress process consider three key conceptual dimensions: sources of stress, manifestations of stress, and mediators of stress.

A stressor refers to any external or internal demand that necessitates the individual to adapt their usual behaviour (Thoits, 1995). External, independent stressors (e.g., interpersonal conflict) and internally generated stressors (e.g.,

fear of failure) are two origins of stress. Stressors trigger behavioural and cognitive coping efforts. As stressors accumulate, coping abilities and resources are depleted, resulting in increased psychological distress when stressors are not neutralized (Thoits, 1995). Three broad forms of stressors have been explored: life events, chronic strains, and daily hassles. Life events are acute changes that require major behavioural readjustments within a relatively short period of time (e.g., death of a loved one). Chronic strains are persistent or repeated demands that require readjustments over prolonged periods of time (e.g., managing mental illness; Thoits, 1995). Hassles are minor events that require small daily readjustments (e.g., managing family responsibilities, DeLongis, Folkman, & Lazarus, 1988). Stress reaction is the state of physiological or affective arousal typically produced from the perception of stress. Measuring manifestations of stress can involve assessing self-report measures of perceived stress, as well as physiological changes (e.g., cortisol levels), perceived affect (e.g., measures of anxiety), and exposure to stress (e.g., life event inventories).

1.8.1 Stress and Mental Illness

The link between mental illness and stress is well documented. It has been demonstrated that stressful major life events significantly increase the odds of onset, relapse and exacerbation of psychiatric symptoms in samples of individuals with schizophrenia (for reviews see Anehensel, 1992; Dohrenwend, 2000, Thoits, 1995). Diathesis-stress models are often used to describe the development of MMI. Diathesis-Stress models explain the occurrence of a disorder as the product of the synthesis between hereditary predisposition

(diathesis), and precipitating environmental events (i.e., stress; Zuckerman, 1999). Diathesis is generally considered a genetic or biological predisposition to develop a disorder, but can include cognitive and social predispositions (Monroe & Simons, 1991). In many models, this diathesis includes vulnerability to stress. While the diathesis is a necessary antecedent, its interaction with the potentiating factor stress is required for the individual to become disordered (Zuckerman, 1999). Diathesis stress models have been reformulated to become stress-vulnerability models.

The *stress-vulnerability model* in mental health was introduced as the “common thread” among descriptive and etiological approaches to psychopathology (Zubin & Spring, 1977). According to the model, the intersection of three factors (i.e., biological vulnerability, life stress, and lack of protective factors) can give rise to the onset and progression of psychiatric disorders. A biological vulnerability to mental illness refers to either inborn (i.e., genetic history of illness) or acquired (e.g., substance abuse) factors that increase the risk of becoming mentally ill, and is a necessary antecedent to develop the disorder (Zubin & Spring, 1977). Stress is a response to challenging life events that requires adaptation through assimilation or accommodation. If an individual is confronted by a stressor that exceeds the threshold to adapt, an opportunity is created for mental illness to be triggered or exacerbated given biological vulnerability. While life stress can contribute to mental illness, mental illness itself can contribute to stress. It is reasonable to conclude in light of this framework that those who live with a MMI experience dysfunction in managing stress.

Protective factors, such as effective coping skills, buffer the effect of stress on lowering an individual's resistance to becoming mentally ill. An individual's level of ability to deal with stress varies interpersonally such that what constitutes stress for one person may not be perceived as stressful to another who is more resilient. Zubin and Spring (1977) suggested that periods of major and minor coping breakdown will be experienced by individuals of varying coping abilities over time. These periods of breakdown will be marked by signs of strain (e.g., distress, withdrawal). Those with low biological vulnerability will pass through this period of lowered resistance with little effect. In contrast, those with high vulnerability will experience these periods more frequently and are at risk for vulnerabilities to germinate into expressions of mental illness. Notably, individuals living with MMI are thought to be increasingly vulnerable to the negative effects of stress (Steadman & Ribner, 1982).

Many patients with mental illness who experience stressful life events do not relapse, presumably because they mobilize effective coping responses and have stronger buffering systems. Indeed, individuals who utilize adaptive coping skills seem to manage stress better than those who do not. Effective copers can handle much more stress before they develop symptoms of mental illness (Warner, 1994). Other protective factors empirically demonstrated or theorized to buffer effects of stress on vulnerability include positive appraisal and strong social support (Ventura & Liberman, 2000; Yank, Bentley, Hargrove, 1993).

1.9 Coping

Coping is a psychological process that refers to the way that people deal with stressful life circumstances. Exploration of adaptational processes to stressful situations originated in the 19th century; however, there has been a proliferation of coping research since the 1970's (Lazarus, 1993). Early conceptions of coping with stressful life events emphasized psychoanalysis and defence-focused strategies employed to deal with an individual's experience of anxiety (Freud, 1933). S. Freud popularized the concept of defence mechanisms (e.g., repression, rationalization), which he described as unconscious processes used to distort reality to cope with the experience of distress. A. Freud expanded her father's work, introducing additional defence mechanisms and suggested that individuals may have preferred defensive styles (Somerfield & McCrae, 2000).⁵ Through later theoretical development, psychoanalytic formulations were used to derive a hierarchical conceptualization of coping in which some defence tactics (e.g., projection) were proposed to be healthier and less primitive than others (e.g., repression; Lazarus, 1993). This research was often focused on pathological coping, and was predicated on the evaluation of unconscious processes which were fundamentally difficult to evaluate reliably and validly (Folkman & Moskowitz, 2004; Somerfield & McCrae, 2000). Nevertheless, traces of psychoanalytic theories are present in contemporary theories of coping (Jones & Bright, 2001).

⁵ Early empirical evidence in support of defensive processes was weak (Somerfield & McCrae, 2000), in part, because these processes were difficult to measure and observe (Lazarus, 1993).

Research on coping shifted in the 1970's and 1980's toward cognitive approaches and models of conscious responses to external stressful events that prevail today (Ender & Parker, 1990; Folkman & Lazarus, 1990). Modern models of coping typically embody one of two main approaches: i) the *dispositional* approach, emphasizing relatively stable individual differences in style of coping; or the ii) *situational* approach, concerned with the process of coping throughout and between various situations. This dichotomy is analogous to the state–trait concept popular in the study of other areas of psychology (e.g., anger).

1.9.1 Dispositional View of Coping

The first approach to conceptualizing coping is the dispositional (i.e., trait, style, inter-individual) approach, which assumes that people develop habitual ways of dealing with stress and that these tendencies, or styles, can affect the individual's reaction in new situations (Carver & Scheier, 1994). Research using the dispositional perspective focuses on the effectiveness of particular coping styles in bringing about positive outcomes (e.g., psychological well-being; Jones & Bright, 2001). A specific dichotomy that dominates the literature is the distinction between *avoidant* (e.g., repression, denial) and *approach* (e.g., sensitization, vigilance) methods of coping with stressors.

Investigators have found that personality factors are linked closely with dispositional coping styles. For example, neuroticism is generally linked to increased use of emotion-focused coping, particularly wishful thinking and passivity, and decreased problem-oriented coping (Costa et al., 1996, cited in Jones and Bright, 2001; Hewitt & Flett, 1996). Extraversion is associated with

coping behaviour that involves talking, humour and relating to others (Jones & Bright, 2001). Lazarus (1993) criticized the dispositional approach because it reduced coping to a contrast between two broad opposing styles (i.e., avoidant and approach), arguing that this oversimplification depended on distributional extremes and poorly captured the diverse types of coping strategies people employ under stress.

1.9.2 Situational View of Coping

The second approach to conceptualizing coping is the situational (i.e., state, process, intra-individual) approach and is the framework adopted in the present study. This approach is the most relevant to the proposal that elements of the stress process function as dynamic risk factors because of the inherent assumption that coping is modifiable. Specifically, this view assumes that an individual's coping reactions and strategies can change throughout the duration of a stressful experience and over time (Lazarus & Folkman, 1984). Situational coping highlights the way a person manages stress in different contexts and at various times. Lazarus and Folkman (1984) broadly defined coping as "constantly changing cognitive and behavioural efforts to manage specific external or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141). The reference to 'efforts to manage' suggests that the definition of coping includes strategies that are unsuccessful or that are meant to minimize stressors as well as overcome them (Jones & Bright, 2001).

Individuals generally employ multiple strategies when coping with a major life event or chronic strain. In any single stressful encounter, individuals make use of almost all available coping strategies (Folkman & Lazarus, 1980), though certain individuals may prefer to use certain strategies relative to others. Folkman and Lazarus have demonstrated that stressors appraised as more severe evoke greater numbers of coping responses. Because stressful encounters are complex and comprise many facets, it takes time to explore alternative coping strategies to resolve each facet. Some individuals may engage in a trial and error approach to determine which strategy works most effectively.

1.9.3 Coping Dimensions

Despite whether the conceptualization is dispositional or situational, there is considerable consensus in the literature about the constitution of fundamental coping dimensions. Originally developed by Folkman and Lazarus (1980), *problem-focused* (or approach or task) coping involves strategies aimed at solving the problem, re-conceptualizing the issue, altering the situation, or minimizing its effects (Endler & Parker, 1992, 2002). Problem-focused coping entails identifying a problem, generating and considering alternative strategies, and taking action in an effort to reduce the level of stress associated with the situation. Problem-focused coping is most likely to be used when the individual appraises the situation as controllable and amenable to change (Jones & Bright, 2001). *Emotion-focused* coping is directed at regulating emotions cued by the stressor. Emotion-focused strategies may comprise affective responses, fantasizing reactions, and self-preoccupation (Endler & Parker, 2002). Emotion-

focused coping is a method of thinking that alters the relational meaning of the transaction and is more likely to be used when an individual appraises the situation to be out of their control and not amenable to modification (Jones & Bright, 2001).⁶ The concept of *avoidance coping* is a third general coping dimension frequently discussed in the literature (see Amirkhan, 1990; Endler & Parker, 1990). Avoidance coping may include person- or task-oriented responses and are generally directed at distancing or distracting the person from the stressful situation.

Typically, avoidance (e.g., denial, withdrawal) and emotion-oriented strategies (e.g., blaming others, wishful thinking) are associated with maladaptive outcomes (Moos, 2002). These so-called negative coping strategies consist of behaviours or cognitions that are not focused on resolving the stressor itself. Conversely, people who rely on task-oriented strategies (e.g., problem-solving, seeking information) adapt more successfully (Moos, 2002). These positive coping strategies comprise prosocial approach behaviours focused on self-care or on actively modifying the problem. However, Lazarus (1999, 2000) argued that despite the tendency in the literature to make generalizations about the adaptiveness of styles of coping, there is no universally effective or ineffective strategy because coping success is predicated on the individual, situation, and stage of resolving the event. Lazarus cautioned that although conceptually

⁶ Similarly, people with higher levels of perceived control are more likely to use active, problem-focused coping responses, whereas those with lower perceived control are associated with more avoidant emotion-focused coping. Sense of control directly reduced psychological disturbance and buffers effect of stress on negative outcomes (for a review see Turner & Roszell, 1994).

different, it may be misleading to separate coping styles when it comes to effectiveness because they are interdependent and work together.

1.9.4 Coping and Mental Illness

Most of the research examining coping behaviour among psychiatric populations has focused on strategies for dealing with psychotic symptoms rather than stressful life events (Carr, 1988; Carter et al., 1996; Wiedl & Schottner, 1991). While some research has found that those with MMI use the same range of coping responses (i.e., cognitive and behavioural) in response to stressors as are utilized among the general population (Brenner, Boker, Muller, Spichtig, & Wurgler, 1987; Burton, Chaneb, & Meeks, 2007; Middleboe & Mortensen, 1997), other researchers suggest that those with MMI are impaired in their ability to acquire and employ effective coping strategies (MacDonald, Pica, McDonald, Hayes, & Baglioni, 1998). There is some evidence that people with MMI tend to demonstrate *diminished* problem-solving abilities, opting to rely more heavily on avoidance coping (Jansen, Gispen-De Wied, & Kahn, 1999; Jones & Bright, 2001; van de Bosch & Rombouts, 1997). Reduced use of problem-solving strategies among this population may be due to the lack of available coping resources relative to others, such as decreased social support (Hultman, Wieselgren, & Ohman, 1997). Strous, Ratner, Gibel, Ponizovsky, and Ritsner (2005) found that social support predicted greater use of task-oriented and avoidance strategies.

A high prevalence of individuals with persistent MMI use religious coping strategies (e.g., praying, meeting with a spiritual leader; Burton et al., 2007) and

reported that religious coping was useful in dealing with symptom severity and daily difficulties (Tepper, Rogers, Coleman, & Malony, 2001). Inpatients typically perceive their situation as relatively unchangeable, and tend to rely on emotion-focused strategies (Turner & Roszell, 1994). However, behavioural strategies (Boschi et al., 2000) and seeking social support (Lee, Lieh-Mak, Yu, & Spinks, 1993) have been found to be most beneficial in leading to better psychosocial functioning.

The experience of severe psychiatric symptoms is associated with using a greater number of coping strategies to resolve stress (Boschi et al., 2000); however, these strategies are generally reported to be ineffective. Exacerbation of psychiatric symptoms is related to using less active and planful coping (Meyer, 2001) and more emotion-oriented coping (Strous et al., 2005). The experience of less severe symptoms is related to using more behavioural and planful problem-solving strategies (Folkman, Lazarus, Gruen, et al., 1986; Boschi et al., 2000; Middleboe & Mortensen, 1997). Some researchers have noted that “symptoms” of schizophrenia may themselves reflect coping strategies (e.g., disorganized behaviour may reflect efforts to control intrusive thoughts (van den Bosch & Rombouts, 1997).

1.9.5 Gender and Coping

Recent research supports that gender may moderate the stress process, suggesting that men and women respond to the experience of stress in different ways. Based on research in biobehavioural health, it has been argued that males respond to stress with a traditional “fight or flight” response, whereas women

respond to stress with “tend and befriend” behaviours characterized by nurturing activities and the development of social networks (Stroud, Salovey, & Epel, 2002; Taylor et al., 2000). This gendered coping appears to extend to the MMI population. Teasdale, Silver, and Monahan (2006) found evidence that men and women cope differently with delusional beliefs. Based on an analysis using data from the MacArthur Violence Risk Assessment Study, Teasdale and colleagues found that when males experienced threat delusions, they were more likely to perpetrate violence compared to when they did not experience such delusions. On the contrary, women were *less* likely to commit violent acts when they experienced a threat delusion than when they were free of such symptoms.

1.10 Negative Affect

State-trait theory of affect has underscored both the variability and stability of human affect (Spielberger, 1972, Egloff, Schmukle, Burns, Kolhmann, & Hock, 2003). Trait-oriented emotional tendencies are presumed to be stable and enduring, forming the foundation of an individuals' long-lasting emotional experience. Alternatively, state-dependent affect fluctuates over time based on a person's immediate experience (Kraemer, Gullion, Rush, Frank, & Kupfer, 1994). There are two main traditions in emotion research: i) conceptualization of emotions as specific and distinct moods (Egloff et al., 2003; Plutchik, 1994) and ii) approaches that emphasize a small number of broad underlying dimensions that produce systematic relationships between fundamental emotions (e.g., Watson & Tellegen, 1985). The typical dimensional scheme comprises two factors: positive affect (PA) and negative affect (NA) (Watson, Tellegen, 1985).

According to this framework, PA refers to the degree of positive mood or pleasantness experienced, including feelings of joy, enthusiasm, interest and alertness. On the contrary, NA refers to a broad dimension of emotional distress and unpleasurable engagement that includes aversive moods such as fear, sadness, anger, guilt, and contempt (Watson & Clark, 1984; Watson & Tellegen, 1985). NA (Harmon-Jones, 2000) and mood (Benedict, Dobraski, & Goldstein, 1999) typically change over intervals of weeks.

1.10.1 Anger

While the present study focuses on negative mood states, one particular form of NA is especially relevant to the outcomes under study: anger. Anger is understood as a subjective emotional state defined by the presence of physiological arousal and antagonistic cognitions (Novaco, 1994). The state of anger is a normal emotion serving many adaptive functions, and is not inherently dysfunctional. Anger becomes problematic when it is not appropriately expressed or controlled (Novaco, 1994). Novaco conceptualized anger as an affective and cognitive reaction to provocation that is based on the nature of the situation, expected outcomes, and coping style. Thus, anger can be thought of as a response to aversive events.

Aggression, particularly reactive aggression, is often accompanied by strong negative emotional states. While anger and associated affective factors (e.g., hostility) have been modeled as dispositional in nature (Novaco, 1994), the intensity of anger and its manifestation can be dynamic. Anger has been an under-investigated construct as a predictor of violence compared to other

negative emotions, such as anxiety and depression, despite widespread acknowledgement of the central role anger plays as a determinant of individual and collective violence and as a significant component of many psychiatric syndromes (Novaco, 1994). Indeed, dispositional negative affectivity is a key feature of many mental and personality disorders (e.g., schizophrenic disorders, affective disorders such as depression, ASPD; DSM-IV-TR, 2004).

According to Novaco (1994), anger arousal is cognitively mediated, in that there is no direct relationship between external events and anger; arousal and perpetuation of anger is based on perception and information processing. An antagonistic impulse is regulated by internal and external inhibitory mechanisms which can be overridden by disinhibitory factors (e.g., contextual cues for aggression, heightened arousal, substance misuse). The manner in which an angry person behaves in the face of provocation depends on a number of social learning factors (e.g., modeling influences, expected outcomes, reinforcement contingencies).

1.11 Theoretical Support for Elements of the Stress Process as Predictors of Violence and Victimization

There are a number of criminological, psychological and sociological theories that postulate a link between elements of the stress process and adverse outcomes such as violence and victimization. Agnew's (1992) Strain Theory, Frustration-Aggression Models (Berkowitz 1990; Dollard, Doob, Miller, Mowrer, & Sears, 1939), and the Social Interactionist Approach (Felson, 1992) all

propose that stress, poor coping, or negative affect can increase the likelihood of violence or victimization. These theories are described below.

1.11.1 Strain Theory

Strain theory was originally formulated during the 1930s by Robert Merton and has seen many refinements over time (see Cloward & Ohlin, 1960; Cohen, 1955). The basic premise inherent to Strain Theory is the notion that individuals do not normally commit crime except when external circumstances place them in an unpleasant situation. While people aspire to be law-abiding, encountered obstacles and unattained goals create strain that compel people to behave deviantly in an effort to alleviate that strain (Miller, Schreck, & Tewksbury, 2006). Sometimes an individual will behave violently in order to reduce the experience of strain.

Agnew's General Strain Theory (1992) is the most current reformulation of the strain theories in which he expanded the sources of strain to three causes. First, strain may be caused by the failure to achieve positively valued goals in which there is disjunction between i) aspirations and expected level of goal achievement; ii) expectations and actual achievements; and iii) self-perceived "fair" outcomes and actual outcomes. Second, strain may be caused by the removal of positively valued stimuli from the individual, for example, when privileges are taken away. The loss (or anticipated loss) of positively valued stimuli may lead to delinquency as the individual tries to prevent or retrieve the loss, obtain a substitute, or seek revenge against the source of the stimuli's removal. Third, strain may be caused by exposure to aversive stimuli, such as

being taunted. Deviant behaviour may be used in efforts to escape or avoid the aversive stimuli, end the stimuli, or seek revenge against the source of the stimuli. Agnew proposed that individuals who are stressed are more likely to experience negative moods (e.g., anger, frustration) that subsequently created subjective pressure for “corrective action.” Agnew postulated that this pressure for action was likely to compel aggressive behaviour when violence was viewed as a viable path to goal attainment, or as a form of retribution directed toward those perceived as being responsible for causing strain.

Notably, Agnew (1992) outlined three coping strategies to deal with strain: i) cognitive coping strategies which involve reinterpreting the situation as less threatening; ii) behavioural coping strategies in which action is taken to manage the source of strain; and iii) emotional coping strategies designed to neutralize unpleasant affect from strain. Strain leads to delinquent reactions when: i) strain impacts issues of personal importance; ii) the individual possesses poor coping skills and resources; iii) there is a lack of social support; iv) the benefits of deviant behaviour are high and risks are low; and v) the individual is predisposed to delinquency. Overall, Agnew suggested that the experience of strain paired with perceiving violence as a means for goal acquisition or “righting” a perceived incongruity produces a potential pathway to violence, particularly when personal stakes are high and availability of coping resources are low.

1.11.2 Frustration-Aggression Hypothesis

Ostensibly, angry, frustrated, distraught people have long been regarded as being prone to aggression. The notion that frustration evokes aggression is a

long-standing hypothesis. Dollard et al. (1939) postulated that the likelihood of aggressive behaviour increases when an external event impedes goal pursuit, particularly when the goal is personally significant or when frustration is repeatedly experienced. According to the original theory, interference in goal pursuit produces aggressive energy that is released through violent acts toward the source of frustration, or displaced against other people. This model has been criticized because it cannot account for alternative (i.e., adaptive) responses to frustration, nor explain instrumental violence that is unrelated to thwarting (Miller, 1941).

Berkowitz (1990) later reformulated the Frustration-Aggression Hypothesis. In the Cognitive Neo-Associationistic model Berkowitz argued that aversive events in general instigate aggression because they produce negative affect (e.g., psychological distress, anxiety, anger, annoyance, pain). The model assumes that associative networks link particular types of feelings with particular thoughts and memories, and particular expressive behavioural and physiological reactions. The activation of one part of the component activates other parts of the network. In this model there is an associative connection between NA and anger-oriented mood, cognitions, memories, and with aggressive inclinations. Thus, if a person feels negative, for example, due to goal blockage, they are more likely to be angry, have hostile thoughts, and be aggressively predisposed. Berkowitz suggested that NA resulting from exposure to an aversive occurrence triggers two sets of associated thoughts and reactions: those associated with escape from the unpleasant situation (flight), and those associated with aggression

(fight). Whether fight or flight occurs depends on a number of genetic, learned and situational factors including how the situation is appraised, and how emotions are examined and controlled in light of the cognitive associations brought to mind.

1.11.3 Social Interactionist Approach

Felson (1992) predicted that during times of stress an individual is at greater risk of victimization and violence due to the role of social control processes. Felson argued that stress indirectly leads to aggression through its effect on the individual's social behaviour. That is, individuals under stress are more likely to violate expectations, perform less competently, and annoy others. Moreover, individuals experiencing stress often fail to engage in proper social interaction rituals. Basic rules of social interaction stipulate polite and friendly exchange; however, people who are distressed may lack resources to perform these rituals well. Individuals under stress may find it challenging to feign positive emotions, or show deference, resulting in behaviour others may find inappropriate, irritating, or aggressive. Felson argued that when others perceive a rule violation, they express their grievance by attempting to socially control the rule violator by admonishing and/or punishing them. The rule violator in turn may respond with retaliation or escalation in order to achieve justice, save face, or ward off future attacks. While either member might aggress first, Felson suggested that the aggrieved individual tends to strike first. Thus, according to the Social Interactionist approach, the experience of stress increases the risk for victimization as well as violence perpetration.

1.12 Empirical Support for Elements of the Stress as Predictors of Violence and Victimization

1.12.1 Stress

There is empirical support that suggests that exposure to stress increases the likelihood of violent behaviour. Stress, as measured through life event scores, has been found to be correlated with criminal activity (Masuda, Cutler, & Holmes, 1978) as well as violent behaviour (Levinson & Ramsay, 1979). Steadman and Ribner (1982) reported a relationship between violence and increased life stress among a sample of psychiatric patients, but not among the general public. Moreover, challenges relevant to the experience of mental illness, such as unemployment (e.g., Loeber & Dishion, 1983; Klassen & O'Connor, 1989) and family-oriented stress (e.g., Klassen & O'Connor, 1988) have been shown to be related to violence.

To date, two studies have explored whether stress contributes to the association between mental illness and violence. Monahan and colleagues (2001) reported that perceived stress increased the odds of violence perpetration among psychiatric patients in the first year after discharge from hospital ($OR = 1.23$). Analysing data from the National Institute of Mental Health's Epidemiological Catchment Area surveys, Silver and Teasdale (2005) found higher levels of stressful life events among individuals who were both living with mental illness and who committed violence. Notably, they also found that the relationship between mental illness and violence was significantly reduced when stressful life events were statistically controlled. Umberson, Williams and Anderson (2002) suggested that violence is a behavioural expression of

psychological distress that is characteristic of people who tend to suppress emotion and appraise situations as threatening.

There is currently little research that examines stress as a predictor of victimization. In a recent analysis of data from the Macarthur Violence Risk Assessment Study, Teasdale (2009) conducted one of the only studies that has empirically tested this association. While he did not find a main effect of stress on the incidence of victimization among those with MMI, he did find that gender moderated this relationship such that stress elevated the likelihood of victimization among men, but not for women.

1.12.2 Coping

Similarly, there is a paucity of empirical research investigating the relationship between coping and violence. A single study conducted by Scarpa and Hadden (2006) found that greater use of avoidant and emotion-focused coping predicted higher aggression scores among a sample of university students. Several researchers have suggested that coping may function as a mediator between stress and outcome (e.g., Boekaerts, 1996; Lazarus, 1993). Thus to the extent that stress is related to violence, a failure in coping to alleviate stress may be a risk factor for violence. Deficiencies in coping may include a failure to adopt coping strategies that are effective in dealing with stressful situations, possibly with an over-reliance on a certain type of strategy (e.g., avoidance, emotion-focused), poor coping competence, and limited coping resources. Indeed, research suggests that factors, such as a lack of coping resources (e.g., social support), can predispose an individual to be more

vulnerable to the effects of stress (Silver, 2000), and by extension adverse outcomes. Two models of aggression suggest that individuals with limited problem solving abilities have a greater likelihood of viewing self-harm (e.g., Bonner, 1992) or violence (Korn, Botsis, & Kotler, 1992) as feasible means of coping with intolerable distress.

Kotler, Finkelstein, Molcho, et al. (1993) examined the correlates of violence and suicide risk in a sample of psychiatric inpatients and found that coping styles were a better predictor of violence risk than of suicide risk. Three coping styles were identified to correlate negatively with violence risk: replacement (i.e., finding alternate solutions to the problem), reversal (i.e., acting opposite to the way one feels) and mapping (i.e., collecting information about the situation). The empirical association between coping and victimization is understudied. Among college students, maladaptive coping strategies predicted sexual revictimization (Filipas & Ullman, 2006). Carmen et al. (1984) found that among psychiatric patients chronic victimization was related to difficulty coping with anger and aggression during hospitalization, and that women directed aggression inward and men outwards. Thus the few studies that have investigated this association suggest that there is support for an empirical link between poor coping and victimization.

1.12.3 Negative Affect

Empirically, Rice, Harris and Quinsey (1994) noted that despite staff reporting that a patient's violent episodes arose for no reason, patients themselves report that most of their assaultive behaviour occurred as a reaction

to teasing, provocation, receiving an order or being denied a request; all of which could evoke a frustration-anger response. Whittington and Wykes (1996) found that 86% of assaults committed by psychiatric patients on ward staff were immediately preceded by the staff member engaging in frustrating, demanding, or intrusive behaviours. Consistently, Whittington and Richter (2005) reported that many of violent acts engaged in by psychiatric inpatient were the result of some form of frustrating staff-patient interaction or rule imposition by staff.

Douglas and Skeem (2005) postulated that mood and NA might be associated with aggressive behaviour because these constructs impact and are influenced by behaviour and cognition which may include negative/hostile cognitions about self and others. Crocker et al. (2005) found that NA, as well as ASPD, thought disturbance, and earlier age at psychiatric hospitalization was associated with prospective community violence in dually diagnosed outpatients over a three year follow-up period. While there is empirical support for the propensity of men to externalize NA through violent behaviour as a response to stress relative to women (e.g., Taylor et al., 2000), this gender difference does not hold up in the context of samples with major psychiatric disorders where no differences between men and women with respect to rate of aggression has been consistently found (e.g., Monahan et al., 2001; Stueve & Link, 1998).

Situational anger has been associated with increased likelihood of aggression (Harmon-Jones & Sigelman, 2001; Ritsner, Modai, Gibel, et al., 2003). Anger is a risk factor for violence among populations of civil and forensic psychiatric patients. Monahan and colleagues (2001) found that among several

hundred discharged psychiatric patients, patients with higher levels of anger pre-hospital release (as rated by the Novaco Anger Scale) were twice as likely to engage in community violence one year post-hospitalization compared with those with lower scores. Novaco (1994) found a moderate association between retrospective violent criminality and anger in a sample of civil psychiatric patients. Anger was a predictor of prospective assaultiveness among male forensic patients during an 18 month follow-up (Novaco & Renwick, 1998). Similarly, anger and active psychiatric symptoms predicted reactive aggression in hospital (i.e., arising from provocation, as opposed to instrumental aggression which is planful and goal directed) among male forensic inpatients (Vitacco, Van Rybroek, Rogstad, Yahr, Tomony, & Saewert, 2009). Kay, Wolkenfeld, and Murrill (1988) found that among a sample of psychiatric inpatients, anger was highly related to physical violence. Craig (1982) found that among 876 male psychiatric inpatients, aggression was linked to emotional turmoil as manifested by agitation and anger among patients with schizophrenic, alcoholic, and organic brain syndromes. However, males with other diagnoses showed aggression in the absence of substantial emotional distress, and patients with affective disorders were unlikely to exhibit aggressive behaviour even when high levels of agitation and anger were reported.

Posternak and Zimmerman (2002) argued that there are contrary results yielded in research examining the relationship between anger, aggression, and other forms of NA. They found that among 1300 psychiatric outpatients (62.2% diagnosed with an affective disorder), over half experienced at least moderate

levels of anger (i.e., often aware of feeling quite angry or occasionally feeling very angry) and one quarter experienced at least moderate levels of aggression (i.e., often shouts, loses temper). They found that generalized anxiety disorder as well as Axis I disorders associated with subjective anger (e.g., Intermittent Explosive Disorder, Bipolar Disorder, Post Traumatic Stress Disorder) was associated with increased rates of aggression.

With respect to victimization, the immediate and long-term experience of NA (e.g., distress, anxiety) as a result of victimization is well validated (see Chapman, Dube, & Anda, 2007 for a review). However, there is a lack of research examining the effect of NA on the odds of prospective victimization. There are no studies known to the author at this time that investigates this association that could be reported for the present study.

Taken together, to the extent that individuals with mental illness experience disproportionately high levels of violence and violent victimization, it is vital to identify independent risk factors for these harmful outcomes in order to reduce their occurrence. Constructs that comprise the stress process as described in the Transactional Model of stress and coping are promising potential risk factors that warrant investigation given the theoretical and known empirical associations described above. The constructs of stress, coping, and NA are particularly attractive factors to explore given their dynamic nature and ability to be targeted for intervention.

1.13 Purpose of the Present Study

The purpose of this study was to examine among those with MMI whether: i) baseline levels of stress, coping, and NA were associated with post-hospitalization violence and victimization; ii) gender moderated these associations; iii) coping was a mediator of stress as a predictor of violence and victimization, and iv) predictors were associated with time to event. Given that some risk factors have been reliably established in the research literature, there was an interest in testing the effect of stress, coping, and NA beyond the effect of psychopathy, problematic substance use and TCO delusions for violence outcomes, and problematic substance use, social support and TCO delusions for victimization outcomes.

1.13.1 Hypotheses

Specifically, the hypotheses were as follows:

1) Higher levels of stress, increased use of maladaptive coping styles (avoidant, emotion-focused), coping failure, and higher levels of negative affect will be predictive of prospective violence after controlling for relevant covariates.

Relatedly, it was further hypothesized that coping competence and task coping will be associated with engaging in violence less often.

2) Higher levels of stress, increased use of maladaptive coping styles (avoidant, emotion-focused) and coping failure, and higher levels of negative affect will be predictive of prospective victimization after controlling for relevant covariates. Similarly, coping competence and task coping will be related to less victimization.

- 3) Gender will moderate the association between coping and outcomes. Because males are thought to be more likely to engage in fight or flight strategies when stressed, coping failure of males will be particularly detrimental with respect to violence and victimization relative to females who are more likely to engage in “tend and befriend” strategies when distressed.
- 4) Coping ability will mediate the effect of stress on the adverse outcomes under study.
- 5) Increased levels of stress, maladaptive coping (emotion and avoidant coping), NA and anger will be associated with faster involvement in violence and victimization. Perceived coping and task-oriented coping will be related to delayed instances of violence perpetration and victimization.

2: METHOD

2.1 Participants

The sample consisted of 74 civil psychiatric patients admitted to an emergency ward of an urban hospital with a psychiatric facility in British Columbia. Of this group, six did not complete the baseline interview and three did not complete the baseline self-report measures; also, there was no follow-up data for these nine participants. Among the 64 participants for whom complete baseline data was collected, follow-up data was available for 53 participants (86.5%).

The sample measured at baseline was evenly split between gender, relatively young (Mean age = 36.06, $SD = 11.09$), mostly Caucasian (85.3%), high school educated (Mean years of education = 12.51, $SD = 2.36$) and single (see Table 1 for summary of demographics). The most common type of admission diagnosis among participants was Mood Disorder (52.7%), Schizophrenia and other Psychotic Disorders (50%) and Substance-Related Disorders (20.3%).⁷ Sixteen percent of the sample was diagnosed with a personality disorder. Three quarters of the sample was involuntarily admitted to hospital (75%). The most common reason for admission was risk of harm to self (75%), followed by risk of psychiatric deterioration (60%). About 18% of the sample was committed for the protection of others. A lifetime history of engaging

⁷ The three most recent diagnoses at admission were measured for each participant. Each diagnostic category was dummy coded for presence/absence.

in violence, including violence in hospital, was reported by 63.5%. Seventy percent reported a lifetime history of victimization.

Table 1: Sample Demographics for Baseline Sample (N=74)

	N	Percent
<i>Gender</i>		
Male	34	50
Female	34	50
<i>Ethnicity</i>		
Caucasian	58	85.3
Asian	8	11.8
Aboriginal	1	1.5
Other	1	1.5
<i>Age</i>		
19-29	25	36.8
30-39	15	22.1
40-49	20	29.4
50-59	7	10.3
60-69	1	1.5
<i>Education (Years)</i>		
Less than 12	15	30
12 or more	35	70
<i>Marital Status</i>		
Never Married	36	52.9
Separated /Divorced	16	23.5
Widowed	1	1.5
Married/Common Law	15	22.1
<i>Admission Status</i>		
Voluntary	17	25
Involuntary	51	75
<i>Admission Diagnosis</i>		
Depression	20	27.0
Bipolar Disorder	16	21.6
Schizophrenia	10	13.5
Substance Use Disorder	15	20.3
Personality Disorder	12	16.2

Note. Demographic information was missing for six participants for all demographic variables except education, for which data was missing for 24 participants.

2.2 Procedure

This study represents a subcomponent of a larger prospective study investigating various dynamic risk factors among civil psychiatric patients discharged to the community. Ethical approval was granted from Simon Fraser University Research Ethics Board to conduct secondary data analysis of data collected from the larger study. The following describes the procedure of the larger study as it relates to the present study.

Convenience sampling (i.e., non-probability sampling in which the sample is drawn from that part of the population of interest that is close in proximity) was used to recruit participants in the study. To be eligible for study inclusion patients met the following criteria: i) were aged 18 or over; ii) met DSM IV-TR criteria for a MMI, iii) spoke English fluently; iv) discharge from hospital was imminent; and v) were willing and capable of providing informed consent to the study. Individuals diagnosed with moderate to profound mental retardation were excluded from recruitment. Patients who met the inclusion criteria were identified by hospital staff who queried patients about whether they were interested in participating in a research study and would consent to being approached by the research team. Staff informed the research staff of the potential participants who assented to being approached. Members of the research team approached the identified patients individually at the hospital to provide a description of the study and offer an invitation to participate. In this initial meeting, the investigator orally reviewed a description of the study and the consent form with the potential participant. Given that the sample comprised patients who were potentially compromised due

to their mental health status, participants were asked to complete a brief multiple-choice questionnaire to assess sufficient comprehension of the study's nature and information presented in the consent form. Additionally, oral assent was sought from the attending psychiatrists validating that the participant was capable of providing consent and undue distress would not be experienced by the individual from participating in the study.

2.2.1 Baseline and Follow-Up Interviews

Enrolled participants completed a baseline evaluation conducted at the hospital, as well as five follow-up assessments approximately every four weeks. An attempt was made to schedule the follow-up evaluations to concur with the participants' regularly scheduled appointments at community clinics. At the baseline evaluation, participants completed an interview and a series of self-report measures in an individual setting with the primary investigator or research assistant. The baseline interview was designed to assess: i) demographic information (e.g., age, gender, marital status, ethnicity, education); ii) psychiatric symptoms; iii) mental health history; iv) history of substance use; v) history of violence and victimization, and vi) a further assessment of static and dynamic risk factors for violence and victimization. Five additional follow-up interviews were conducted with the participant in the community in order to re-evaluate dynamic factors and dependant variables. Participants were thanked and compensated for their participation after each interview.

2.2.2 Study Completion

Of the 64 participants who completed the baseline assessment (i.e., both interview and self-report questionnaires), 28 participants completed all five follow-up interviews (43.8%). Of the 36 with partial follow-up data, 12 are currently completing the study, 15 were lost because they could not be reached, eight withdrew from the study and one moved out of the province. At least one follow-up interview was completed by 53 participants (82.8%). Table 2 describes the number of participants who completed each follow-up. The average follow-up time was 142.92 days ($SD = 64.32$).

Table 2: Completion Rates of Individual Follow-Up Waves

Wave	N	Percent
5	28	43.8
4	35	54.7
3	38	59.4
2	42	65.6
1	53	82.8
Baseline	64	100.0

2.2.3 Attrition

The attrition rate in the present study (17.2%) is comparable to those reported in similar multi-wave studies (e.g., 16.3% reported in Steadman et al., 1998). Compared with patients in the follow-up sample, enrolled participants who were lost to follow-up did not differ in terms of level of psychopathy ($t(61)=-0.44$, $p>.05$) or problems with alcohol ($t(60)=-0.28$, $p>.05$) or drug use ($t(60)=-0.76$, $p>.05$).

2.3 Measures

Table 3 displays the interview-based and self-report measures that were administered at baseline and follow-up assessments. Measures are grouped in the following sections: Stress, Coping, Negative Affect, Violence and Victimization, and Covariates. Covariates discussed below were selected based on both theoretical and empirical grounds. Selected measures are shown in the Appendix.

2.3.1 Stress Measurement

The following two measures were used to operationalize stress. These measures were assessed at baseline.

Perceived Stress Scale (PSS-10)

The PSS-10 (Cohen and Williamson, 1988) is a 10-item self-report instrument that measures the degree to which situations in one's life are appraised as unpredictable, uncontrollable, and overwhelming. Participants are asked to indicate on a 5-point Likert scale (0 = *Never*, 4 = *Very Often*) how often they felt or thought a certain way during the past month (e.g., "*How often have you felt you were on top of things?*"). Higher scores indicate greater levels of perceived stress. This scale has demonstrated acceptable internal reliability ($\alpha = .78$; Cohen & Williamson, 1988), and has been used among psychiatric samples (Monahan et al., 2001). The PSS-10 has good concurrent validity correlating ($r = .62$) with the Daily Stress Inventory (Machulda, Bergquist, & Ito, 1998). In the present study, the PSS-10 demonstrated high internal reliability ($\alpha = .815$).

Table 3: Baseline and Follow-Up Assessment Protocols

BASELINE ASSESSMENT		FOLLOW-UP ASSESSMENT	
Interview	Self-report	Interview	Self-report
MacArthur Violence Instrument (participant version)	Perceived Stress Scale-10 Hassles and Uplifts Scale	MacArthur Violence Instrument (participant version)	Perceived Stress Scale-10 Hassles and Uplifts Scale
Hare Psychopathy Checklist: Screening Version	Coping Inventory of Stressful Situations	Hare Psychopathy Checklist: Screening Version	Coping Inventory of Stressful Situations (state evaluation only)
TCO items	Perceived Coping Competence and Efficacy Assessment Interpersonal Support Evaluation List Positive and Negative Affect Schedule State-Trait Anger Expression Inventory-2	TCO items	Perceived Coping Competence and Efficacy Assessment Interpersonal Support Evaluation List Positive and Negative Affect Schedule
	Michigan Alcohol Screening Test		State-Trait Anger Expression Inventory-2 (state evaluation only)
	Drug Abuse Screening Test		Michigan Alcohol Screening Test
			Drug Abuse Screening Test

The mean score for perceived situational stress assessed over the past week, was 22.29 ($SD = 6.43$). This score was significantly higher than reported community norms ($M = 13.02$, $SD = 6.45$, Cohen & Williamson, 1988) indicating that sampled discharged patients with MMI have greater levels of perceived

stress than individuals without MMI. Women perceived higher levels of stress compared to men [$t(59) = 2.23, p < .05$; $M_{\text{Females}} = 24.21 (SD = 7.06)$, $M_{\text{Males}} = 20.66 (SD = 5.31)$, respectively]. This finding is consistent with other studies of normative populations (e.g., Cohen & Williamson, 1988; Remor, 2006).

Hassles and Uplifts Scale (HSUPS)

The HSUPS (DeLongis et al., 1988) is a 53-item self-report measure that assesses the degree of negative and / or positive effect of daily minor life transactions (e.g., *Time spent with family*). Participants are asked to rate on a 4 point Likert scale (0 = *None or Not Applicable*, 3 = *A Great Deal*) the degree to which a given transaction is a hassle (i.e., annoying or bothersome) and an uplift (i.e., brings joy or gladness). The instructions for the rating period were modified from “*daily*” to “*during the past week*”. Ratings are summed so that a total score is calculated for Hassles and Uplifts separately. The present study was only interested in the Hassles Scale. Adequate internal validity of the scale has been reported in other studies ($\alpha = .71$; Lu, 1991). In the present study, the HSUPS-Hassles scale demonstrated high internal reliability ($\alpha = .895$).

The mean the HSUPS-Hassles Scale was 37.62 ($SD = 19.75$) was found. This mean is significantly higher than the reported normative mean based on married couples ($M = 16.26, SD = 10.87$; DeLongis et al., 1988). Daily hassles did not differ between gender [$t(59) = 1.00, p > .05$].

2.3.2 Coping Measurement

Two indicators of coping were assessed at baseline.

Coping Inventory for Stressful Situations-Situation Specific Scale (CISS-SSC)

The 21-item CISS-SSC (Ender & Parker, 1999) was administered to assess the ways individuals react and cope with a specific situation. The instrument is comprised of three seven- item scales assessing three types of coping: emotion-oriented coping (e.g., *become very upset*); task-oriented coping (e.g., *analyze my problem before reacting*); and avoidance (e.g., *visit a friend*). Participants were asked to identify the most stressful event or situation they encountered over the past four weeks and then to complete the CISS-SSC based on their reaction to that event. Responses are scored on a 5-point Likert scale (1 = *Not at all*, 5 = *Very much*). Higher scores on each of the three scales indicate greater use of the particular style of coping. The CISS was constructed on both clinical and non-clinical samples and has demonstrated high reliability as well as convergent and concurrent validity (McWilliams, Cox, & Enns, 2003; Ritsner, Modai, Endicott, et al., 2000). The CISS has been used with schizophrenic outpatient samples and has demonstrated high internal consistency among samples of discharged psychiatric patients ($\alpha = .84 - .95$; Strous et al., 2005).

At baseline, the mean score for the Task scale was 22.20 ($SD = 5.78$), for the Emotion Scale was 21.95 ($SD = 7.40$), and was 17.93 ($SD = 6.22$) for the Avoidance Scale. Compared to adult normative sample means for the scales for a General Stress Scenario [Task = 25.86 ($SD = 4.63$); Emotion = 18.95 ($SD = 6.03$); Avoidance = 18.60 ($SD = 5.72$); Endler and Parker, 1999], the present sample used less Task coping, more emotion-oriented coping and similar

avoidance coping. All CISS-SSC scales demonstrated adequate reliability ($\alpha = .708 - .862$). Males demonstrated higher levels of task coping relative to females ($t (58) = 2.34, p < .05$), and females demonstrated greater levels of emotion oriented coping compared to males ($t (48) = 2.12, p < .05$). There were no differences between gender with respect to engaging in avoidance coping styles ($t (58) = 0.22, p > .05$). Table 4 displays CISS-SSC scale means by gender.

Table 4: Mean CISS-SSC Scores by Gender

CISS-SSC Scale	Gender	Mean	SD
Task Scale	Male	23.47	5.49
	Female	20.07	5.73
Emotion Scale	Male	20.06	5.94
	Female	24.07	8.30
Avoidance Scale	Male	17.84	6.11
	Female	18.18	5.94

Note. CISS-SSC = Coping Inventory for Stressful Situations - Situation Specific Scale

Perceived Coping Competence and Efficacy Assessment (PCCEA)

The PCCEA was developed for the purpose of this study and consisted of two parts. For Part A, respondents were asked to describe in their own words the most stressful event or situation that they encountered over the past four weeks (i.e., the same stressful situation assessed for the CISS-SSC). Next, participants were asked to name up to five strategies they used to resolve the situation and then rate on a five point Likert scale (1 = *Not at all Effective*, 5 = *Very Effective*) how effective the strategy was in dealing with the situation. In Part B of this assessment, respondents answered eight questions about their perceived coping

ability and effectiveness in responding to the described situation (e.g., *I handled the situation well given the circumstances*) by rating their agreement on a 5 point Likert scale (1 = *Very Much Disagree*, 5 = *Very Much Agree*). Items 3 and 6 were reverse scored. Higher scores were indicative of greater perceived coping ability / effectiveness.

Because this measurement was experimental, it was of interest to determine whether the eight items could be considered together as a scale as opposed to treating each item separately for planned analyses. Stevens (1992) recommends that components with four or more loadings above |.60| are reliable regardless of sample size; thus, despite the small sample size of the present study, Principle Components Analysis (PCA) was considered to reduce the data to a smaller number of underlying components for subsequent analysis. First, the correlation matrix of the eight items was examined to determine whether PCA was warranted. All but one bivariate correlation coefficient was statistically significant, thus all eight variables were entered into a PCA. Prior to analysis, two outliers were eliminated. Outliers were identified by deriving the Mahalanobis distances⁸ and comparing them to a χ^2 distribution critical value at the $\alpha = .001$ level with degrees of freedom equal to the number of variables investigated (i.e., eight variables; Mertler & Vannatta, 2005). Distances that were greater than the critical value ($\chi^2_{\text{crit}} = 26.125$) were deemed outliers and excluded from the analysis. The PCA produced a one-component solution, which was confirmed

⁸ Mahalanobis distance is the distance of a case from the centroid of the remaining cases where the centroid is the point created by the means of all the variables.

based on Kaiser's Rule⁹ (1960, cited in Nunnally & Bernstein, 1994) and evaluation of the Scree plot. The component accounted for 55.08% of the total variance in the original variables. Table 5 presents the component loadings. Scores on each variable were aggregated to generate a total score. The PPCEA-Part B had good reliability ($\alpha = .858$). The mean PCCEA-B score measured at baseline was 24.94 ($SD = 7.54$). Perceived coping competence did not differ between males and females [$t (58) = 1.35, p > .05$].

Table 5: Component Loadings for PCCEA-B

Item	Coping Competence Component
1. I felt that I had many resources (e.g., support, time) at my disposal to deal with the situation	.619
2. The strategies I used were effective in resolving the situation	.872
3. I could not find a way to reduce the feeling of stress caused by the situation	.659
4. I was satisfied with how I handled the situation	.841
5. I was very good at using the strategies I chose to deal with the situation	.879
6. I was unable to find a way to solve the problem	.518
7. I was confident that I would be able handle the situation	.624
8. I handled the situation well given the circumstances	.830

2.3.3 Negative Affect Measurement

Two instruments of negative affect were measured at baseline.

⁹ Kaiser's Rule recommends that only components with eigenvalues greater than 1 should be retained.

Positive and Negative Affect Schedule (PANAS)

The PANAS (Watson, Clark, & Tellegen, 1988) is a 20-item self-report measure that comprises adjectives that describe positive (e.g., excited, active) and negative (e.g., distressed, hostile) emotional states. Participants rated each adjective using a five-point Likert scale, where 1 indicates that the adjective applies to the individual slightly or not at all, and 5 indicates that the adjective applies to an extreme extent. Participants were asked to respond to this measure indicating how they felt during the past four weeks, including today. The PANAS has good internal consistency ($\alpha = .87$ for NA, $.87$ for PA; Watson, Clark, & Tellegen, 1988). Higher scores on each of the positive and negative scale indicate greater levels of that emotional state. Only the Negative Scale was used in the present study.

Mean PANAS Negative Affect scale score was 27.94 ($SD = 8.89$), an average that was significantly higher than the reported normative mean ($M = 19.5$, $SD = 7.00$, Watson et al., 1988). There were no differences between the genders in negative affect scores ($t(59) = 1.43$, $p > .05$). A high internal reliability was achieved ($\alpha = .889$).

State-Trait Anger Expression Inventory – 2 (STAXI-2)

The STAXI-2 (Spielberger, 1999) is a 57-item inventory designed to measure the intensity of anger as an affective state and the dispositional tendency to experience angry feelings. The instrument comprises six scales (State Anger, Trait Anger, Anger Expression-Out, Anger Expression-In, Anger Control-Out, Anger Control-In), and an Anger Expression Index. The STAXI-2 is

a widely used measure of anger and is psychometrically strong, demonstrating good internal reliability ($\alpha = .74 - .90$; see Spielberger, 1999). Higher scores indicate greater levels of anger. The State Anger Scale was used for the present study.

The mean STAXI-2 State Anger Scale score was 19.97 ($SD = 6.54$), an average that is consistent with means reported among similar populations ($M_{Males} = 22.71$, $SD = 8.94$; $M_{Females} = 24.05$, $SD = 10.64$; Spielberger, 1999). State anger did not differ significantly between men and women ($t(59) = 1.23$, $p > .05$). The STAXI-2 State Anger Scale had high internal reliability ($\alpha = .905$).

2.3.4 Violence and Victimization Measurement

MacArthur Violence Risk Assessment Study Violence Instrument (MAC-VI)

The MacArthur Violence Risk Assessment Study Violence Instrument (MAC-VI; Monahan et al., 2001) is based on an expansion of the Conflict Tactics Scale (CTS; Straus & Gelles, 1990). The instrument evaluates whether the respondent has engaged in or been the victim of eight categories of aggression during a given time period: i) pushing, grabbing, or shoving; ii) kicking, biting, or choking; iii) slapping; iv) throwing an object; v) hitting with a fist or object; vi) sexual assault; vii) threatening with a weapon; and viii) using a weapon during the defined period. The instructions were modified to include the period of time since the last interview. If multiple incidents of differing severity occurred in a single transaction, only the most serious type of violence was coded, in addition to any solitary incidents of violence. Participants were also queried with supplemental aggression questions about whether they had engaged in or been

the victim of three additional types of aggression: i) threatened to harm, but without a weapon in hand, ii) yelled or screamed in a way that frightened, and iii) did anything else that made someone afraid for their safety. Additional information was collected about the most recent instance of violence perpetration and victimization experience during each follow-up interval including the date of the incident, individuals involved, location, and severity of injury.

2.3.5 Measurement of Control Variables

Several variables were measured at baseline so that they could be controlled in subsequent analysis. Based on the literature, control variables for violence outcomes within the population of interest were problems with substance use, psychopathy, and the presence of threat-control override symptoms. Control variables for victimization outcomes included problems with substance use, presence of threat-control override symptoms and social support.

Michigan Alcohol Screening Test (MAST)

The Michigan Alcohol Screening Test (MAST; Pokorny, Miller, & Kaplan, 1972) is a 25-item self-report measure which assesses the presence or absence of impairment associated with alcohol abuse. All items are rated on a 2-point scale (yes/no) with higher scores being indicative of greater problems related to alcohol use. The MAST has excellent internal consistency ($\alpha = .83 - .95$, Gibbs, 1983.) as well as high test-retest reliability among psychiatric inpatient and outpatients (Zung, 1979). The mean MAST score was 8.14 ($SD = 4.29$). Internal reliability was good ($\alpha = .867$).

Drug Abuse Screening Test (DAST)

The Drug Abuse Screening Test (DAST; Skinner, 1982) is a 28-item self-report questionnaire assessing the degree to which individuals have been impaired because of their non-medical use of drugs, or excess use of prescription drugs. Items are rated as present or absent. The DAST has been found to have good internal consistency and was good in discriminating between individuals diagnosed with a DSM-III diagnosis of substance abuse in a large sample of psychiatric patients (Staley & el-Guebaly, 1990). The mean DAST score was 8.00 ($SD = 5.57$). Internal reliability was good ($\alpha = .880$).

The Hare Psychopathy Checklist: Screening Version (PCL-SV)

The Hare Psychopathy Checklist: Screening Version (PCL:SV; Hart, Cox, & Hare, 1995) is a 12-item interview-based instrument that measures psychopathic personality, a construct related to ASPD). The interview is based on a subset of the PCL-Revised items that can be completed in approximately 1.5 hours. Items assess behavioural characteristics identified in the DSM-IV-TR and also emphasize the affective personality features of the construct (e.g., grandiosity, callousness). Items are rated on a 3 point scale (0= *Item does not apply*, 2= *Item applies*). The PCL:SV has been found to predict violence in various settings, including among discharged psychiatric patients (Skeem & Mulvey, 2001) and has acceptable inter-rater reliability (Nolan, Volavka, Mohr, & Czobor, 1999). Good internal consistency among a civil psychiatric sample drawn from the Vancouver area ($\alpha = .88$ for total score, .87 for Part I, .84 for Part II), as well as adequate concurrent, convergent and discriminant validity have

been reported (see Hart et al., 1995). The mean PCL-SV score was 6.55 ($SD = 4.64$). This score is consistent with published norms based on civil psychiatric patients ($M = 5.18$, $SD = 4.34$, 2.1% with score ≥ 18 ; Hart et al., 1995). Internal reliability for the PCL-SV was good ($\alpha = .816$). Inter-rater reliability was strong [$ICC_1 (N = 14) = .903$, 95% CI = .735 - .968, $p < .001$, Hendry, 2009].

TCO Delusion Items

Two items were selected from the PERI-TCO subscale (Dohrenwend, Levav, & Shrout, 1986; Link, Stueve, & Phelan, 1998) to assess the presence of threat/control override symptoms. Respondents were asked to rate on a 4-point Likert scale (0 = *Never*, 4 = *Very Often*) how often they felt specific TCO symptoms (i.e., *“How often have you felt that your mind was dominated by forces beyond your control?; “How often have you felt that there were people who wished to do you harm?”*). Instructions were modified to measure the time interval since the last time the participant was interviewed. Thirty percent of the baseline sample reported experiencing harm or force delusions over the past week, a proportion that is higher than that reported in similar populations (e.g., Appelbaum et al., 2000, Teasdale et al., 2006).

Interpersonal Support Evaluation List (ISEL)

The Interpersonal Support Evaluation List (ISEL; Cohen, Mermelstein, Kamarck, & Hoberman, 1985) is a 40-item self-report measure that assesses the perceived availability of four separate functions of social support that can potentially facilitate coping with stressful events. Each function is measured

through 10 items. The Tangible subscale measures the perceived availability of material aid. The Appraisal subscale measures the perceived availability of someone to talk to about problems. The Self-Esteem subscale measures the perceived availability of a positive comparison when comparing self to others. Finally, the Belonging subscale measures the perceived availability of companions to enjoy activities with. Good internal reliability has been found for the total ISEL scale and subscales in several samples ($\alpha = .88 - .90$; Cohen et al., 1985). Higher scores suggest greater levels of perceived social support. The mean ISEL score was 24.41 ($SD = 8.28$), which is significantly lower than mean scores reported for the general population ($M = 32.9 - 34.4$, $SD = 4.96 - 5.98$, Cohen et al., 1985). Internal reliability for the ISEL was good ($\alpha = .867$). Table 6 summarizes the mean scores for the measured predictor and control variables.

Table 6: Mean Scores for Predictor and Control Variables

	N	Minimum	Maximum	Mean	SD
PSS-10	66	12	38	22.29	6.43
HSUPS-Hassles	66	4	106	37.62	19.75
PCCEA-B	62	8	40	24.84	7.56
CISS-SSC Scales					
Task	64	9	35	22.20	5.78
Emotion	64	9	35	21.95	7.40
Avoidance	64	7	33	17.94	6.23
PCCEA-B	62	8	40	24.84	7.56
PANAS-Negative	65	10	50	27.94	8.89
STAXI-2-State Anger	65	15	40	19.97	6.54
MAST	66	0	24	8.14	4.29
DAST	66	0	23	8.00	5.57
PCL-SV	67	0	17	6.55	4.64
TCO Symptoms	67	0	1	0.30	0.46
ISEL	66	4	39	24.41	8.28

Note. PSS-10 = Perceived Stress Scale-10, HSUPS-Hassles = Hassles and Uplifts Scale-Hassles Scale, PCCEA-B = Perceived Coping Competence and Efficacy Assessment-Part B, CISS-SSC = Coping Inventory for Stressful Situations-Situation Specific Scale, PANAS-Negative = Positive and Negative Affect Schedule-Negative Scale, STAXI-2 State Anger = State-Trait Anger Expression Inventory-2-State Anger Scale, MAST = Michigan Alcohol Screening Test, DAST = Drug Abuse Screening Test, PCL-SV = Hare Psychopathy Checklist-Screening Version, TCO Delusions = Threat/Control Override Delusion Items, ISEL = Interpersonal Support Evaluation List.

3: RESULTS

Descriptive results of violence perpetration and victimization outcomes are presented first. After this, results of a series of logistic regression analyses testing for main effects of the predictors on violence and victimization is described, followed by findings for the moderation analyses and the mediation analyses. Finally, results of a series of hazard analyses are presented.

3.1 Descriptives for Outcome

3.1.1 Violence

Outcome data from 53 participants from the five follow-up interviews were collapsed into a single variable capturing a six month follow-up period. Endorsed items assessing violence on the Violence Instrument derived from the MacArthur Violence Risk Assessment Study and the three Supplemental violence questions were aggregated to obtain a single outcome variable for violence perpetration. These aggregated scores were then dichotomized as being either present (i.e., at least one item endorsed = 1) or absent (i.e., no items endorsed = 0). During the six month follow-up period, 32.1% ($n = 17$) of the follow-up sample reported engaging in violence. Steadman et al. (1998) reported a rate of 44.6% for self-reported violence and other aggressive acts for a similar population over twice the follow-up length. The mean number of endorsed items was .55 ($SD = .95$). Table 7 displays the number of participants who reported engaging in violence

for each follow up wave. Men and women were equally likely to engage in violence ($\chi^2(1) = .032, p > .05$), a result that is consistent with similar research (e.g., Monahan et al., 2001).

Table 7: Number of Participants Reporting Violence Perpetration at Each Wave of Follow-Up

	Follow-up Wave				
	1	2	3	4	5
Violence	8	8	1	1	4
No Violence	45	34	37	34	24

3.1.2 Victimization

Similar to the violence, outcome data from the five follow-up interviews were collapsed into a single variable representing a six month follow-up period (see Table 8). Endorsed items assessing victimization on the MacArthur Violence Risk Assessment Study-Violence Instrument and three Supplemental victimization questions were aggregated as dichotomized as described above. About 35.8% ($n = 19$) of the follow-up sample reported experiencing violent victimization. Teasdale (2009) found a similar rate of 32% violent victimization after a 10 week follow-up among discharged psychiatric patients. The mean number of endorsed items was .59 ($SD = 1.05$). Men and women were equally likely to report the experience victimization during follow-up ($\chi^2(1) = 2.245, p > .05$).

Table 8: Number of Participants Reporting Victimization at Each Wave of Follow-Up

	Follow-up Wave				
	1	2	3	4	5
Victimization	9	10	3	2	1
No Victimization	44	32	35	33	27

There was a positive relationship between violence and victimization ($\beta=.489$, $p < .001$). Most of the violence and victimization reported was less severe in nature. Table 9 below displays the disaggregated frequencies for both outcomes.

Table 9: Disaggregated Outcome Frequencies

Mac- VI Item	Violence	Victimization
Make to feel afraid for safety	3	7
Scream in frightening way	12	11
Threaten to harm (no weapon)	3	3
Throw something at someone, push, grab, shove someone	5	4
Slap, kick, bite, choke, beat with fist, sexual assault	3	2
Threaten with lethal weapon, use a knife or gun on someone	1	1
Total Frequency of Outcome Incidents	27	28

3.2 Hypothesis Testing

A series of direct and hierarchical logistic regression (LR) models was conducted to test the association between each of the dichotomous outcomes (i.e., violence and victimization) with a set of predictors (i.e., stress, coping and NA).¹⁰ LR (or logit modelling) is a popular technique used to estimate the

¹⁰ Conventionally, statistical inference for the prediction of dichotomous outcomes involves estimating parameters through the maximization of unconditional likelihood functions in

probability of a particular binary response (e.g., failure) given a set of explanatory variables (Agresti, 1996; Cohen et al., 2003). The S shaped logistic function models binary response variables more realistically compared to Ordinary Least Squares (OLS) regression. β values greater than zero indicates that the probability increases as levels of the explanatory variable increases; β values less than zero indicate that the probability decreases as levels of the explanatory variable increase (Agresti, 1996). LR requires no assumptions concerning the distribution of the predictor variables and models may comprise predictor variables of all data types (continuous, dichotomous, etc.; Agresti, 1996; Cohen et al., 2003). LR is particularly useful because the technique allows for the generation of odds ratio (ORs) which can be used to interpret the effect of each predictor variable on the outcome. The odds increase multiplicatively by e^β for every one unit increase in the predictor variable. In other words, the OR represents the increase (or decrease if less than 1) in the odds of being classified in a category when the predictor variable increases by 1 unit. When $\beta = 0$, $e^\beta = 1$ and the odds of the outcome do not change as the predictor variable changes (Agresti, 1996).

binary logistic regression models, and then performing hypothesis testing with either the Wald, likelihood ratio or the efficient scores statistic. However, for data sets with small sample sizes, the usual asymptotic methods can be unreliable (King & Ryan, 2002; Mehta & Patel, 1995). An alternative approach is Exact Logistic Regression (ELR) which bases inference on enumerating the exact permutational distributions of the sufficient statistics that correspond to the regression parameters of interest, conditional on fixing the sufficient statistics of the remaining parameters at their observed values (Agresti, 1996; Mehta & Patel, 1995). Inference using ELR tends to be more conservative than that yielded using large sample approximations in conventional LR which tends to over-estimate p -values in small, skewed and sparse datasets (King & Ryan, 2002). Thus, a series of ELRs was conducted using LogXact 8.0.0 (Cytel Studio, 2007) to confirm whether predictive relationships existed between stress, coping, negative affect variables and the two outcomes as estimated with asymptotic LR. All findings were similar to that reported above.

3.2.1 Control Variables

To avoid over-fitting the models, control variables established in previous research literature were first tested separately to confirm their association with the outcome variable in the present sample. The inclusion of control variables in subsequent analysis was restricted to only those that were associated with violence or victimization as hypothesized.

A direct logistic regression (LR) was conducted to test whether substance use, psychopathy, and presence of TCO symptoms predicted violence. Given the unequal length of follow-up time between participants, number of days of follow-up was additionally entered into the model to test for time at risk effects. Tolerance values were above the .10 threshold (ranging from .529 - .872) and Variance Inflation Factor (VIF) values were small compared to the cut off of 10 (ranging from 1.147 - 1.891) indicating the lack of multicollinearity among the IVs¹¹. No outliers were identified. All predictors were entered simultaneously into the model through direct entry. Regression results indicated the overall fit of the model was poor (-2 Log Likelihood = 56.523, Nagelkerke R^2 = .145) and did not reliably classify violence perpetration (χ^2 (5) = 5.383, p = .371). The model only correctly classified 67.3% of the cases. None of the entered IVs were significant predictors of violence. Only psychopathy approached significance in predicting violence perpetration (OR = 1.195, 95% CI = .999 - 1.428, p = .051). These

¹¹ Tolerance and the Variance Inflation Factor (VIF) are measures of the degree of multicollinearity. The VIF is an index of the amount that the variance of each regression coefficient is increased compared to a situation where all of the IVs are uncorrelated. Commonly, a cut off of VIF values of ≥ 10 is considered support for serious multicollinearity involving the associated IV. Tolerance is the reciprocal of the VIF and indicates how much variance in the X_i are independent of other IVs. It is generally agreed that tolerance values of .10 or less indicate serious multicollinearity problems in the regression model (Cohen, Cohen, West & Aiken, 2003).

results suggest that the odds of violence increase by 19.5% with a one unit increase in PCL-SV score. Table 10 displays the regression coefficients, odds ratios and confidence intervals for all tested control variables for violence. Given these results, only psychopathy was entered into subsequent models testing predictors of violence perpetration.

Table 10: Regression Coefficients for Violence Control Variables

	B	Wald	df	OR	95% CI		p
					Lower	Upper	
MAST	-.072	.582	1	.930	.773	1.120	.446
DAST	-.007	.008	1	.993	.847	1.164	.930
PCL-SV	.178	3.804	1	1.195	.999	1.428	.051*
TCO Delusions	.707	.801	1	2.028	.431	9.528	.371
Time	.005	.685	1	1.005	.994	1.016	.408
Constant	-2.428	2.235	1	.088			.135

Note. MAST = Michigan Alcohol Screening Test, DAST = Drug Abuse Screening Test, PCL-SV = Hare Psychopathy Checklist-Screening Version, TCO Delusions = Threat/Control Override Delusion Items.

Similarly, a direct LR model was estimated to test whether substance use (as measured by the MAST and DAST), the presence of TCO symptoms, social support measured by the ISEL, and time at risk predicted victimization. Tolerance values ranged from .567 - .916 and VIF values ranged from 1.092 - 1.763 indicating the lack of multicollinearity among the IVs. No outliers were found. Results indicated that none of the hypothesized control variables were significant predictors of victimization (-2 Log Likelihood = 59.701, Nagelkerke R^2 = .097, χ^2 (5) = 3.561, p = .614). Regression coefficients, odds ratios and confidence intervals are displayed in Table 11. No additional covariates were entered into subsequent models testing predictors of victimization in light of these findings.

Table 11: Regression Coefficients for Victimization Control Variables

	B	Wald	df	OR	95% CI		p
					Lower	Upper	
MAST	-.092	1.149	1	.912	.770	1.079	.284
DAST	.075	.994	1	1.077	.931	1.247	.319
TCO Delusions	-.635	.856	1	.530	.138	2.033	.335
ISEL	-.017	.182	1	.983	.911	1.062	.670
Time	.005	.963	1	1.005	.995	1.016	.326
Constant	-.413	.087	1	.662			.768

Note. MAST = Michigan Alcohol Screening Test, DAST = Drug Abuse Screening Test, TCO Delusions = Threat/Control Override Delusion Items, ISEL = Interpersonal Support Evaluation List.

3.2.2 Violence Prediction

A series of hierarchical LRs models was used to test the first set of hypotheses that stress, coping and NA were predictive of violence. All predictors were tested independently in separate models, controlling for level of psychopathy. Psychopathy was entered into the first block, and each of the nine predictors was entered into a second block, respectively. Prior to analysis data screening revealed no outliers to be eliminated for any of the models. Collinearity diagnostics revealed that multicollinearity was not present for any of the models tested in this series (Tolerance range = .801 – 1.00, VIF range = 1.009 - 1.248). Results indicated that after controlling for psychopathy, only daily hassles was a significant predictor of violence perpetration (-2 Log Likelihood = 55.443, Nagelkerke R^2 = .172, χ^2 (2) = 6.462, p = .040, OR_{adj} = 1.040, p < .05, 73.5% correct classification). Hence, there was a 4% increase in the risk of engaging in violence for each of the 53 steps in daily hassles. All other variables were not associated with the violence outcome (see Table 12 for regression coefficients, OR_{adj} and 95% CIs).

Table 12: Regression Coefficients for Predictors of Violence Controlling for Psychopathy

	B	Wald	df	OR _{adj}	Lower	Upper	p
Stress							
PSS-10	.080	1.858	1	1.084	.985	1.191	.097
HSUPS-Hassles	.039	3.951	1	1.040	1.001	1.081	.047*
Coping							
PCCEA-B	-.060	1.693	1	.941	.859	1.031	.193
CISS-SSC Scale							
Task	-.017	.105	1	.983	.888	1.089	.746
Emotion	.013	.084	1	1.014	.925	1.111	.773
Avoidance	.025	.200	1	1.025	.920	1.141	.655
Negative Affect							
PANAS-Negative	.060	2.386	1	1.062	.984	1.146	.122
STAXI-2 State Anger	.040	.823	1	1.041	.954	1.136	.364

Note 1. PSS-10 = Perceived Stress Scale-10, HSUPS-Hassles = Hassles and Uplifts Scale-Hassles Scale, PCCEA-B = Perceived Coping Competence and Efficacy Assessment-Part B, CISS-SSC = Coping Inventory for Stressful Situations-Situation Specific Scale, STAXI-2 State Anger = State-Trait Anger Expression Inventory-2 – State Anger Scale, PANAS-Negative = Positive and Negative Affect Schedule-Negative Scale.

Note 2. * = statistically significant at $p < .05$.

3.2.3 Prediction of Victimization

A series of direct LR models was used to test the second set of hypotheses that stress, coping and NA were predictive of the experience of victimization. It was hypothesized that higher levels of stress, emotion and avoidance coping, and negative affect would be associated with victimization. It was further hypothesized that perceived coping ability and task coping would be inversely related to victimization. All predictors were entered independently into separate models. Data screening revealed no outliers. Results indicated that daily hassles (-2 Log Likelihood = 60.120, Nagelkerke $R^2 = .106$, $\chi^2 (1) = 3.983$, p

= .046, $OR = 1.058$, $p < .05$, 66.0% correct classification) and coping competence (-2 Log Likelihood = 56.263, Nagelkerke $R^2 = .184$, $\chi^2 (1) = 6.999$, $p = .008$, $OR = 0.894$, $p < .05$, 69.4% correct classification) were independent predictors of prospective victimization. In addition, perceived stress (-2 Log Likelihood = 59.282, Nagelkerke $R^2 = .108$ $\chi^2 (1) = 3.980$, $p = .046$, $OR = 1.096$, $p = .054$, 65.3% correct classification) was a marginally significant predictor of prospective victimization. Hence, the odds of victimization increased by 5.8% for each of the 53 steps in the Daily Hassles Scale. Similarly, the risk for victimization increased by 9.6% with every one-unit increase in the 10-item Perceived Stress Scale. The effect of coping on victimization was in the predicted opposite direction as to that of stress. With every one unit increase among the ten levels of perceived coping, there is a 10.6% decrease in the likelihood of reporting victimization. All other variables were not associated with the experience of violent victimization (see Table 13 for regression coefficients, ORs and 95% CIs); however, that task-oriented coping decreased the odds of victimization reached marginal significance.

Table 13: Regression Coefficients for Predictors of Victimization

	B	Wald	df	OR	95% CI		p
					Lower	Upper	
Stress							
PSS-10	.091	3.709	1	1.096	.998	1.203	.054†
HSUPS-Hassles	.057	6.958	1	1.058	1.015	1.104	.008*
Coping							
PCCEA-B	-.113	5.979	1	.894	.816	.978	.014*
CISS-SSC Scale							
Task	-.098	3.266	1	.907	.816	1.008	.071
Emotion	.042	1.118	1	1.043	.964	1.129	.290
Avoidance	.039	.573	1	1.040	.940	1.151	.449
Negative Affect							
PANAS-Negative	.032	.839	1	1.032	.965	1.104	.360
STAXI-2 State Anger	-.007	.026	1	.993	.910	1.083	.872

Note 1. PSS-10 = Perceived Stress Scale-10, HSUPS-Hassles = Hassles and Uplifts Scale-Hassles Scale, PCCEA-B = Perceived Coping Competence and Efficacy Assessment-Part B, CISS-SSC = Coping Inventory for Stressful Situations-Situation Specific Scale, STAXI-2 State Anger = State-Trait Anger Expression Inventory-2 – State Anger Scale, PANAS-Negative = Positive and Negative Affect Schedule-Negative Scale.

Note 2. * = statistically significant at $p < .05$, †marginal significance.

3.3 Moderation Analysis

The third set of hypotheses suggested that gender would moderate the effects of coping on both outcomes. Specifically, it was hypothesized that coping failure among males would increase the likelihood of adverse outcome. In light of the analysis thus far regarding null results in the association between coping and violence, it remained important to test both outcomes because it was possible that effects were being masked by differential responding of males and females.

Predictor variables were centered on their means before entry into the model to reduce multi-collinearity with the interaction term.¹²

Coping competence and Task-, Emotion- and Avoidance-oriented coping were tested separately. Each predictor was entered into a direct LR model with gender predicting an outcome of violence. An interaction term (i.e., predictor*gender) was also entered into each model to determine whether gender moderated coping effects on violence. After inspecting the interaction terms for significance, it was found that gender did not moderate the effects of any of the four coping variables on violence (see Table 14). Notably, gender appeared to moderate the effect of Task coping on violence at a marginally significant level (-2 Log Likelihood = 55.882, Nagelkerke R^2 = .123, χ^2 (3) = 4.482, p =.214, OR = .795, p = .058, 73.5% correct classification). Men who engaged in task coping had a higher odds of engaging in violence (OR = 1.079) whereas women had lower odds of violence (OR = 0.857).

Second, coping competence, Task, Emotion and Avoidance coping were entered into four separate direct LR models along with gender to predict victimization. None of the interaction terms was significantly different from zero. On the whole, these findings suggest that gender was not a moderator of the effect of coping on the experience of victimization.

¹² Gender was not centered on its mean because it is a dichotomous variable (Male = 0, Female = 1).

Table 14: Regression Coefficients for Interaction Terms Moderation Analysis

Gender*X	B	Wald	df	OR	95% CI		p
					Lower	Upper	
<i>Violence Prediction</i>							
PCCEA-B	-.077	.741	1	1.008	.882	1.152	.910
<i>CISS-SSC Scale</i>							
Task	-.231	3.607	1	.795	.626	1.007	.058†
Emotion	.004	.001	1	1.004	.830	1.214	.969
Avoidance	.049	.213	1	1.051	.852	1.296	.645
<i>Victimization Prediction</i>							
PCCEA-B	-.094	.917	1	.910	.750	1.104	.338
<i>CISS-SSC Scale</i>							
Task	-.188	2.325	1	.829	.651	1.055	.127
Emotion	.034	.115	1	1.035	.849	1.261	.734
Avoidance	-.086	.111	1	.917	.738	1.140	.436

Note 1. PCCEA-B = Perceived Coping Competence and Efficacy Assessment-Part B, CISS-SSC = Coping Inventory for Stressful Situations-Situation Specific Scale.

Note 2. * = statistically significant at $p > .05$, †marginal significance.

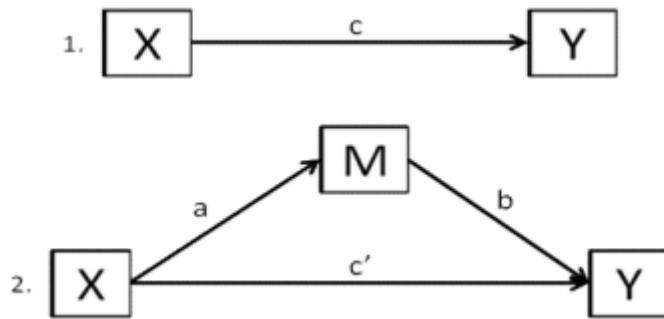
3.4 Mediation Analysis

The fourth set of hypotheses concerned the mediation of coping on the influence of stress on outcome. According to Baron and Kenny (1986), mediation analysis can be used to demonstrate a causal chain in which an intervening variable assists in explaining the effects of an IV on a DV. In a three-variable mediation model, the IV is hypothesized to cause the mediator, which, in turn, causes the DV. Mediation is said to exist when the influence of the IV on the DV is explained after controlling for the effect of the IV on the mediator and the effect of the mediator on the DV.

3.4.1 Criteria for Establishing Mediation

Statistical evidence of mediational effects can be established by estimating a series of regression equations showing: 1) the IV is related to the DV; 2) the mediator is related to the DV; and 3) the mediator is related to the outcome in a model controlling for the effects of the IV (Baron & Kenny, 1986; Judd and Kenney, 1981). For mediation to be supported, the associations in the first two models must be statistically significant in the predicted direction, and in the third model, the mediator must influence the DV such that the effect of the IV on the DV is reduced. Mediation is typically illustrated as shown in Figure 1 where X is the predictor variable, M is the mediator, and Y is the outcome variable.

Figure 1: Direct Effect and Typical Mediation Model



Note 1. Adapted from Baron and Kenny (1986).

Note 2. Model 1 illustrates a direct effect. Model 2 illustrates a common mediation model.

Specifically, Baron and Kenny (1986) and Judd and Kenny (1981) discuss four steps in establishing mediation. *Step 1:* Demonstrate that the IV is correlated with the outcome. This is accomplished by regressing Y on X to estimate and test path c. This step establishes that there is an effect that may be mediated. *Step 2:* Demonstrate that the IV is correlated with the mediator. To estimate and test

path a, M is regressed on X. *Step 3:* Demonstrate that the mediator affects the outcome variable, controlling for the IV. Y is regressed on both the X and M to estimate and test path b. *Step 4:* To establish that M completely mediates the association between X and Y, the effect of X on Y controlling for M (path c') should be zero. The effects in Steps 3 and 4 are both estimated and tested in the same regression model. If all four of these steps are met, then the data are consistent with the hypothesis that variable M fully mediates the effect of the IV on the outcome. If only the first three steps are met but the Step 4 fails, then partial mediation may be indicated (if c' is smaller in absolute value than c; Baron & Kenny, 1986).

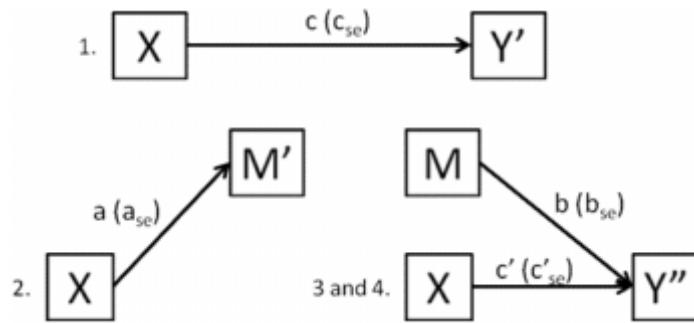
It is common as a final step to test the statistical significance of the mediated effect (indirect effect) using the Sobel (1982) test. Aroian's version of the Sobel test popularized by Baron and Cohen (1986) provides an approximate significant test for the indirect effect of the IV on the DV through the mediator. The indirect effect of the mediator is the product of paths a and b; which is equivalent to (c–c') in multiple regression models and comparable in logistic regression models. Thus a significant result of the Sobel test is evidence of at least partial mediation. The Aroian version of the Sobel test = ab/s_{ab} where the standard deviation (s_{ab}) is calculated as follows $s_{ab} = \sqrt{b^2 s_a^2 + a^2 s_b^2 + s_a^2 s_b^2}$.

3.4.2 Mediation with Dichotomous Outcomes

Testing mediation of dichotomous outcomes using logistic regression creates some challenges because the results of the analyses of the series of regression models are in different scales and are therefore not comparable

across models.¹³ To indicate that variables differ when they are predictors in the regression equations relative to when they are outcomes in the equation, the framework must be modified (see Figure 2).

Figure 2: Mediation Model for Dichotomous Outcomes using Logistic Regression



Note 1. Figure adapted from Herr (n.d.) and MacKinnon & Dwyer (1993).

Note 2. Step 1 illustrates a direct effect. Step 2 illustrates path a. Steps 3 and 4 illustrate paths b and c' which are derived from the same regression model.

Note 3. Primes indicate that variables are on different metrics (e.g., Y and Y").

To make the coefficients comparable across equations, MacKinnon and Dwyer (1993) recommend standardizing the coefficients by multiplying each coefficient by the *SD* of the predictor variable and dividing by the *SD* of the outcome variable. The calculation of the *SD* of M and X is straightforward. According to MacKinnon and Dwyer (1993, p. 149) however, the variances of outcome variables in the three equations are as follows:

$$\text{Var}(Y') = c^2 \text{Var}(X) + \pi^2/3$$

$$\text{Var}(M') = a^2 \text{Var}(X) + \pi^2/3$$

$$\text{Var}(Y'') = c'^2 \text{Var}(X) + b^2 \text{Var}(M) + 2bc' \text{Cov}(X, M) + \pi^2/3$$

¹³ The variance of the outcome variable is dependent on the variables in the model + $\pi^2/3$. Therefore models that do not have the same variables entered, such as the series of regressions required to test mediation, produce coefficients that are not comparable (MacKinnon & Dwyer, 1993). Notably, when a variable is used as a predictor in logistic regression, it has a different scale from when it is used as an outcome variable.

These variances are then square rooted and used to standardize the coefficients.

The standardized values can then be used to calculate Sobel test z scores.

3.4.3 Mediation Hypotheses

It was hypothesized that coping would mediate the effects of stress on violence and victimization. Thus, a series of OLS regressions and LRs was conducted to determine if coping competence was a mediator of stress on violence or victimization. Task, Emotion, and Avoidance coping were also tested as potential mediators.

Mediation by Coping Competence

The first step in establishing mediation is that the IV must predict the outcome. Based on the results presented above, mediation testing was restricted to the following models where an association between stress and outcome has already been established: 1) coping competence mediating the effect of daily hassles on violence, 2) coping competence mediating the effect of daily hassles on victimization, and 3) coping competence mediating the effect of perceived stress on victimization.

To test the first model of coping competence mediating the effect of daily hassles on violence, the analysis continued with Step 2 where the IV must be shown to be associated with the mediator. Hence, coping competence was regressed on daily hassles in an OLS regression model. The mediation analysis fails at this level because daily hassles was not a significant predictor of coping competence [$R^2 = .037$, $R^2_{adj} = .022$, $F(1, 63) = 2.40$, $p > .05$]. This result

suggests that coping is not a mediator of daily stress in the prediction violence in this sample. Similarly, the second model testing whether coping competence mediates the effect of daily hassles on victimization also fails at the second step because daily hassles does not predict coping competence. Thus coping is not a mediator of daily stress's effect on violent victimization in this sample.

Finally, the third model testing whether coping competence mediated the effect of perceived stress on victimization was estimated. It has already been established through the LR discussed in the previous section that perceived stress predicts victimization ($\beta = 0.91, p=.054$). This path coefficient (c) was standardized to allow comparisons with coefficients in the next steps (see Figure 2). The analysis proceeded with Step 2 where coping competence was regressed on perceived stress in an OLS regression model. Results indicated that perceived stress significantly predicted coping competence ($R^2 = .119, R^2_{adj} = .104, F (1, 63) = 8.35, p <.05, t = 10.449, p <.05$). As predicted, higher levels of perceived stress were associated with lower levels of perceived coping competence (see Table 15 for regression coefficients). This path coefficient (a) was standardized for future comparison.

Table 15: Regression Coefficients in the Prediction of Coping Competence by Perceived Stress

	B	SE	Standardized β	t	p
PSS-10	-.405	.140	-.348	-2.896	.005*
Constant	33.950	3.239		10.481	.001

Note 1. PSS-10 = Perceived Stress Scale-10, PCCEA-B = Perceived Coping Competence and Efficacy Assessment-Part B.

Note 2. * = statistically significant at $p>.05$

For Step 3, a direct LR model was estimated regressing victimization on both coping competence and perceived stress. No outliers were identified. Results showed that coping competence remained a significant predictor of victimization while controlling for perceived stress. In Step 4 evaluating the same model, it was found that the prediction of victimization by perceived stress was reduced when coping competence was entered into the model (see Table 16).

Table 16: Regression Coefficients in the Prediction of Victimization by Coping Competence and Perceived Stress

	B	SE	Wald	df	OR	p
PSS-10	.075	.050	2.245	1	1.078	.134
PCCEA-B	-.098	.048	4.215	1	.907	.040*
Constant	.062		.001	1		.972

Note 1. PSS-10 = Perceived Stress Scale-10, PCCEA-B = Perceived Coping Competence and Efficacy Assessment-Part B.

Note 2. * = statistically significant at $p > .05$

Standardized path coefficients were calculated and substituted into Aroian's version of the Sobel test to determine whether the indirect effect of the mediator was significantly different from zero (see Table 17). It was found that the indirect effect was not significant; in other words, the total effect of X on Y was not significantly reduced upon the addition of the mediator in the model (Aroian test statistic = 1.605, $p > .05$). Hence, coping competence was not a significant mediator of the effect of perceived stress on victimization.

Table 17: Testing the Direct and Indirect Effects within the Coping Mediation Model

Path Coefficient	Raw B	SE	Standardized Coefficient	Corrected s
a	-0.405	0.140	-0.823	0.284
b	-0.098	0.048	-0.355	0.174
c	0.091	0.048	0.234	0.156
c'	0.075	0.050	0.309	0.163

Mediation by Coping Style

It was hypothesized that Task, Emotion and Avoidance coping mediated the effect of stress on both outcomes. However, given that it has already been reported in the previous section that CISS-SSC scales were not associated with either violence or victimization, the analysis fails at the second step for all tests involving coping style as a mediator. Thus, it can be concluded that coping style (task, emotion and avoidance oriented coping) did not mediate the effect of stress on violence or victimization in the present sample.

3.5 Hazard Analysis

Considering the unequal length of follow-up for some participants, Cox Proportional Hazard Analysis was conducted to estimate whether stress, coping and NA predictors were associated with time until outcome. In this case the predictors were considered time-constant and the criterion variable was the time that elapsed between the baseline interview and an instance of violence or victimization. This technique can make use of participants, regardless of variations in follow-up lengths (i.e., right censoring). Right-censoring refers to cases where participants have different lengths of follow-up due to death or being lost to follow-up where they are no longer “at risk” for the outcome to occur (Cohen et al., 2003).¹⁴ The hazard ratio (HR) is a measure of the potential for the event to occur at a particular time, given that the event did not yet occur.

¹⁴ Censored cases are not used in the computation of the regression coefficients, but are used to compute the baseline hazard.

Cumulative hazard is equal to the negative log of (the more widely known) survival probability (Cohen et al., 2003). Larger values of the hazard function indicate a quicker rate for the event to occur post baseline.

At each follow-up interview, more detailed information was collected about the participant's most recent violent event or experience of victimization, including the date of the incident. Dates were missing for six participants who had outcomes; therefore, the mid-point between the previous interview and the current interview was imputed as the date of the event. "Time" was calculated in days by determining the number of days between the baseline interview and the last interview for those who did not report engaging in violence or experiencing victimization, and between the baseline interview and the first outcome event, for those who did.

A series of Cox Proportional Hazard Models was estimated for violence and victimization outcomes. Each explanatory variable for stress, coping and negative affect were entered separately into the models to determine whether they were associated with increasing (or decreasing) the rate of violence and victimization. It was hypothesized that increased levels of stress, maladaptive coping (emotion and avoidant coping), NA and anger would be associated with quicker involvement in violence and victimization. Perceived coping and task-oriented coping were hypothesized to be related to delayed instances of violence perpetration and victimization. As shown in Table 18 Cox modeling identified that higher levels of daily hassles was associated with faster post hospitalization violence perpetration ($HR = 1.025, p < .05$), and victimization ($HR = 1.034, p <$

.05, see Table 19). Further, increased levels of perceived coping were marginally associated with slower rates of victimization post discharge ($HR = .938$, $p=.056$). All other variables were unrelated to the temporal rate of violence or victimization outcomes.

Table 18. Cox Regression Coefficients for Violence Outcomes

	B	Wald	df	HR	95% CI		p
					Lower	Upper	
<i>Stress</i>							
PSS-10	.052	2.090	1	1.053	.982	1.130	.148
HSUPS-Hassles	.025	3.854	1	1.025	1.000	1.051	.050*
<i>Coping</i>							
PCCEA-B	-.014	.148	1	.986	.920	1.055	.701
CISS-SSC Scale							
Task	-.010	.056	1	.990	.907	1.079	.813
Emotion	-.019	.314	1	.981	.918	1.049	.575
Avoidance	.006	.016	1	1.006	.961	1.105	.901
<i>Negative Affect</i>							
PANAS-Negative	.041	2.141	1	1.042	.986	1.102	.143
STAXI-2 State Anger	.031	.934	1	1.031	.969	1.097	.334

Note 1. HR = Hazard Ratio, PSS-10 = Perceived Stress Scale-10, HSUPS-Hassles = Hassles and Uplifts Scale-Hassles Scale, PCCEA-B = Perceived Coping Competence and Efficacy Assessment-Part B, CISS-SSC = Coping Inventory for Stressful Situations-Situation Specific Scale, STAXI-2 State Anger = State-Trait Anger Expression Inventory-2 – State Anger Scale, PANAS-Negative = Positive and Negative Affect Schedule-Negative Scale.

Note 2. * = statistically significant at $p>.05$

Table 19. Cox Regression Coefficients for Victimization Outcomes

	B	Wald	df	HR	95% CI		p
					Lower	Upper	
<i>Stress</i>							
PSS-10	.055	2.617	1	1.057	.988	1.130	.106
HSUPS-Hassles	.033	6.886	1	1.034	1.008	1.060	.009*
<i>Coping</i>							
PCCEA-B	-.064	3.643	1	.938	.878	1.002	.056†
CISS-SSC Scale							
Task	-.058	2.046	1	.944	.871	1.022	.153
Emotion	.018	.336	1	1.019	.957	1.084	.562
Avoidance	.011	.053	1	1.011	.921	1.109	.819
<i>Negative Affect</i>							
PANAS-Negative	.015	.314	1	1.016	.962	1.072	.575
STAXI-2 State Anger	-.006	.030	1	.994	.927	1.065	.862

Note 1. HR = Hazard Ratio, PSS-10 = Perceived Stress Scale-10, HSUPS-Hassles = Hassles and Uplifts Scale-Hassles Scale, PCCEA-B = Perceived Coping Competence and Efficacy Assessment-Part B, CISS-SSC = Coping Inventory for Stressful Situations-Situation Specific Scale, STAXI-2 State Anger = State-Trait Anger Expression Inventory-2 – State Anger Scale, PANAS-Negative = Positive and Negative Affect Schedule-Negative Scale.

Note 2. * = statistically significant at $p>.05$, †marginal significance at $p=.056$.

4: DISCUSSION

This study set out to explore the role of stress, coping, and negative affect in predicting prospective interpersonal violence and victimization among discharged psychiatric patients dwelling in the community. There were five sets of hypotheses that were tested. It was postulated in the first set of hypotheses that increased levels of stress, greater use of maladaptive coping styles (i.e., emotion-focused, avoidant), and higher levels of negative affect would be predictive of prospective violence after controlling for relevant covariates. Further, coping competence and task coping was postulated to be related to engaging in violence less often. Findings demonstrated that there was only partial support for this hypothesis. After controlling for psychopathy, daily hassles was the only significant predictor of violence identified. Daily hassles was a strong predictor of violence ($R=.415$)¹⁵, such that the risk of violence increased by 4.0% with every one unit increase in daily hassles. Perceived stress, coping style, and negative affect were not found to be associated with engaging in violence in this sample.

On the whole, these findings lend partial support to Strain Theory which postulates that the experience of strain coupled with perceiving violence as a means for attaining a goal or righting a perceived discrepancy potentiates

¹⁵ Cohen (1988) gives the following guidelines for interpreting effects in the social sciences:, a small effect size ranges from $R = 0.1$ to 0.23 , a medium effect size from 0.24 to 0.36 and a large effect size from 0.37 and larger.

violence, especially when personal stakes are high. In that mean levels of perceived stress and daily hassles were higher in this sample compared to norms indicates that individuals in this group experienced undue stress. This finding is not surprising considering that individuals living with MMI are more likely to face significant challenges, including stigmatization, poverty, and social isolation, relative to those without MMI (Kirby & Keon, 2006). That coping was unrelated to violence perpetration is inconsistent with Strain theory which postulates that delinquency increases under conditions where strain is high and coping resources are low. It is possible an association between coping and violent outcomes was not found due to differing conceptions about “effective” coping. That is, effective management of stressors for some individuals might be understood as the ability to circumvent violent incidents. But for others, engaging in violence itself might constitute a problem-solving strategy, particularly in times where a person feels that standing one’s ground is important. Indeed, aggressive verbal or physical behaviour towards a source of provocation in some cases can remove the stressor or alleviate distress caused by a threat. This confounding was alluded to by Lazarus (1999, 2000) who argued that despite the tendency to make generalizations about the effectiveness of particular coping styles, strategies are not universally effective or ineffective because coping is based on the individual, situation, and stage of resolving the event. Thus, the coping construct needs to be disentangled and better defined in future research.

That day-to-day hassles was a predictor of violence is also consistent with the Social Interactionist perspective (Felson, 1992) which suggests that during

times of elevated stress, individuals are more likely to aggrieve others as a result of engaging in unexpected or inappropriate social behaviour. The stressed individual is likely to engage in aggression as a reaction to social control attempts by others. It is possible that daily hassles was a predictor of violence where perceived stress was not because day-to-day hassles may be less dynamic over time. Thus, daily hassles might have lengthier predictive validity over the six month follow-up interval relative to perceived stress which might fluctuate more often and be less predictive over longer periods. For example, a person who feels that job security is a major hassle this week will likely maintain this sentiment over a longer window of time whereas perceptions of stress may fluctuate in light of the specific stressors being managed at any given moment.

The null results regarding negative affect and anger as predictors of violence is in contradiction to the Frustration-Aggression Hypothesis as well as the bulk of empirical findings reported among similar populations (e.g., Monahan et al., 2001; Novaco, 1994; Novaco & Renwick, 1988; Vitacco et al., 2009). It is possible that the follow-up length was too long on average to capture the temporal association between anger and violence. Because feelings of anger are fairly dynamic (as opposed to hostility which is more stable), they endure for a shorter period of time. The experience of anger at baseline was not related to distal violence (e.g., up to six months after hospital discharge); however, anger might be linked to more proximal violence perpetration (e.g., later that day, later that week). A closer temporal association between anger and violence than was captured might explain the null results found in the present study.

The second set of hypotheses suggested that higher levels of stress, use of maladaptive coping styles (i.e., emotion-focused, avoidant), and higher levels of negative affect would be predictive of prospective victimization. Coping competence and task coping was speculated to be predictive of reduced odds of victimization. There was some support for this hypothesis. Perceived Stress demonstrated a medium effect ($R=.329$) and daily hassles demonstrated a large effect ($R=.487$) in increasing the likelihood of experiencing victimization. Moreover, coping competence showed a large effect ($R=.429$) in reducing the odds of victimization. All together, these findings are consistent with the Social Interactionist approach (Felson, 1992) as described above. It is possible that those who are experiencing higher levels of stress engage in behaviours that are likely to irritate others thereby stimulating social control efforts that could escalate into violence. Felson suggested that often aggrieved individuals resort to aggressive behaviour before the person experiencing high stress levels. Further, those with MMI may be more prone to behaving in ways that are bizarre or irritating due to the experience of positive symptoms, thereby increasing their vulnerability to victimization if such behaviour offends others (Silver, 2002).

Similarly, an inability to cope with psychiatric symptoms or other mounting stressors may permit aggravating behaviours to accumulate and place the individual at risk to victimization from others through the Social Interactionist model described above. Indeed, Silver (2002) suggested that people living with MMI, particularly those with positive symptoms or problematic substance use tend to be involved in conflicted social relationships. These individuals are prone

to introducing negative stimuli into their interpersonal relationships which can bring about escalating conflict either when caretakers attempt to control the individual or when the patient actively resists these attempts (Silver, 2002). Similar to the violence outcome, negative affect was not associated with victimization.

The third hypothesis was that gender would moderate the association between coping and outcomes. Given that the literature suggests males are more likely to engage in traditional “fight or flight” strategies when stressed (Stroud et al., 2002; Taylor et al, 2000; Teasdale, 2009), it was postulated that the effect of coping failure would be stronger (or particularly detrimental) among males relative to females, who are more likely to nurture social relationships when stressed. While none of the moderation effects reached statistical significance, there was a marginally significant finding that gender moderated the effect of task coping on violence. However, results were not in the predicted direction. Among males, the use of task coping increased the odds of violence, whereas among females, the use of task coping decreased the odds of this adverse outcome. This findng suggests that men who are active “problem-solvers” may be more prone to resolve stressors with aggression whereas women who engage in problem-solving coping find adaptive methods to circumvent the use of violence. This result lends credence to Lazarus’s caution that particular coping styles are not inherently “adaptive” or “maladaptive”. In any event, there is some evidence of gendered adaptivity of coping style that warrants further exploration.

The fourth hypothesis tested was that coping ability would mediate the effect of stress on violence and victimization outcomes. While perceived stress predicted coping competence, coping competence did not appear to carry the influence of stress to either prospective outcome. Coping style also did not function as a mediator. These results are in contrast to Lazarus and Folkman's (1984) Transactional Model of stress and coping which postulates a causal chain in which coping mediates stress and outcome. The implication that coping does not mediate the effect of stress on victimization is that the experience of adverse outcomes related to stress cannot be theoretically mitigated by enhancing coping skills among those with MMI. However, it is reasonable to suggest that improving coping skills may protect those who are living with mental illness from future victimization given that there is a main effect for coping competence on victimization. At this point, it is not known *which* coping skills upon which to focus intervention; however, given that there is some evidence that gender should be taken into account insofar as traditionally "adaptive" task coping might be related to increasing the odds of a violent outcome among males. There is no evidence that a similar boost in coping skills would be helpful in preventing individuals with MMI from engaging violent behaviour.

Finally, the last hypothesis was that elevated levels of stress, maladaptive coping (emotion and avoidant coping), NA and anger will be associated with faster involvement in violence and victimization. Perceived coping and task-oriented coping were predicted to be related to delayed instances of violence perpetration and victimization. It was found that higher levels of daily hassles was

associated with faster post hospitalization discharge violence perpetration ($HR = 1.025, p < .05$), and victimization ($HR = 1.034, p < .05$). Moreover, higher levels of perceived coping were marginally related to deferred rates of victimization post ($HR = .938, p = .056$). Again, these results are consistent with Strain Theory (Agnew, 1992) and Social Interactionist Theory (Felson, 1992) as discussed above.

With respect to generalizability, these findings are best extended to those individuals who have been recently discharged from an emergency psychiatric facility. There are approximately 130,000 individuals in British Columbia who live with a mental illness or substance use problem (Patterson, Somers, McIntosh, Shiell, & Frankish, 2007). These findings are most relevant to the approximately 20% of the MMI population who are discharged from general and psychiatric hospitals annually for psychiatric related reasons (Canadian Institute for Health Information, 2007). Psychiatric patients who are discharged from hospital are more likely to be experiencing disruption in their private and professional lives relative to others living with MMI who are generally more stable; therefore, the results from this study must be restricted to this subset of the population. More specifically, findings should be interpreted in light of the sample being constituted of mostly involuntarily committed patients whose reason for admission was protection of self.

4.1 Implications

The clinical implications of interpersonal violence among those living with mental illness are vast, and the incidence of such incidents among those with

MMI are less tolerated compared to the general population. The experience of violence as well as victimization, regardless of severity, is tremendously detrimental to those with mental illness in that such incidents reduce the availability of protective factors, such as social support, as well as further disrupts treatment advances and already fragile general functioning.

Identifying dynamic predictors of violence contributes to evidence-based practices to guide therapists in risk management interventions. The benefit of investigating dynamic predictors of violence is that such variables are subject to modification through intervention. Based on the findings of the present study it might be beneficial to include daily hassles to risk assessment and management frameworks (such as SPJ schemes) to increase predictive accuracy and target for intervention in order to facilitate violence prevention. Stress levels and coping competence can be assessed and similarly targeted for intervention to reduce vulnerability to violent victimization in the community.

Currently, there are cognitive and behavioural therapies that are available to address deficiencies in stress management, coping skills and mood regulation (e.g., anger management). The benefits of stress management expand beyond that of violence and victimization risk management, and aids in cultivating mental health more generally. Stress management programs have been found to reduce readmission into hospital among schizophrenic samples (Norman, Malla, & McLean, McIntosh, Neufeld, Voruganti, et al., 2002). Common features of stress management training include muscular relaxation, time management, and coping skills training. The benefits of cognitive behavioural programmes designed to

address deficits in coping abilities for discharged patients with schizophrenia have been well documented (Kopelwicz, Liberman, Wallace, 2003; Liberman, & Silbert, 2005). Problem-Solving Training (PST) involves prescriptive teaching of the structure and logical sequence of effective problem solving. Training alternatives include Cognitive Restructuring (e.g., reframing flawed attributions and hostile appraisals) and buffer creation (e.g., social support interventions, humour therapy, mood regulation skills). In terms of anger management, a wide selection of interventions, providing a range of psychodynamic, psychoeducational and cognitive-behavioural treatments, are available for mental health therapists to assist psychiatric patients with anger and aggressive behaviours (Anderson-Malico, 1994).

4.2 Limitations

There are a number of limitations to the present study. The following is a brief discussion of the chief issues. These include small sample size, confounding of outcome variables, extraneous control variables, restricted time point measurement, self-report measurement and broad categorizations.

4.2.1 Small Sample Size

A small sample size can reduce the power to detect an effect if one exists (Cohen, 1992), particularly in analyses that model multiple covariates. Null results yielded from underpowered analyses should be interpreted with caution. To reduce this effect, inference testing with the present sample was restricted to one or two covariates. Findings were also confirmed using more conservative

methods such as Exact Logistic Regression While reliable patterns in the data were found that helps give credibility to the findings, it is important to emphasize that generalizations of results from a small sample size may be unwarranted without replication. This is particularly true in the case of the present study where select subgroups of the population of interest appear to have been sampled; specifically, involuntarily committed patients with a risk of harm to self. It is possible that the predictor variables of interest examined in this study function differently among this subgroup relative to other people living with MMI. Therefore, it is clearly premature to extend these findings too broadly. Future research with larger samples that allow the construction of more complex hierarchical models that take into account multiple predictors (e.g., stress, and coping) in the same model would facilitate more ecologically valid findings. Relatedly, the multiple testing of models without correction for family-wise error and interpretation of marginally significant findings increased the risk of making a Type I error.

4.2.2 Confounding of Outcome Variables

Because violence and victimization were moderately positively correlated, interpretation of the results becomes nebulous. When violence and victimization are bi-directional and occur during the same incident, it is difficult to disentangle whether the predictor variables are related to outcomes of violence perpetration, victimization, or both. It is recommended that future studies attempt to separate these effects by conducting multi-wave studies in which the temporal sequencing of these outcomes are measured. The confounding of these outcomes may also

be overcome in studies that examine predictors of first experiences with violence or victimization.

4.2.3 Extraneous Control Variables

There are a number of variables that were not controlled in this study that could have potentially influenced the results. For example, it is known that Cluster B personality disorders (e.g., ASPD, Borderline, Narcissistic, Histrionic) are related to subsequent violence among those with mental illness (Crocker, Mueser, Drake, et al., 2005; Monahan et al., 2001; Mueser, Drake, Ackerson, et al., 1997; Rice & Harris, 1995; Skeem & Mulvey, 2001). While psychopathy was controlled in this study, other Cluster B personality disorders were not. It would be helpful for future research to take these diagnoses into account when explaining relationships related to violent and victimization outcomes.

Similarly, treatment noncompliance is also a well known risk factor for negative outcomes that was not controlled in this study that may have influenced the findings. Moreover, neighbourhood context was not controlled in this study. As discussed in the introduction, the neighborhoods in which participants reside are related to exposure to opportunities for victimization and perpetration of crime (e.g., Van Wyk, Benson, Fox and DeMaris, 2003). Another construct that was not controlled in this study was trauma-precipitating events. While perceived stress and daily hassles were measured, extreme stress life events (e.g., death of a loved one) were not captured. It would be beneficial to study the potential impact of major life stressors, in addition to other measures of stress, to gain a better

understanding of the role that magnitude of different types of stress plays in risk for violence and victimization.

Finally, the presence of TCO delusions may not have been adequately assessed in the study. While the most severe expressions of TCO delusions would be captured here, a lack of an effect of violent ideation on the findings should be interpreted with caution. Efforts to more comprehensively assess these symptoms should be made in the future.

4.2.4 Restricted Time Point Measurement

While the scope of the investigation was to examine whether stress, coping and negative affect were predictive of outcome, this study only examines potentially dynamic factors that preceded the outcome. This study cannot establish “causal risk factors” (i.e., a risk factor that when changed, is shown to bring about change in the outcome; Kraemer et al., 2001). Douglas and Skeem (2005) assert that studies employing single time-point estimates evaluate whether *inter-individual* levels of particular risk factors at a particular time predict violence; they do not provide any information about *intra-individual* levels of risk factors. This within-person variation of a dynamic variable is the central feature that makes the risk factor dynamic. Importantly, intervention and effective risk management relies on the capacity of a risk factor to diminish within an individual (Douglas & Skeem, 2005).

Thus, understanding the nature of the dynamic predictors is limited from examining single time points. The measurement of predictors and outcome at multiple time points assesses whether intra-individual changes in the risk factor

are associated with intra-individual changes in the odds of occurrence of the adverse outcome. If such an association can be shown, then true causal risk factors can be established. This change aspect will be examined in future research.

4.2.5 Self-Report Measurement

The measurement of some variables was restricted to subjective self-report; this method of data collection is subject to response biases. Social desirability bias can lead to the overreporting of socially desirable behaviour (e.g., treatment compliance), and towards the underreporting of both socially undesirable behaviour (e.g., aggression, substance use) as well as behaviour of a personal nature some may feel uneasy to discuss with others (e.g., victimization; Bradburn, Sudman, Blair, & Stocking, 1978). Therefore, misreporting due to socially desirable response biasing might have impacted the validity of the measurement of the outcome variables of interest. Moreover, actual recall for autobiographical events fades over time. Given that participants were asked to formulate responses about events that transpired over a four week period, accuracy of recall may be lessened. Finally, the effects of fatigue may have influenced accuracy of self-responses, in that the interview and measurement protocol was very lengthy.

4.2.6 Broad Categorizations

While the present study examined robust predictors of violence and victimization among people with mental illness, the investigation might have

benefitted from examining finer gradations of both outcome variables as well as diagnosis of mental illness itself. It is possible that the risk factors under study were increasingly or decreasingly associated with different forms (e.g., sexual violence) or severity of violence or victimization. Moreover, this study collapsed across diagnostic categories of mental illness, treating the sample as a homogenous group. However, associations between the risk factors and the outcomes may be moderated by different forms of mental illness (psychosis, depression, substance abuse disorders) or types of symptoms (delusions, mood dysregulation). Forthcoming evaluations of risk factors among members of this population should engage in measuring narrower categories of outcome and diagnosis variables to build on and clarify the findings of the present study.

4.3 Directions for Future Research

The need to protect individuals with MMI from the experience of harmful outcomes must become and remain a high priority among mental health professionals, health care administrators, and state agencies. In light of the increased risk for both violence perpetration and violent victimization among individuals with MMI, it is crucial to identify risk factors that contribute to these adverse outcomes. Understanding risk factors that underpin these adverse outcomes is crucial in designing appropriate prevention initiatives, intervention planning, and risk management. Notably, dynamic risk factors (i.e., modifiable factors that change over time) as opposed to static risk factors (generally historical factors that remain stable over time) are particularly useful because they can be targeted for intervention. Reducing the likelihood of becoming

involved in violence protects the patient and public, and curtails potentially enormous personal, economic and societal costs from incurring (e.g., legal, correctional, physical and mental health treatment).

The use of a longitudinal study design comprising multiple time-point estimates provides a more valid and reliable test of intra-individual variable change and its subsequent relationship to violence and should be used in future research. Such an analysis is planned with the present data when the *N* increases. A notable example of research employing multiple (i.e., 26) time-point assessment of hypothetical violence risk factors involved weekly interviews among a sample of 132 patients discharged from a psychiatric hospital emergency room (Mulvey et al., 2006). Participants were pre-screened for being a high risk for violence and followed up for 184 days to assess changes in substance use, drug use, and their relation to violence at the daily level. Mulvey and colleagues found that substance use as well as violence was autoregressive, where small bursts of serial behaviour would occur among a few consecutive days. Findings were also supportive of a one-day lagged effect of alcohol use on violence; that is, participants were four times more likely to report involvement in violence acts when alcohol was used the previous day. Ultimately, because there are so few studies like that described above which examine potentially dynamic risk factors over several time points conclusions about their hypothetical relation to violence or victimization (and implications for risk management or protection management) have yet to be confirmed (Douglas & Skeem, 2005). Violence risk assessment is populated with studies that are cross-sectional or retrospective

(Douglas & Skeem, 2005). The smaller body of victimization research literature is also chiefly comprised of cross-sectional and retrospective data (Teasdale, 2009). Future research that investigates risk factors for adverse outcomes must incorporate more measurement intervals in order to identify true risk factors; that is, assess whether intra-individual changes in the risk factor are associated with intra-individual changes in the odds of occurrence of the adverse outcome. A multi-point assessment of whether variability in specific dynamic risk factors account for changes in the probability of violence *will* provide guidance for clinicians engaged in ongoing decision making, intervention planning, and risk management for individuals whose risk is continually in flux.

Finally, extended research must be conducted to determine why coping competence mitigates the risk of victimization. In particular, studies should explore which types of coping strategies are effective in reducing the likelihood of victimization among males and females respectively. Moreover, because important associations may be lost in the broad categorization of psychiatric diagnosis, it might be fruitful to explore whether particular coping strategies are more (or less) effective among those experiencing particular symptoms.

4.4 Conclusion

The incidence of community violence perpetrated by and against discharged psychiatric patients is disproportional, represents a serious health and safety concern, and has palpable clinical, social and legal implications. Altogether findings from the present study underscore the importance of devising methods to protect people living with MMI from victimization in the community as

well as from committing such acts against others. One of the most efficacious ways to prevent the incidence of these harmful events is through strategic risk management and the accurate prediction of future adverse outcomes. While there have been a number of static risk (and some dynamic) factors identified, there is much work to be accomplished in establishing causal dynamic risk factors for violence and victimization. Understanding the complex ways in which MMI, violence and victimization interrelate must continue to be explored in prospective research. Until the nature of the mechanisms that underlie these associations are known, and interventions and prevention developed, people living with MMI will continue to be unduly vulnerable to the experience of adverse events.

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APPENDIX

Perceived Stress Scale – 10 (Cohen & Williamson, 1988)

Instructions: The questions in this scale ask you about your feelings and thoughts during the past week. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate. For each question choose from the following alternatives:

0 = Never 1 = Almost never 2 = Sometimes 3 = Fairly often 4 = Very often

- _____ 1. In the past week, how often have you been upset because of something that happened unexpectedly?
- _____ 2. In the past week, how often have you felt that you were unable to control the important things in your life?
- _____ 3. In the past week, how often have you felt nervous and "stressed"?
- _____ 4. In the past week, how often have you dealt successfully with irritating life hassles?
- _____ 5. In the past week, how often have you felt that you were effectively coping with important changes that were occurring in your life?
- _____ 6. In the past week, how often have you felt confident about your ability to handle your personal problems?
- _____ 7. In the past week, how often have you felt that things were going your way?
- _____ 8. In the past week, how often have you found that you could not cope with all the things that you had to do?
- _____ 9. In the past week, how often have you been able to control irritations in your life?
- _____ 10. In the past week, how often have you felt that you were on top of things?

Hassles and Uplifts Scale (DeLongis et al., 1988)

HASSLES are irritants- things that annoy or bother you; they can make you upset or angry. UPLIFTS are events that make you feel good; they can make you joyful, glad, or satisfied. Some hassles and uplifts occur on a fairly regular basis and others are relatively rare. Some have only a slight effect, others have a strong effect.

This questionnaire lists things that can be hassles and uplifts in day-to-day life. You will find that during the course of a day some of these will have been only a hassle for you and some will have been only an uplift. *Others will have been both a hassles AND an uplift.*

DIRECTIONS: Please think about how much of a hassle and how much of an uplift each item was for you this **past week**. Please indicate on the left-hand side of the page (under "HASSLES") how much of a hassle the item was by circling the appropriate number. Then indicate on the right-hand side of the page (under "UPLIFTS") how much of an uplift it was for you by circling the appropriate item.

How much of a hassle was this item for
you over the *past week*?

HASSLES

- 0 = None or not applicable
- 1 = Somewhat
- 2 = Quite a bit
- 3 = A great deal

How much of an uplift was this item for you
over the *past week*?

UPLIFTS

- 0 = None or not applicable
- 1 = Somewhat
- 2 = Quite a bit
- 3 = A great deal

Please circle one number on the left-hand side *and* one number on the right-hand side for each item.

Hassles		Uplifts
0 1 2 3	1. Your child(ren)	0 1 2 3
0 1 2 3	2. Your parents or parents-in-law	0 1 2 3
0 1 2 3	3. Other relative(s)	0 1 2 3
0 1 2 3	4. Your spouse	0 1 2 3
0 1 2 3	5. Time spent with family	0 1 2 3
0 1 2 3	6. Health or well-being of a family member	0 1 2 3
0 1 2 3	7. Sex	0 1 2 3
0 1 2 3	8. Intimacy	0 1 2 3
0 1 2 3	9. Family-oriented obligations	0 1 2 3
0 1 2 3	10. Your friend(s)	0 1 2 3
0 1 2 3	11. Fellow workers	0 1 2 3
0 1 2 3	12. Clients, customers, patients, etc.	0 1 2 3
0 1 2 3	13. Your supervisor or employer	0 1 2 3
0 1 2 3	14. The nature of your work	0 1 2 3
0 1 2 3	15. Your workload	0 1 2 3
0 1 2 3	16. Your job security	0 1 2 3
0 1 2 3	17. Meeting deadlines or goals on the job	0 1 2 3
0 1 2 3	18. Enough money for necessities (e.g., food, clothing, housing, health care, taxes, insurance)	0 1 2 3

Hassles	0 = None or not applicable 1 = Somewhat 2 = Quite a bit 3 = A great deal				Uplifts
0 1 2 3	19.	Enough money for education	0	1	2 3
0 1 2 3	20.	Enough money for emergencies	0	1	2 3
0 1 2 3	21.	Enough money for extras (e.g., entertainment, recreation, vacations)	0	1	2 3
0 1 2 3	22.	Financial care for someone who doesn't live with you	0	1	2 3
0 1 2 3	23.	Investments	0	1	2 3
0 1 2 3	24.	Your smoking	0	1	2 3
0 1 2 3	25.	Your drinking	0	1	2 3
0 1 2 3	26.	Mood-altering drugs	0	1	2 3
0 1 2 3	27.	Your physical appearance	0	1	2 3
0 1 2 3	28.	Contraception	0	1	2 3
0 1 2 3	29.	Exercise(s)	0	1	2 3
0 1 2 3	30.	Your medical care	0	1	2 3
0 1 2 3	31.	Your health	0	1	2 3
0 1 2 3	32.	Your physical abilities	0	1	2 3
0 1 2 3	33.	The weather	0	1	2 3
0 1 2 3	34.	News events	0	1	2 3
0 1 2 3	35.	Your environment (e.g., quality of air, noise level)	0	1	2 3
0 1 2 3	36.	Political or social issues	0	1	2 3
0 1 2 3	37.	Your neighbourhood (e.g., neighbours, setting)	0	1	2 3
0 1 2 3	38.	Conserving (gas, electricity, water, gasoline, etc)	0	1	2 3
0 1 2 3	39.	Pets	0	1	2 3
0 1 2 3	40.	Cooking	0	1	2 3
0 1 2 3	41.	Housework	0	1	2 3
0 1 2 3	42.	Home repairs	0	1	2 3
0 1 2 3	43.	Yardwork	0	1	2 3
0 1 2 3	44.	Car Maintenance	0	1	2 3
0 1 2 3	45.	Taking care of paperwork (e.g., paying bills, filling out forms)	0	1	2 3
0 1 2 3	46.	Home entertainment (e.g., TV, music, reading)	0	1	2 3
0 1 2 3	47.	Amount of free time	0	1	2 3
0 1 2 3	48.	Recreation and entertainment outside the home (e.g., movies, sports, eating out, walking)	0	1	2 3
0 1 2 3	49.	Eating (at home)	0	1	2 3
0 1 2 3	50.	Church or community organizations	0	1	2 3
0 1 2 3	51.	Legal matters	0	1	2 3
0 1 2 3	52.	Being organized	0	1	2 3
0 1 2 3	53.	Social commitments	0	1	2 3

Perceived Coping Competency and Efficacy Assessment

Part A.

Instructions: Please think about the most stressful event or situation that you encountered over the past four weeks.

1. Briefly, what was the situation? Why was it stressful?

2. a) We all use certain ways of *behaving* or *thinking* to help cope with a stressful situation – sometimes these strategies help to minimize or overcome the problem, and sometimes they don't work at all.

Usually coping reactions involve emotional responses (such as blaming yourself, or becoming upset), getting away from the problem (such as distracting yourself, or seeking out other people), or problem-solving actions (such as considering different solutions, taking action to solve the problem).

In the table below, briefly describe what you *did* or *thought* when you were dealing with the stressful situation described above.

2. b) Sometimes our coping strategies help to minimize stress or completely resolve a problem, and sometimes they don't seem to work at all. Rate how well your reaction/strategy worked in helping you to manage/resolve the problem. Use the 5-point scale below:

- 1 – Not at all effective
- 2
- 3 – Somewhat effective
- 4
- 5 – Very much effective

Strategy	Not Effective	Somewhat Effective	Effective
1.	1	2	3
2.	1	2	3
3.	1	2	3
4.	1	2	3
5.	1	2	3

Part B.

Instructions: Based on the situation you described above, please rate your agreement with the following statements on a 5-point scale where 1 = *Very Much Disagree*, 5 = *Very Much Agree*.

	Very Much Agree	Very Much Disagree
1. I felt that I had many resources (e.g., support, time) at my disposal to deal with the situation	1 2 3 4 5	
2. The strategies I used were effective in resolving the situation	1 2 3 4 5	
3. I could not find a way to reduce the feeling of stress caused by the situation	1 2 3 4 5	
4. I was satisfied with how I handled the situation	1 2 3 4 5	
5. I was very good at using the strategies I chose to deal with the situation	1 2 3 4 5	
6. I was unable to find a way to solve the problem	1 2 3 4 5	
7. I was confident that I would be able handle the situation	1 2 3 4 5	
8. I handled the situation well given the circumstances	1 2 3 4 5	

MacArthur Classification of Violence Risk (Monahan et al., 2001)

<i>[Note: The reference period for all questions in this grid is the time since the previous assessment]</i>		A. [Yes or No]	B. Where did this happen?	C. Who else was involved in this incident?	D. Was anyone physically hurt (besides you)? [If No, probe -] Not even bruises or cuts?
		0 No [Skip B-E] 1 Yes	<i>[Write answer verbatim and post-code]</i>	<i>[Write answer verbatim and post-code]</i>	0 No 1 Yes 8 RF 9 DK
1	Since we last met, did anyone throw an object at you (pause), push, grab, or shove you? If yes, approx. date: <hr/>	_____	n/a	n/a	n/a
2	Since we last met, did you throw something at anyone? If yes, approx. date: <hr/>	_____	— —	— —	— —
3	Did you push, grab, or shove anyone? If yes, approx. date: <hr/>	_____	— —	— —	— —
4	Since we last met, did anyone slap, kick, (pause), or hit you with a fist or object, (pause) or beat you up, or try to physically force you to have sex? If yes, approx. date: <hr/>	_____ <i>[If Yes, circle act (hit, sex, etc.) to the left]</i>	n/a	n/a	n/a
5	Did you slap anyone? If yes, approx. date: <hr/>	_____	— —	— —	— —

[Note: The reference period for all questions in this grid is the time since the previous assessment]		A. [Yes or No]	B. Where did this happen?	C. Who else was involved in this incident?	D. Was anyone physically hurt (besides you)? [If No, probe--] Not even bruises or cuts?
		0 No [Skip B-E] 1 Yes	[Write answer verbatim and post-code]	[Write answer verbatim and post-code]	0 No 1 Yes 8 RF 9 DK
6	Did you kick, bite or choke anyone? If yes, approx. date: _____	_____	_____	_____	_____
7	Since we last met, did you hit anyone with a fist or beat anyone up? If yes, approx. date: _____	_____	_____	_____	_____
8	Did you try to physically force anyone to have sex against his or her will? If yes, approx. date: _____	_____	_____	_____	_____
9	Since we last met, did anyone threaten you with a knife or a gun or other lethal weapon in their hand (e.g., bat, rock) (pause) or use a knife or gun on you? If yes, approx. date: _____	_____	n/a	n/a	n/a
10	Did you threaten anyone with a gun or knife or other lethal weapon in your hand? If yes, approx. date: _____	_____	_____	_____	_____

<p><i>[Note: The reference period for all questions in this grid is the time since the previous assessment]</i></p>		A. [Yes or No]	B. Where did this happen?	C. Who else was involved in this incident?	D. Was anyone physically hurt (besides you)? <i>[If No, probe--] Not even bruises or cuts?</i>
11	<p>Did you use a knife or fire a gun at anyone? If yes, approx. date: <hr/></p>	0 No [Skip B-E]	<i>[Write answer verbatim and post-code]</i>	<i>[Write answer verbatim and post-code]</i>	0 No 1 Yes 8 RF 9 DK
		1 Yes	— —	— —	— —
12	<p>Did you do anything else that might be considered violent? <i>[specify]</i> <hr/><hr/> If yes, approx. date: <hr/></p>	— —	— —	— —	— —
		— —	— —	— —	— —