THE ROLE OF SOCIAL SUPPORT AND PSYCHOLOGICAL RESOURCES IN DEPRESSION IN PEOPLE LIVING WITH HIV/AIDS: EXAMING THE MEDIATING ROLE OF MASTERY AND SELF-ESTEEM

by

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A thesis submitted in conformity with the requirements for the degree of Master of Arts
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Abstract

The present study explored the influence of social support and psychological resources on depression in people living with HIV/AIDS. The mediating role of mastery and self-esteem was examined. Factor analysis of the MOS-SSS supported three dimensions of social support. Findings from a predominantly gay male sample of unemployed individuals living with HIV/AIDS in the Toronto-area indicated high levels of depressive symptomatology, which were negatively related to emotional/informational support, tangible support, and affectionate/interpersonal support. Mediation analyses indicated partial support of the Cognitive Adaptation Model, revealing significant mediating effects of mastery on the relationship between social support and depressive symptomatology. Self-esteem was not found to be a significant mediator of this relationship. Findings suggest the need for social support interventions that help to strengthen mastery in individuals living with HIV/AIDS in order to reduce depression. Attention should be paid to self-esteem and its relationship with gender and employment status in this population.
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CHAPTER 1

Introduction

HIV/AIDS and depression

The HIV epidemic has evolved with the advancement of available treatment and care options. People are now living chronically with HIV/AIDS and are clinically managed with highly active anti-retroviral therapy (HAART), which has resulted in a significant decrease in HIV-related morbidity and mortality across the globe (Palella, Jr, et al., 1998). People living with HIV/AIDS, however, continue to face complex medical and social challenges including stigma and discrimination, long-term physical discomfort and disability, and eventual death. Recent research on service utilization patterns of people living with HIV/AIDS (PHAs) in Ontario, reported that depressed PHAs used significantly more crisis health care and related services, for example, emergency department, 911, family counsellors, food back services, than non-depressed PHAs (AIDS Committee of Toronto, 2006). The study also found use of medication to be higher in non-depressed PHAs versus depressed PHAs. (AIDS Committee of Toronto, 2006). Identifying supports and services delivered within the community or by health-care teams, that can be effective in treating the complex care of PHAs is greatly needed.

With the evolution of HIV, researchers have been increasingly interested and concerned with how people living with HIV/AIDS have psychologically adjusted to this chronic health condition and what the rates of depression are in this population. Depression is quite common in the medically ill and may exceed that of the general population in those with active medical problems (Evans et al., 1999; Morrison et al., 2002). Estimates of the prevalence of major depressive disorders in people living with HIV/AIDS vary widely in the literature. Reported prevalence rates have ranged from 1.9% to 35% in clinical samples and from 30% to 60% in community samples (Bing et al., 2001). The lifetime prevalence of depression in people living with HIV/AIDS has been estimated at 20 to 45% (Perry, 1994; Penzak, Reddy, & Grimsley,
60% of people living with HIV in Ontario, Canada, may suffer from depression (Williams, et al., 2005a; Williams et al., 2005b). US studies have reported gender differences in prevalence with approximately 30 to 40% of HIV-positive men and 40 to 60% of HIV-positive women experiencing significant depression (Ciesla et al., 2001; Cohen et al., 2002; Ickovics et al., 2001). Rabkin (2008) emphasizes that most people infected with HIV are not depressed most of the time and their resilience is as noteworthy as their psychopathology. The signs and symptoms of depression are similar in HIV-positive and HIV-negative individuals, but HIV-positive individuals may more frequently have sleep and appetite disturbances (Perry, 1994). Depression may also contribute to non-adherence of anti-retroviral therapy (Penzak et al., 2000; Rabkin, 2008), although there is not yet prospective evidence that treatment of depression improves medication adherence among people with self-reported or documented medication non-adherence.

There are possible confounding factors that complicate measuring depression in HIV-positive people. Many symptoms of HIV are similar to somatic symptoms of depression, for example, fatigue, diminished appetite and sleep, physical complaints and weight loss, which could inflate depression rates in symptomatic HIV-positive individuals and increase the vulnerability of many depression rating scales (Drebing et al., 1994). Drebing et al. (1994) compared depression rates of 429 gay and bisexual men divided into three groups: asymptomatic HIV-positive men (n = 156), symptomatic HIV-positive men (n = 156), and a comparison group of HIV-negative men (n = 117). Item analysis between the groups found no significant differences in most of the items addressing depressed affect. Among the items addressing physical symptoms directly associated with HIV, for example, appetite, body weight and nausea, and those addressing items indirectly associated with HIV illness, there were significant differences between groups, the greatest being between symptomatic HIV-positive men and
HIV-negative controls.

Kalichman, Rompa, and Cage (2000) investigated the utility of two self-report depression measures often used in HIV populations, the Beck Depression Inventory (BDI; Beck, Ward, Mendelssohn, & Erbaugh, 1961) and the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). Principal component factor analysis of depression symptoms on the two depression scales was conducted to isolate somatic depression items from non-somatic depression items. When individuals were retested using the “cognitive affective” scales of the measures, that is, the somatic items were excluded, only 14% of individuals were considered depressed using the BDI and 21% were categorized as depressed on the CES-D. There was very little concordance between the measures (50%). Kalichman et al (2000) concluded that removing somatic subsets of depression symptoms improved the clinical utility of the BDI (Beck et al., 1961) and CES-D (Radloff, 1977) and clearer symptom separation occurred with the BDI compared to the CES-D, however the CES-D was more perceptive. The authors also noted that excluding the somatic items would potentially result in reduced sensitivity of the measures to depression resulting in false negatives (Kalichman et al., 2000).

Although the rate of depressive illness and symptoms are high in people living with HIV/AIDS, the causes of depression are not clear. Social, psychological and biological factors have all been suggested as possible causes (Judd et al., 2005). As stated by Rabkin (2008, p.166), it remains to be determined “whether depression puts HIV infected persons at greater risk for disease progression, or whether changes in disease may be associated with increased risk of depression.” Populations at highest risk for HIV infection such as men who have sex with men and people who use injection drugs, have a high prevalence of primary or pre-existing mood disorders. Thus, elevated rates of depression observed after HIV infection may reflect new episodes of pre-existing disorders rather than new-onset depression (Rabkin, 2008). Moneyham et al. (2005) conducted a cross-sectional regression analysis of data collected from 280 rural
women with HIV/AIDS in the South-eastern United States in an attempt to identify risk factors of depressive symptoms. The final regression model included 22 factors that accounted for 69% of the variance in depressive symptoms. The majority of variance in depressive symptoms was accounted for by only six variables including the frequency of HIV symptoms, recent experiences of sadness/hopelessness, the availability of social support, and the use of three coping strategies (living positively with HIV, isolation/withdrawal, and denial/avoidance), suggesting that depressive symptomatology is related to one’s personal orientation or attitude as well as perceived social support or connectedness.

Ciesla et al. (2001) used meta-analytic techniques to demonstrate that HIV infection is associated with a greater risk for major depressive disorder. The frequency of major depressive disorder was nearly two times higher in HIV-positive individuals than in HIV-negative individuals (OR=1.99, 95% CI 1.32-3.00). In the meta-analysis conducted by Ciesla et al. (2001), rates of depression were not related to HIV disease stage. Rabkin’s (2008) review concurs with this stating that in cross-sectional studies, immunologic and virologic markers of HIV progression are not systematically related to rates of depression. In a cohort of 120 Brazilian women living with HIV infection, however, Mello et al. (2006) found that the prevalence of major depressive episodes as measured by the SCID, DSM-IV (American Psychiatric Association, 2000), Hamilton Depression Scale (Hamilton, 1960) and the Beck Depression Inventory (Beck et al., 1961) was high at 25.8%, and women with AIDS-related symptoms were more often depressed than were those who had never presented such symptoms (p=0.002). Leserman et al. (1999) assessed 82 HIV-positive men who have sex with men from the Coping in Health and Illness Project on measures of depression and social support. Men below the median on depressive symptoms as measured by a modified version of the Hamilton Depression Rating Scale (Hamilton, 1960) had a 39% higher probability of being free of AIDS compared with those above the median at the time of measurement. A trend was observed of
depression influencing AIDS progression, although this trend was not statistically significant (Leserman et al., 1999).

Results from longitudinal cohort studies are less clear. Some large cohort studies have found an association between chronic depression and mortality (Cook et al., 2004; Ickovics et al., 2001) while others have found depression to be unrelated to HIV disease progression (Burack et al., 1993) leaving significant equipoise in the literature. The Women’s Interagency HIV Study (Cook et al., 2004) followed 1716 urban women, 40% of whom reported a history of substance use, over a 7-year period measuring depression with the CES-D (Radloff, 1977). About one third of participants reported depressive symptoms CES-D scores > 16 at 75% or more of their visits, and nearly half did so at their last study visit. Chronic depressive symptoms predicted mortality (Cook et al., 2004). Thirteen percent died from AIDS-related causes, compared with 6% or 7% of women with minimal or intermittent depressive symptoms, respectively.

Burack et al. (1993) linked depressive symptoms as measured by the CES-D to CD4 lymphocyte, a measure of immune functioning, decline in a longitudinal, multi-centre AIDS cohort study of 330 gay and bisexual men with HIV. At baseline, 19.7% of the men were identified as depressed and 16.1% were identified as affectively depressed. For these groups, CD4 lymphocytes declined 38%, and 34% faster than non-depressed participants, respectively. However in the analysis, early AIDS diagnosis and mortality appeared to be related to depression, differences were not significant.

Lyketsos et al. (1993) also investigated depression and AIDS progression in 1809 gay and bisexual men as part of the eight-year multi-centre AIDS cohort study (MACS). At baseline, 21.3% of participants were found to be depressed (CES-D score over 16), and those reporting HIV symptoms and having a lower CD4 count were more likely to be depressed (Lyketsos et al., 1993). The survival curve indicated that within 36 to 48 months, a higher proportion of those who were not depressed remained AIDS free, but this was not significant. Depression was found
to be unrelated to a number of HIV health outcomes, including time until AIDS diagnosis, time until death, and CD4 count over the course of the study Lyketsos et al., 1993).

Atkinson et al. (2008) found after two years of follow-up that HIV-positive men who were symptomatic and those with AIDS had a higher incidence of major depression compared to asymptomatic HIV-positive men and HIV-negative matched controls. Progression to AIDS over the two year follow-up was not associated with a diagnosis of major depression. However, CD4 cell count showed a faster decline in those who had a diagnosis of depression during follow-up.

Contrastingly, Leserman et al. (2008), however, found substantial and consistent evidence that chronic depression, stressful events and trauma may negatively affect HIV disease progression in terms of decreases in CD4 T lymphocytes, increases in viral load, and greater risk for clinical decline and mortality. It remains to be seen exactly how major depression and depressive symptomatology relate to HIV disease progression and AIDS-related mortality, and what other factors may be contributing to this relationship.

**Social Support**

Social support is a concept recognizing that people exist to varying degrees in networks through which they can receive and give aid, and in which they engage in interactions (Patel et al., 2005). Although definitions of social support vary in the literature, most include both tangible components, such as, financial assistance and physical aid, and intangible components, such as, encouragement and guidance (Heitzmann & Kaplan, 1988). Different types of social support have been discussed in the literature, for example, informational, instrumental, and emotional (Friedland, Renwick, & McColl, 1996; Sherbourne & Stewart, 1991; Simoni, Huang, Goodry, & Montoya, 2005). Social support can be obtained from family, friends, coworkers, spiritual advisors, health care personnel, or members of one's community or neighbourhood. Several studies have demonstrated that social support is associated with improved outcomes and improved survival in several chronic illnesses, including cancer and end-stage renal disease.
The mechanism by which social support exerts its salutary effects are unknown, but practical aid in achieving compliance, better access to health care, improved psychosocial and nutritional status and immune function, and decreased levels of stress may all play key roles (Uchino et al., 1996; Uchino, 2004). Little is known, however, regarding the exact mechanism through which social support has an effect on health outcomes (Uchino et al., 1996; Uchino, 2004).

Social support has been implicated in the mediation of stressful life events, recovery from illness, and increased program adherence (Heitzmann & Kaplan, 1988). Heller, Swindle, & Dusenbury (1986) described a model explaining the positive effect of social support. Their model includes two key components of social support: esteem-enhancing appraisals and stress-related interpersonal transactions. The esteem-enhancing facet of social support refers to a generalized appraisal, which makes individuals believe that they are cared for and valued and that others are available to them in times of need. The body of literature on social support suggests that the esteem-enhancing component of social support is more important for health maintenance than the more practical, stress-related component (Cohen, Mermelstein, Kamarck, & Hoberman, 1985; Cohen & Willis, 1985; Cohen, Underwood, & Gottlieb, 2000; Heller et al., 1986; Thoits, 1985).

One survey used to measure social support is the Medical Outcomes Survey Social Support Survey (MOS-SSS; Sherbourne & Stewart, 1991), which is a psychometrically tested, multidimensional, self-administered survey that was developed for patients in the Medical Outcomes Study, a two-year study of people with chronic conditions (Tarlov, Ware, Greenfield, Nelson, Perrin & Zubkoff, 1999). The MOS-SSS is brief to administer, but is comprehensive enough to measure a wide range of support that might be utilized when individuals are chronically ill (Sherbourne & Stewart, 1991). The MOS-SSS focuses on what Sherbourne and
Stewart (1991) agree to be the most important dimensions of social support, that is, the perceived availability of functional support rather than structural components.

Perceived social support has received much attention recently (Bisschop et al., 2004; Burgoyne & Renwick, 2004). Studies have found that perceived social support is associated with adjustment to and coping with HIV diagnosis (Friedland et al., 1996; Leserman et al., 1999). Some research has linked social support with HIV disease progression. Leserman et al. (1999) investigated the relationship between depression and progression to AIDS in the Coping in Health and Illness Project. They found that men above the median on social support had a 40% higher probability of being free of AIDS compared with those below the median. Although depressive symptoms were related to increased risk of AIDS, only stress and social support remained significant in the model when the three psychological variables were considered together. Similarly, Patterson et al. (1996) measured HIV disease progression, defined as advance in symptoms, decline in CD4 cell count, and mortality, in 414 HIV-positive men as part of a longitudinal cohort study at the HIV Neurobehavioral Research Center. Findings from the study indicated asymptomatic participants were significantly less depressed than others, and they had larger social support networks than those with symptoms related to HIV disease progression. Neither advance in CD4 count nor AIDS diagnosis were related to any psychosocial factors (Patterson et al., 1996). High depression scores predicted shorter time till death, although when an adapted version of the Hamilton Depression Rating Scale was used omitting somatic symptoms, this relationship failed to be significant. Informational support as measured by the Social Support Questionnaire (Sarason, Levine, Basham, & Sarason, 1983) played a more significant role in those experiencing HIV symptoms at baseline, as it was able to predict time to mortality when depression and social network size were controlled for.

Persson, Gullberg, Hanson, Moestrup, & Ostergren (1994) cross-sectionally assessed psychosocial factors, social network and social support, in relation to measures of immune
functioning in HIV-positive gay men. A low score on two social network indices, social participation and adequacy of social participation, was statistically significantly associated with a low CD4 lymphocyte count. Social support may be an important contributing factor in the relationship between depressive symptomatology and HIV disease progression, a phenomenon that warrants further investigation. It is also an important resource that can enable people living with HIV/AIDS to live with their illness (Goldsmith, Brashers, Kosenko, & O’Keefe, 2008).

**Social Support and Depression**

Many studies have investigated the relationship between depression and one’s social context, including personality style, past psychiatric history, connectedness with community and perceived social support. There is increasing evidence that a strong degree of perceived social support and connectedness may mediate depressive symptomatology. Mills et al. (2004) measured the seven-day prevalence of depression in 2,678 men who have sex with men as part of the Urban Men’s Health Study. This study used a household-based probability sample surveyed across four major American cities, consisting of predominantly HIV-negative individuals (n=1545). Seventeen percent of men were classified as depressed according to the CES-D scale, whereas 12% were classified as distressed. These rates were 17.2% higher than those found in adult U.S. men in general (Mills et al., 2004). Depression was associated with feelings of alienation from the community, lack of a domestic partner, and being HIV-positive, although HIV status was no longer significant when demographic characteristics, developmental history, substance use, sexual behaviour, and current social context were controlled for in logistic regression (Mills et al., 2004).

Specifically related to HIV, there has been increased attention paid to the social environment of people living with HIV as it is believed that the quality of social relationships may be particularly important for successful psychological adaptation to an HIV diagnosis. Mavandadi, Zanjani, Ten Have, & Oslin (2009) sought to explore the relationship between
dimensions of social support and psychological and functional well-being in HIV-positive men and women in different age strata. Subjective and instrumental support, social interaction, behavioural health service utilization, and psychological well-being (i.e., positive affect and depressive symptomatology), and physical functioning were assessed in a cross-sectional design. Despite endorsing greater medical co-morbidity, older adults reported significantly lower depressive symptomatology and greater positive affect and were less likely to report seeing a behavioural health specialist than their younger counterparts. Older adults also reported higher subjective support, which in turn was associated with lower depressive symptomatology, greater positive affect, and non-utilization of behavioural health services.

Vyavaharkar, Moneyham, Corwin, Saunders, Annang, & Tavakoli (2009) examined relationships between HIV-related stigma, social support and depression in a sample of 340 HIV-positive African American women living in rural areas of the South-eastern United States. Three aspects of social support, including availability of different types of support, sources of support and satisfaction with support, and two aspects of HIV-related stigma, perceived stigma and internalized stigma, were measured using a cross-sectional design. The authors proposed a mediation model whereby stigma mediates the relationship between social support and depression. Perceived availability of support (p < .0001), sources of support (p=.03), satisfaction with support (p=.003), perceived stigma (p < .0001), and internalized stigma (p < .0001) were all significantly negatively correlated with depressive symptoms (Vyavaharkar et al., 2009). Social support variables were negatively correlated and stigma variables were positively correlated with depression. HIV-related perceived stigma and internalized stigma were found to mediate the relationship between sources of available social support and depression. Similar to the studies cited above (Vyavaharka et al., 2009), a significant body of literature has drawn a link between social support and depression whereby changes in emotional support from friends and family as well as practical and informational dimensions of social support are negatively correlated with

Although unsupportive social interactions have demonstrated strong relations with psychological adjustment to illness, little research has been directed at the differential effects of unsupportive interactions from different relationship sources, such as, family, friends, or a lover/spouse. Schrimshaw (2003) examined whether the source of unsupportive social interactions had direct and interactive relations with depressive symptoms among 146 ethnically diverse women living with HIV/AIDS. After controlling for numerous demographic characteristics (race/ethnicity, disease stage, household income, education, age and physical symptoms), unsupportive social interactions from family were found to have a main effect predicting more depressive symptoms. Furthermore, a significant interaction was identified between unsupportive interactions from a lover/spouse and from friends, such that high levels of unsupportive interactions from either or both sources predicted high levels of depressive symptoms. Thus, the experience of unsupportive relationships with a lover/spouse or friends, was shown to have detrimental effects on the psychological adjustment of women with HIV/AIDS. Hays et al. (1992) conducted similar research for a sample of 508 gay men, 50% of whom were HIV-positive. Satisfaction with social support, including emotional ($r = -.367, p < .001$), practical ($r = -.284, p < .001$) and informational ($r = -.329, p < .001$), was inversely correlated with depression. Men who were more satisfied with the social support they received were less likely to show depressive symptomatology at one year later. Multiple regression analysis indicated a symptom by informational support interaction. Experiencing more HIV
symptoms was associated with greater depression among gay men with low informational support (Hays et al., 1992).

Numerous studies have linked social support to better medication adherence among illness groups, but few have examined potential mechanisms for this relationship. Gonzalez et al. (2004) examined relationships between social support, depression, positive states of mind (PSOM), and medication adherence among an ethnically-diverse sample of HIV-positive men who have sex with men (n=61) and women (n=29) on highly active antiretroviral therapy. Depression and PSOM were evaluated as potential mediators of the relationship between support and adherence. Cross-sectional data showed that greater social support and PSOM related to better adherence whereas higher depression scores related to non-adherence (Gonzalez et al., 2004). Perceived quality of social support, as measured by the Social Provisions Scale (Cutrona & Russel, 1987), was also associated with less depressive symptomatology and higher levels of PSOM. PSOM partially mediated the relationship between social support and adherence, which highlights PSOM as a potential important mechanism through which social support is related to better HIV medication adherence (Gonzalez et al., 2004).

In order to further understand how social support impacts depression in the context of HIV/AIDS, some research has investigated potential factors linking these two constructs. Using multiple regression, Fleishman et al. (2000) simultaneously examined the joint effects of coping, conflictual interactions, and social support on positive and negative mood among 300 HIV positive participants (70% male; 71% white). This study demonstrated that perceived support had significant correlations with positive mood ($r = 0.374$) and with negative mood ($r = -0.276$), but it had relatively weak and non-significant effects on mood when coping and other social relationship variables were controlled for. In addition, optimism had significant direct effects on both positive and negative mood. Factor analyses showed that perceived social support and conflictual social interactions formed separate factors and were not strongly related. Compared
to perceived social support, social conflict was more strongly related to coping behaviours, especially to social isolation, anger, and wishful thinking. Conflictual social interactions were more strongly related to negative mood than was perceived social support. One explanation offered for the weak relationship of perceived support with coping and mood was that the perceived support scale used in Fleishman’s study (2000) contained a high proportion of items reflecting tangible support, while prior studies have emphasized emotional support. Fleishman argued the need for further research to specify the manner in which support and coping combined to influence psychological outcomes.

Research conducted by Grassi, Righi, Sighinolfi, Makoui, & Ghinelli (1998) supports the hypothesis that coping with HIV infection is a complex phenomenon involving multiple and interacting variables. The purpose of their study was to evaluate the association of coping, particularly the fighting-spirit-hopelessness dimension, with psychological stress symptoms, social support and personality variables in HIV-positive men and women. The study indicated that people who were adjusting well to their HIV-positive status tended to have a higher level of fighting spirit and a lower degree of hopelessness compared to those not adjusting well to their HIV-positive status. A coping style based on incapacity to face and confront HIV infection was associated with symptoms of psychological stress, repression of anger, external locus of control, and low social support in those not adjusting well to living with HIV. These individuals exhibited lower fighting spirit and social support, and higher hopelessness, fatalistic attitude, anxious preoccupation and expression of sadness. These results demonstrate that one’s orientation or attitude may significantly impact psychological adjustment to stress or challenging situations, for example, adjustment to HIV infection.

Neff, Amodei, Valescu, & Pomeroy (2003) further illustrated this hypothesis by examining the relative importance of general individual orientations, for example, sense of self-worth, or self-esteem, and personal control over one’s environment, or mastery, with regard to
psychological distress among women living with HIV. Multiple regression analyses yielded robust effects of personal resources including self-esteem and mastery in relation to depression ($\beta = -0.47$, $p<0.05$ and $\beta = -0.32$, $p<0.05$, respectively). Although these results should be taken with caution because of the small sample size of 32 HIV-positive Latina women and the largely exploratory analysis, this pilot study warrants further investigation of the role of personal resources or psychological resourcefulness (Simoni et al., 2005), specifically, self-esteem and mastery, in mediating depressive symptomatology; and the research carried out by Fleishman et al. (2000), Grassi et al. (1998) and Neff et al. (2003) highlight the complex pathway linking perceived social support and depressive symptomatology in the context of living with HIV/AIDS.

**Mediation Models**

Research has suggested that psychological resourcefulness, for example mastery and self-esteem, may mediate the relationship between social support and psychological well-being (Kalichman, 2000; Simoni et al, 2005). One model used to explain this process is the cognitive adaptation model developed by Taylor (1983). The cognitive adaptation model proposed that individuals who experience personal setbacks or tragedies (for example, cancer, heart attack, HIV-infection), respond with cognitively adaptive efforts that may enable them to exceed or return to their previous level of psychological functioning (Taylor, 1983). Taylor proposed that these adaptive efforts revolve around three themes, including, (1) search for meaning in the experience, (2) attempts to regain mastery over the event and/or one’s life, and (3) attempts to enhance one’s self-esteem (i.e., feel good about oneself again) despite the personal setbacks.

Similarly, Pearlin, Menaghan, Lieberman, and Mullan (1983) hypothesized that self-esteem and mastery, or personal control, mediates the effects of social support in individuals experiencing stress, or in populations with uniformly high levels of stress, for example individuals with a chronic illness. This theory proposes that social support increases the levels of
individual or psychological resources, which then in turn reduce psychological distress (Pearlin et al., 1983).

One of the most widely used methods to test mediation is the Baron and Kenny criteria (1986). Baron and Kenny (1986) propose a causal model of mediation whereby a mediator variable, sometimes referred to as an intervening or process variable, interacts in the relationship between an initial variable (e.g. an exposure or risk factor) and an outcome of interest. The mediator variable is presumed to cause the outcome of interest, and not vice versa. There is a long history in the study of mediation, especially in order to understand the mechanism through which an initial variable affects an outcome of interest (Hyman, 1955; MacCorquodale & Meehl, 1948). Baron and Kenny (1986) and Judd and Kenny (1981) propose steps in establishing mediation including: (a) demonstrate correlation between the initial variable and the outcome of interest; (b) demonstrate correlation between the initial variable and the mediator variable; (c) demonstrate causal affect of the mediator variable on the outcome of interest; and (d) establish that the mediator variable completely mediates the relationship between the initial variable and the outcome of interest statistically via significance testing. Mediation models can be explored and estimated statistically through multiple regression, logistic regression, multilevel modeling and structural equation modelling. If there are multiple mediators, for example, more than one personal resource including self-esteem and mastery, they can be tested simultaneously or separately taking caution that the different mediators are conceptually distinct and not too highly correlated (Kenny et al, 1998). MacKinnon (2008) uses the Baron and Kenny (1996) steps with additional significance testing for multiple mediator models, using regression equations and confidence limits.

**Self-Esteem**

Self-esteem is regarded as a personal and internal resource similar to resiliency that is employed during times of stress (Simoni et al., 2005), and has been demonstrated to predict
health and well-being in a number of samples and domains (Juth, Smyth, & Santuzzi, 2008).

Research has been done to examine the relationship between social support, self-esteem and depressive symptoms in the context of different chronic diseases, as well as how social support and self-esteem supplement each other additively in relation to psychological functioning. It is believed that social and psychological resources tend to enrich each other, for instance, people with high self-esteem may be more likely to receive or perceive more social support.

Alternatively, social support may strengthen a person’s self-esteem and may be particularly important in reducing depressive symptomatology or when dealing with a stressful situation (Druley & Townsend, 1998; Hall, Kotch, Browne, & Rayens, 1996; Symister & Friend, 2003).

There is increasing recognition that self-esteem is a multidimensional construct even though unidimensional measures of global self-esteem have been most often employed in research studies (Katz, Rodin, & Devins, 1995). Despite its wide-spread use, the underlying measurement structure and dimensionality of the six-item Rosenberg Self-Esteem Scale (Rosenberg, 1965) is still debated. Richardson, Ratner, & Zumbo (2009) investigated these issues using self-esteem data completed as part of the National Population Health Survey of Canada. This study found that the six-items in the scale measure two correlated dimensions of global self-esteem including a measure of self-competence and a measure of self-liking. Subsequent tests of predictive power and discriminant validity supported the two-dimension interpretation. The two dimensions had substantially different relationships with theoretically-related measures of anxiety, negative affect and happiness. In addition to these different correlations, latent variable regressions indicated that the self-competency factor consistently suppressed irrelevant variance in the self-liking factor when predicting anxiety, negative affect and happiness, supporting the notion that the Rosenberg Self-Esteem Scale (Rosenberg, 1965) is a multi-dimensional measure of global self-esteem (Richardson et al., 2009).
Schroevers, Ranchor, & Sanderman (2003) conducted a longitudinal study to determine the role of social support (i.e. perceived availability of emotional support, lack of received problem-focused emotional support, and negative interactions) and positive and negative self-esteem in depressive symptomatology as measured by the CES-D comparing cancer patients and individuals from the general population. This study found that social support and self-esteem were weakly to moderately related to each other ($r = .027, p < .001$), both in cancer patients and in the general population comparison group. Compared to positive self-esteem, negative self-esteem was more strongly related to social support. Regression analyses showed that social support and self-esteem were independently and concurrently related to depressive symptoms, in that lower levels of social support and self-esteem were strongly related to higher levels of depressive symptoms. Thus, these personal resources tended to supplement each other additively.

The question has been raised as to whether social and personal resources, instead of supplementing, augment each other interactively in their effects on psychological well-being. However, the empirical evidence for such an interaction between social and personal resources is weak. Overall, the findings of Schroevers et al. (2003) research favour the idea that resources supplement each other.

The relationship between positive health practices and social support, self-esteem, and optimism have also been examined (McNicholas, 2002), along with the relationship between social support and self-esteem and between social support and optimism. McNicholas (2002) tested two alternative mediation models with self-esteem in Model 1 and optimism in Model 2 to help explain the relationship between social support and positive health practices in middle-aged adults. The five correlational hypotheses were supported. Social support, self-esteem, and optimism were all positively related to positive health practices, and social support was positively related to self-esteem and optimism.

The mediating role of self-esteem in the relationship between social support and
depressive symptomatology in the context of HIV/AIDS has not yet been fully elucidated. Naturalistic exploration of mechanisms relating self-esteem to physiological and/or psychological components in illness may clarify causal relationships and inform theoretical models of self-care, well-being, and disease management (Juth et al., 2008).

Mastery

Mastery has been defined as “the extent to which one regards one’s life-chances as being under one’s own control in contrast to being fatalistically ruled” (Pearlin & Schooler, 1978). Similar to self-esteem, mastery is a construct that is multi-dimensional in nature. Using covariance structure modeling, Marshall (1991) demonstrated that internal health locus of control comprises multiple dimensions that are differentially associated with physical health status. Dimensions included the recognition that illness prevention and management are contingent on successful execution of potential health actions as well as self-mastery over health outcomes, that is, the perceived capacity to achieve desired health outcomes. Only perceptions of self-mastery were independently associated with indexes of physical health and well-being.

The association between mastery and depression has been explored in literature related to stress and coping in the context of chronic disease. Thompson, Sobolew-Shubin, Galbraith, Schwankobsky, & Cruzen (1993) sought to understand the role of perceived control in coping with a major life stressor in a sample of 71 cancer patients. As hypothesized, those with greater perceptions of control were less depressed, even when physical functioning, marital satisfaction, and negative affectivity were controlled for, indicating that even when dealing with a physical or psychosocial challenge, people were better adjusted if they had higher perceptions of control. In the context of HIV/AIDS, Gray & Cason (2002) investigated the relationship between stressors and psychosocial resources including mastery and social support in 80 HIV-positive women. This research demonstrated that mastery over stress had a strong positive correlation with social support indicating that stress was decreased when social support was high. Perceived stress
intensity was significantly correlated with social support, such that stress was minimized with increased social support. Multiple regression analysis indicated that HIV-positive women were more likely to experience mastery over stress when social support ($t=6.85$, $p=.000$) and spiritual perspective ($t=2.71$, $p=.008$) were high.

**Social Support and Depressive Symptomatology Mediated by Personal Resources**

Psychological beliefs such as optimism, personal control and a sense of meaning are known to be protective of mental health. In reference to the coping efforts of people living with cancer, Taylor (1983) proposed a theory of cognitive adaptation to threatening events arguing that the adjustment process centers around three themes: a search for meaning in the experience, an attempt to regain mastery over the event in particular and over one's life more generally, and an effort to restore self-esteem through self-enhancing evaluations. Taylor (1983) maintains that successful adjustment depends on the ability to sustain and modify illusions that buffer not only against present threats but also against possible future setbacks.

Some research has adjusted the cognitive adaptation model proposed by Taylor (2003) in an attempt to explain the mediating role of personal resources in the association between social support and depression symptomatology. Bisschop et al. (2004) measured social support including partner status, network size, instrumental support, emotional support and loneliness and personal resources in 2288 healthy and chronically ill individuals to determine the impact of these resources on depressive symptoms as measured by the CES-D. The study demonstrated that having a partner, feeling less lonely, having more self-esteem and more feelings of self-efficacy and mastery were all associated with less depressive symptoms. Social network size failed to show a relationship with depression. Furthermore, having a partner, high self-esteem, mastery, self-efficacy and feeling less lonely buffered the negative effect of some, but not all, specific chronic diseases on mood.
Similarly, Pennix et al. (1997) explored the impact of stress, social support and personal resources on physiological well-being in a community-based sample of 1690 older persons of whom 719 had no chronic disease, 612 had mild arthritis and 359 had severe arthritis. Structural social support as indicated by having a partner and many close relationships had a direct effect on mood as measured by the CES-D, while functional support, as indicated by receiving social support and many diffuse relationships, played a buffering role in those experiencing arthritis. Feelings of mastery and self esteem had direct effects on depression, and mastery played a buffer role for those with arthritis (Pennix et al., 1997). Other research has examined the determinants and correlates of psychological distress focusing on the roles of psychological or personal resources including social support, self-esteem and mastery in mediating the effects of life stressors. These studies have found that higher levels of social support with mediation from mastery and self-esteem are associated with less depressive symptoms for both men and women, especially in the context of chronic illness and disability (Cott, Gignac, & Badley, 1999; Dalgard, Mykletun, Rognerud, Johansen, & Zahl, 2007; Gadalla, 2009a; Gadalla, 2009b; Green & Rodgers, 2001; Hobfoll & Walfisch, 2003; Jang, Haleym, Small & Mortimer, 2002; Matire, Stephens, & Townsend, 1998).

Fukukwawa, Tsuboi, Niino, Ando, Kosugi, & Shimokata (2000) also examined the relationship between social support, self-esteem and depression in a sample of 1,116 Japanese men and women aged 40 to 79. Structural equation modelling was employed in which depressed affect was predicted directly from social support and indirectly mediated through self-esteem. Contrary to the researchers’ expectations, social support had no significant direct relation to depressed affect ($r = .03$). Structural equation modelling demonstrated that social support reduced depressed affect through an increase in self-confidence and a decrease in self-deprecation. In this regard, social support appeared to influence depressed affect only when mediated by self-esteem.
In the specific context of living with HIV/AIDS, Taylor, Kemeny, Reed, Bower, & Gruenewald (2000) sought to explore whether the psychological beliefs and positive illusions proposed in the cognitive adaptation theory were protective of physical health among men living with HIV revealing that even unrealistically optimistic beliefs about the future may be health protective. The ability to find meaning in the experience was associated with a less rapid course of illness, suggesting that psychological beliefs such as meaning, control, and optimism act as resources, which may not only preserve mental health in the context of traumatic or life-threatening events, but be protective of physical health as well.

Taylor’s Cognitive Adaptation Model

Simoni et al. (2005) explored how social support as well as psychological resourcefulness in the form of enhanced self-esteem and mastery served to decrease depressive symptomatology in a sample of ethnically-diverse HIV-positive women from New York City. They hypothesized that social support would be negatively correlated with depressive symptomatology and that self-esteem and mastery would mediate this association. Structural equation modelling was used to test the multivariate model of the association between social support and depressive symptomatology. Simoni et al. (2005) related the mediating effects of the psychological resources of self-esteem and mastery to the cognitive adaptation theory proposed by Taylor (1983) whereby “prominent themes in confronting a life-threatening illness involve, in addition to the search for meaning, attempts to enhance one’s self-esteem and efforts to gain mastery and control over the illness” (Simoni et al., 2005, p. 3). Depressive symptomatology was measured using the CES-D (Radloff, 1977), the Rosenberg Self-Esteem Scale (Rosenberg, 1965) and the Pearlin Mastery Scale (PMS; Pearlin & Schooler, 1978) to evaluate mastery were used to measure psychological resourcefulness. Structural equation modelling supported the hypothesis that increased receipt of HIV-related social support was negatively correlated with depressive symptoms. The association between these two variables was mediated by psychological
resourcefulness, specifically self-esteem and mastery, in that women in receipt of social support experienced an increase in self-esteem and a decrease in psychological distress. Mastery was associated with greater social support and less depression (Simoni et al., 2005). This study’s overall findings suggest that interventions that enhance social support for women with HIV/AIDS, or that target mastery and self-esteem more directly, may be successful in reducing depression.

The Present Study

The present study was designed to corroborate and expand upon the work of Simoni et al. (2005), using the cognitive adaptation model by Taylor (1983) to explore the mediating effects of psychological resources on the relationship between social support and depressive symptomatology. The cognitive adaptation model suggests that individuals attempt to regain mastery and restore self-esteem in response to an illness or traumatic event (Taylor, 1983). While the research conducted by Simoni et al. (2005) focused on women with HIV, mainly of African-American and Puerto Rican decent, the present study expands the research to a predominantly Canadian population of gay and bisexual men who are living with HIV/AIDS in the Toronto-area. Further evaluating the relationships between social support, mastery, self-esteem and depression will help to guide interventions provided by health-care teams, AIDS Service Organizations, or individual therapists, targeted at improving the mental health of PHAs. This study also explores the reliability and validity of the Medical Outcomes Study Social Support Survey within a HIV-infected population. Based upon the findings of previous researchers, the following hypotheses are proposed:

**Objective 1: Testing the reliability and validity of the MOS-SSS.**

Hypothesis 1: Consistent with Sherbourne and Stewart (1991), the MOS-SSS is a reliable and valid measure of global social support, emotional/informational support, tangible support, affectionate support and positive social interaction.
**Objective 2: Investigating the mediating effects of psychological resources on the**

relationship between social support and depressive symptoms in individuals living with HIV/AIDS.

Hypothesis 2: Consistent with previous research (Simoni et al., 2005; Mavandadi et al., 2009; Mills et al., 2004), social support is negatively correlated with depressive symptomatology, in people living with HIV/AIDS.

Hypothesis 3: Consistent with Simoni et al. (2005), the relationship between each dimension of social support (emotional/informational support, tangible support, affectionate support, and positive social interaction) and depressive symptoms is mediated by psychological resources, as measured by mastery and self-esteem. Mastery and self-esteem are expected to further reduce depressive symptomatology in individuals with HIV/AIDS, specifically through the mediation of social support.
CHAPTER 2
Study Design and Methodology

Participants

This study is a secondary data analysis of a sample of 125 individuals living with HIV/AIDS in the Toronto-area. The study was originally designed to prospectively examine the effects of return-to-work on health-related quality of life in people living with HIV/AIDS, in addition to examining factors that influence return-to-work in individuals seeking or planning to seek employment (Mustard, C., Rueda, S., Lavis, J. Bayoumi, A., Raboud, J., & Rourke, S.B., Unpublished). The study’s purpose was to investigate whether stable employment had a greater effect on health-related quality of life in PHAs, compared to intermittent or absence of employment. The study further evaluated predictors of return-to-work in PHAs, including job-search motives, job-search competencies, job-search constraints, and job-search intensity (Mustard et al, 2003). The present study extends analyses beyond the scope of the original study, evaluating the relationship between social support, mastery, self-esteem, and depression in PHAs.

Table 1 provides demographic information on study participants. The sample consists of 125 individuals. Of these, 113 identified as male, 12 identified as female. Participants ranged in age from 23 to 64, with a mean age of 41.8 years (SD = 8.1). The majority of the sample identified their ethnic background as Caucasian (60.8%), with the remaining participants identifying as African (15.2%), Hispanic (8.8%), Caribbean (4.0%), Aboriginal (2.4%), Central Asian (1.6%), South Asian (1.6%), and “Other” (4.0%). Participants predominantly identified English as their first language (74.4%), and Canada as their country of origin (56.0%). All participants were unemployed at baseline, with the majority of individuals reporting an average
personal monthly income of less than $2,000 (92.7%). The majority of participants identified their sexual orientation as gay or lesbian (71.2%), with others identifying as heterosexual (19.2%), or bisexual (9.6%). None of the participants in this sample identified as transgendered or transsexual. Individuals were primarily single (60.0%), with 15.2% living with a partner, 10.4% married, 5.6% divorced, 3.2% separated, 3.2% widowed, and 2.4% identified as common law. Participants were asked to provide disease status markers, including recent CD4 count and viral load. Disease status cannot be determined owing to a large amount of missing data. One hundred and six individuals indicated their most recent CD4 count (M = 509.7, SD = 276.4), and forty-three individuals indicated their most recent viral load (M = 121,515, SD = 611,766).
Table 1

Demographics and disease status at time 1 (N = 125)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequencies or Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD) age</td>
<td>41.8 (8.1)</td>
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<tr>
<td>Male</td>
<td>113 (90.4%)</td>
</tr>
<tr>
<td>Mean (SD) years of education</td>
<td>14.7 (2.9)</td>
</tr>
<tr>
<td>Ethnicity (n=124)</td>
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</tr>
<tr>
<td>Caucasian</td>
<td>76 (60.8%)</td>
</tr>
<tr>
<td>African</td>
<td>19 (15.2%)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>11 (8.8%)</td>
</tr>
<tr>
<td>Caribbean</td>
<td>5 (4.0%)</td>
</tr>
<tr>
<td>Aboriginal</td>
<td>3 (2.4%)</td>
</tr>
<tr>
<td>Central Asian</td>
<td>2 (1.6%)</td>
</tr>
<tr>
<td>South Asian</td>
<td>2 (1.6%)</td>
</tr>
<tr>
<td>Other</td>
<td>5 (4.0%)</td>
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<tr>
<td>Native Language (n=119)</td>
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<tr>
<td>English</td>
<td>93 (74.4%)</td>
</tr>
<tr>
<td>French</td>
<td>4 (3.2%)</td>
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<tr>
<td>Other</td>
<td>22 (17.6%)</td>
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<tr>
<td>Born in Canada</td>
<td>70 (56.0%)</td>
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<tr>
<td>Sexual Orientation</td>
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<tr>
<td>Gay/Lesbian</td>
<td>89 (71.2%)</td>
</tr>
<tr>
<td>Heterosexual</td>
<td>24 (19.2%)</td>
</tr>
<tr>
<td>Bisexual</td>
<td>12 (9.6%)</td>
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<tr>
<td>Transgendered/Transsexual</td>
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<tr>
<td>Marital status</td>
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<tr>
<td>Single</td>
<td>75 (60.0%)</td>
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<tr>
<td>Living with partner</td>
<td>19 (15.2%)</td>
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<tr>
<td>Married</td>
<td>13 (10.4%)</td>
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<tr>
<td>Divorced</td>
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<td>Separated</td>
<td>4 (3.2%)</td>
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<tr>
<td>Widowed</td>
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<tr>
<td>Common law</td>
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<tr>
<td>Monthly average personal income (n=124)</td>
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</tr>
<tr>
<td>&lt; $1,000</td>
<td>38 (30.6%)</td>
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<tr>
<td>$1,000 – $1,999</td>
<td>77 (62.1%)</td>
</tr>
<tr>
<td>$2,000 – $3,999</td>
<td>8 (6.5%)</td>
</tr>
<tr>
<td>&gt; $4,000</td>
<td>1 (0.8%)</td>
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<tr>
<td>Mean (SD) disease status</td>
<td></td>
</tr>
<tr>
<td>CD4 count (n=106)</td>
<td>509.7 (276.4)</td>
</tr>
<tr>
<td>Viral load (n=43)</td>
<td>121,515 (611,766)</td>
</tr>
</tbody>
</table>
Measures

The questionnaire package included the following measures, which can be found in Appendix B.

**Depressive symptomatology**

The 20-item Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) was administered to participants to assess symptoms of depression. The CES-D is a non-diagnostic, self-report measure of current depressive symptomatology in the general population, with an emphasis on the affective component of depression (Radloff, 1977). The CES-D has been utilized to assess depression in populations with chronic disease including multiple sclerosis, cancer, renal disease and HIV/AIDS (Devins et al., 1988; Burack et al., 1993; Lyketsos et al., 1993; Page-Shafer, Delorenze, Satiriano, & Winkelstein, 1996; Ickovics et al., 2001; Mills et al., 2004; Patten, Lavorato, & Metz, 2005). The CES-D was chosen over other measures of depression in an attempt to control for the possible confounding affect of AIDS-related symptoms, which can significantly overlap with the somatic component of depression (Lyketsos et al., 1993). The items ask participants to rate the presence in the past week of 20 signs or symptoms of depression, on a 4-point Likert scale based on the frequency of symptom occurrence (0 = rarely or none of the time [less than one day in the past week]; 1 = some or a little of the time [one to two days a week]; 2 = occasionally or a moderate amount of time [three to four days a week]; 3 = most or all of the time [five to seven days a week]). Total CES-D scores range from 0 to 60. Cut-off scores for presence of clinical or severe depression in the literature range from 16 to 22 (Gershon et al., 1986; Lyketsos et al., 1993; Lyketsos et al., 1996; Simoni et al., 2005). Given that AIDS-related symptoms were not measured in the present study, a more conservative cut-off of 22 was used as a marker of clinical depression (Lyketsos et al.,
This measure has been widely demonstrated to have good internal reliability ($r = .85$), test-retest reliability ($r = .57$) and validity ($r = .69$ to .75) (Radloff, 1977).

**Social support**

The Medical Outcomes Study Social Support Survey (MOS-SSS; Sherbourne & Stewart, 1991) was administered to participants to evaluate overall and specific dimensions of social support. The MOS-SSS is a 19-item scale designed to measure perceived availability of support across four dimensions, including, emotional-informational, affectionate, tangible, and positive social interaction. The MOS-SSS was developed out of the Medical Outcomes Study, a two-year longitudinal study assessing process and outcomes of care for patients with chronic conditions (Sherbourne & Stewart, 1991). The measure is focused on perceived availability of support based on the work of Cohen and Willis (1985). The authors’ note that an individual not currently receiving support at a given time is not necessarily unsupported, just as someone who appears to have access to support may not have the perception that they are in fact supported. Participants are asked to rate the availability of companionship, assistance and other types of support on a 5-point Likert scale (1 = none of the time, 2 = a little of the time, 3 = some of the time, 4 = most of the time, 5 = all of the time). Examples of items from each of the measure’s four dimensions include, “someone you can count on to listen to you when you need to talk” (emotional/informational support), “someone to help you if you were confined to bed” (tangible support), “someone who shows you love and affection” (affectionate support), and “someone to have a good time with” (positive social interaction). Item 19 is included in the total score calculation, but is not a part of any of the four subscales. Higher scores indicate higher perceived availability of social support. Reliability for the MOS-SSS total score and four subscales range from $r = .91$ to .97, and are stable over time (12 months). A coefficient alpha of 0.96 was obtained in the present sample. The authors report multitrait scaling analysis that supports four
dimensions of functional support and an overall social support index. Good construct validity is reported for the MOS-SSS (Sherbourne & Stewart, 1991).

**Mastery**

The Pearlin Mastery Scale (PMS; Pearlin and Schooler, 1978) was administered to participants to evaluate personal control or mastery. Mastery is defined by the authors as the extent to which an individual considers their “life chances” as being under their own control as opposed to being fatalistically determined. The seven items ask participants to rate their agreement on a number of personal control belief statements, based on a 4-point Likert scale (1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree). Examples of items include, “there is really no way I can solve some of the problems I have” and “what happens to me in the future mostly depends on me.” Items one through five are scored as follows: strongly agree = 1 point, agree = 2 points, disagree = 3 points, strongly disagree = 4 points. Items six and seven are reverse scored. The PMS total range of possible scores extends from 7 (low mastery) to 28 (high mastery). Higher scores indicate a greater sense of mastery. This widely used scale has been shown to have high internal reliability ($r > .75$) (Folkman et al., 1986).

**Self-esteem**

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was administered to participants to measure self-appraisal or self-esteem. It has been noted that this scale is the most frequently used measure of global self-esteem in the literature (Blascovich, J. & Tomaka, J., 1991; Simoni et al., 2005). This 10-item scale asks participants for their level of agreement on a number of statements of positive and negative self-appraisal, based on a 4-point Likert scale (1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree). Examples of items include, “on the whole, I am satisfied with myself” and “I certainly feel useless at times.” Items 2, 5, 6, 8, and 9 are scored as follows: strongly agree = 1 point, agree = 2 points, disagree = 3 points, strongly disagree = 4 points. Items 1, 3, 4, 7, and 10 are reverse scored. Research with HIV populations
have found the Rosenberg Self-Esteem Scale to have good internal consistency ($r > .80$; Siegel & Schrimshaw, 2005; Schrimshaw, E. W., 2009) and good validity (Rosenberg, 1965).

**Demographic information**

Demographic information was assessed as a part of the questionnaire package administered to participants, including participant age, gender, ethnicity, country of birth, marital status, sexual orientation, level of education, income, and HIV health status markers. These questions and others included in the primary return-to-work study are presented in Appendix B.

**Procedure**

As a part of the primary study by Mustard et al. (2003), individuals were recruited in 2004 – 2007 through flyers placed at eight AIDS Service Organizations (ASOs) and community centres in the Toronto-area, including the AIDS Committee of Toronto, the Toronto People with AIDS Foundation, the Positive Care Clinic, Sherbourne Family Practice Clinic, Maple Leaf Medical Clinic, 519 Church Street Community Centre, Family Service Association of Toronto, and the David Kelley HIV/AIDS Community Counselling Program. Participants were also referred to the study through the Employment Action Program of the AIDS Committee of Toronto. Finally, study advertisements were placed in a local Toronto newspaper. A copy of the generic information sheet provided to potential participants either in person, or over the phone, can be found in Appendix A. Potential participants who were referred or contacted the study coordinator were screened to determine their eligibility. Individuals were eligible for the study if they: 1) reported being HIV-infected, 2) lived in the greater Toronto-area, 3) had been unemployed for a period of at least three months, 4) were interested in returning to work, and 5) were 18 years of age or older.

Participants were required to attend a total of nine study visits, every three months, at the Neurobehavioural Research Unit, Mental Health Research of Saint Michael’s Hospital in Toronto. Individuals were asked to complete the informed consent process at the first study visit.
(see Appendix C). At each visit, participants completed a questionnaire package (see Appendix B) with the study coordinator. The questionnaire package included additional measures for the purposes of the primary study, which are beyond the scope of the present analyses. The study materials took approximately 30 to 60 minutes to complete. Participants were remunerated in the amount of $25.00 for each study visit attended.

The original study was approved by the Research Ethics Board at St. Michael’s Hospital. The present study was approved by the Ethics Review Office at the University of Toronto. Participants were assured of their anonymity and confidentiality throughout the study visit, and were aware of their right to discontinue the study at any time. They were instructed to take as much time as needed in answering the questionnaire items and were able to ask the study coordinator for clarification at any point during the visit. The study coordinator double-checked each questionnaire to prevent missing data. Participants were assigned a research ID number, which appeared on each page of all of their completed questionnaires. Contact information was collected for the purposes of scheduling future study visits and was kept separately from completed questionnaires. Individual contact information will be kept only for the duration of the study at which time it will be destroyed. For the duration of the study, participant contact information will be kept in a separate locked filing cabinet, only accessible to the study investigators and study coordinator. The completed questionnaires are also kept in a separate locked filing cabinet with the same access restrictions.

**Planned Analyses**

For the purposes of this study, data collected at the first (baseline) and second (three-month follow-up) study visits are used in analyses. Objective 1 was assessed in two stages. The first step examined the internal consistency among the MOS-SSS 19 items. The second step involved evaluating the measure’s construct validity through exploratory factor analysis, to investigate the presence of four distinct dimensions of perceived social support among the study
population. Objective 2 was initially assessed through preliminary correlational analyses, which was then followed by tests for mediation effects.

**Reliability: Internal consistency of the MOS-SSS**

The internal consistency of the MOS-SSS was assessed by obtaining coefficient alpha values for the overall 19-item scale. In general, values below .60 are considered poor, values from .60 to .69 are minimally acceptable, values from .70 to .79 are moderate or acceptable, values from .80 to .89 are considered good, and values above .90 are excellent (Nunnally & Bernstein, 1994).

**Construct validity: Exploratory factor analysis**

Before conducting exploratory analyses, Bartlett’s test of sphericity was examined to test the null hypothesis that the original correlation matrix is an identity matrix. A significant result indicates that there are relationships between variables included in the analysis and not all correlation coefficients are equal to zero (Field, 2005). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was examined to predict whether the data were likely to factor well based on the correlation and partial correlation matrices. Higher KMO values reflect relatively compact correlation patterns, which indicate that factor analysis should appropriately yield distinct and reliable factors. KMO values between .5 and .7 are mediocre, values between .7 and .8 are good, values between .8 and .9 are great, and values greater than .9 are superb (see Field, 2005)

**Tests for mediation effects**

Correlational analyses were conducted to test whether the hypothesize negative relationships existed between social support, mastery, and self-esteem with depressive symptomatology. Bivariate correlations were conducted to assess whether the predicted relationships existed between social support, mastery, self-esteem, and depressive symptomatology. These correlations supported initial predictions, therefore MacKinnon’s (2008) and Baron and Kenny’s (1986) method for establishing mediation was used to ascertain whether
mastery and self-esteem mediated the relationship between social support and depressive symptomatology. Baron and Kenny’s (1986) test for mediating effects allows for one mediator, and as such, was adapted by MacKinnon (2008) to accommodate two mediators. Figure 1 details a generic model of the path for MacKinnon’s (2008) two-mediator model, while Figure 2 illustrates the model using the present study variables.

Figure 1

Figure 1. Path diagram for the two-mediator model (MacKinnon 2008)
A causal step method is recommended by MacKinnon (2008) to assess multiple mediating effects. MacKinnon has adapted the Baron and Kenny (1986) steps to establish mediation are as follows. Step 1: the independent variable (X) must affect the dependent variable (Y); Step 2: the independent variable (X) must affect the first mediator (M₁), and the independent variable (X) must affect the second mediator (M₂); Step 3: the mediator must affect the dependent variable (Y) when the independent variable (X) is controlled, Step 4: the direct effect must be nonsignificant. Mediation analyses were conducted for the MOS-SSS total score in addition to each dimension of social support (or subscale) revealed in exploratory factor analysis. Data was analyzed using PASW Statistics 18.0 software (SPSS Inc., 2007). Tests for single and
combined mediating effects were analyzed using the steps recommended by MacKinnon (2008).

See Appendix F
CHAPTER 3

Results

Objective 1: Internal Reliability and Construct Validity of the MOS-SSS

It was hypothesized that the MOS-SSS is a reliable and four-dimensional measure of functional social support among an HIV-infected population.

Reliability: Internal consistency

The internal reliability of the MOS-SSS was evaluated by obtaining the Cronbach’s alpha value for the overall scale. The initial hypothesis predicted that the scale would have good internal reliability with an HIV-infected population, as demonstrated by Sherbourne and Stewart (1991) with chronic health populations. With respect to MOS-SSS’s overall internal consistency, Cronbach’s alpha for the total scale was excellent (α = 0.96). To help explain which items do not consistently add to the reliability of MOS-SSS’s total score, the Cronbach’s alpha was examined to determine if individual items were deleted from the total scales. These analyses revealed that the alpha coefficient did not increase when items were deleted from the overall scale. Appendix G displays the inter-correlational matrix as well as the Cronbach’s alpha when items are deleted.

Construct validity: Exploratory factor analysis

My secondary hypothesis predicted that the MOS-SSS was a stable, four-dimensional measure of social support, corresponding to the four subscales, emotional/information support, tangible support, affectionate support, and positive social interaction, developed by Sherbourne and Stewart (1991). All 19 of the MOS-SSS’s items were used in the exploratory factor analysis through a principal-axis factor analysis. Before proceeding with principal-axis analysis, Bartlett’s (1954) test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1974) were examined. Bartlett’s test of sphericity was significant $\chi^2 (171) = 2811.60$ (p < .0001), which indicated that the factor matrix is adequate for analysis. The KMO yielded a
value of .928 indicating that the sample size was large enough to evaluate the factor structure. These results suggest that exploratory factor analysis was appropriate to analyze the data, and it was expected that the MOS-SSS’s items would yield common factors. Decisions regarding the number of factors to retain for the final scale were based on accepted principles of determining the number of factors which included examining the eigenvalues of each factor, variance accounted for by each factor, and the number of items loading on each factor (Clouse, 2007).

Examination of the scree-plot and the amount of variance accounted for by the items suggested the possibility of three factors. Figure 3 displays the scree-plot from the exploratory factor analysis. The eigenvalues for each of the factors were 11.61 (factor 1), 1.95 (factor 2), and 1.56 (factor 3), respectively. The amount of variance accounted for by each factor was 48.96% (factor 1), 5.19% (factor 2), and 3.25% (factor 3). The data was then reanalyzed with an oblique rotation. This rotation method was chosen because it was believed that the factors would be correlated due to the common underlying construct. The eigenvalues for each of the factors were 5.77 (factor 1), 5.60 (factor 2), and 3.74 (factor 3). The amount of variance accounted for by each factor was 30.37% (factor 1), 29.47% (factor 2), and 19.71% (factor 3). Table 4 displays the items loading on each factor. The items included in factor 1 of the analysis correspond with the first subscale described by Sherbourne and Stewart (1991), labelled “Emotional/Informational Support.” The items included in factor 3 of the analysis correspond with the second subscale, by Sherbourne and Stewart (1991), labelled “Tangible Support.” The items included in factor 2 of the analysis corresponds with the items included in the subscales labelled “Affectionate Support” and “Positive Social Interaction” (Sherbourne & Stewart; 1991), with the addition of item 19 which had not previously been included in Sherbourne and Stewart’s (1991) four dimensions of support.
Figure 3

Figure 3. Scree plot of eigenvalues’ magnitudes for the MOS Social Support Scale.
Table 2

*Factor loadings for the MOS Social Support Scale*

<table>
<thead>
<tr>
<th>Item #</th>
<th>Factor I</th>
<th>Factor II</th>
<th>Factor III</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.781</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.757</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.814</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.846</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.787</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.708</td>
<td>.419</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>0.751</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0.705</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>0.780</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>0.890</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>0.890</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>0.808</td>
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</tr>
<tr>
<td>13</td>
<td></td>
<td>0.763</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>0.786</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>0.844</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>0.821</td>
<td></td>
</tr>
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<td>17</td>
<td></td>
<td>0.817</td>
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</tr>
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<td>18</td>
<td></td>
<td>0.833</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>.427</td>
<td>0.754</td>
<td></td>
</tr>
</tbody>
</table>

*Note:* Item loadings above .40 are presented. Emotional/Informational Support items = 1, 2, 3, 4, 5, 6, 7, 8. Tangible Support items = 9, 10, 11, 12. Affectionate/Interpersonal items = 13, 14, 15, 16, 17, 18, 19.

**Identification of potential covariates**

The relationships of various demographic factors to the outcome measure were examined to identify potential covariates, including age, ethnicity, gender, country of birth, marital status, sexual orientation, education, income, and CD4 count (disease marker). Pearson product-moment correlations were conducted to examine relationships between continuous variables and the dependent variable, CES-D scores. Results of the analyses revealed the following significant
correlations: education \( (r = -0.261, p<0.05) \) and monthly personal income \( (r = -0.207, p<0.05) \) were negatively correlated with depressive symptoms, whereas age and CD4 count were not significantly correlated with depressive symptoms. Independent t-tests were run to investigate possible relationships between gender, ethnicity, marital status, and sexual orientation, with the outcome measure. No significant differences were found. Overall, correlations between age, education and depressive symptomatology were generally weak, therefore it can be concluded that demographic variables in the present study are not significant covariates and therefore do not need to be considered in further analyses.

Means and standard deviations for study variables were analyzed and reported in Table 2.

Table 3

<table>
<thead>
<tr>
<th>Variables</th>
<th>Time 1 (N=125)</th>
<th>Time 2 (n=88)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressive symptoms</td>
<td>24.8 (1.7)</td>
<td>24.3 (8.3)</td>
</tr>
<tr>
<td>Emotional/informational support</td>
<td>25.9 (8.3)</td>
<td></td>
</tr>
<tr>
<td>Tangible support</td>
<td>11.2 (5.5)</td>
<td></td>
</tr>
<tr>
<td>Affectionate/interpersonal</td>
<td>22.5 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Mastery</td>
<td>17.3 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>15.3 (2.5)</td>
<td></td>
</tr>
</tbody>
</table>

Objective 2: Examining the Relationships between Social Support and Depressive Symptomatology, as Mediated by Mastery and Self-Esteem

Correlational analyses were conducted to determine whether the predicted relationships existed between social support, mastery, self-esteem, and depression. The intercorrelations between each case variable, including each dimension of social support, are presented in Table 4.
Table 4

Intercorrelations between study variables

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Emotional/informational support</td>
<td>.603**</td>
<td>.680**</td>
<td>.380**</td>
<td>.240**</td>
<td>-.249*</td>
</tr>
<tr>
<td>2. Tangible support</td>
<td>.653**</td>
<td>.204*</td>
<td>.209*</td>
<td>-.272*</td>
<td></td>
</tr>
<tr>
<td>3. Affectionate/interpersonal support</td>
<td>.321**</td>
<td>.212*</td>
<td>-.214*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Mastery</td>
<td>.329**</td>
<td></td>
<td>-.459**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Self-esteem</td>
<td></td>
<td></td>
<td>-.215*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Depressive symptoms (Time 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p< .05
** p< .01

Exploration of the relations between emotional/informational support, tangible support, affectionate/interpersonal support, mastery, self-esteem and depressive symptomatology

Correlational analyses were conducted to test whether the hypothesize negative relationships existed between social support, mastery, and self-esteem with depressive symptomatology. Study variables were all correlated in the hypothesized directions. Results of the correlational analysis are displayed in Table 5

Test for mediation effects for each of the three dimension of the MOS-SSS

In addition to the bivariate correlations described above, a series of regression analyses were conducted to investigate the hypothesis that Mastery and Self-Esteem mediate the relationship between Social Support and Depressive Symptomatology. Analyses were performed using the three subscales of the MOS-SSS, Emotional/Informational Support, Tangible Support,
and Affectionate/Interpersonal Support. The total social support score was not used in analyses, as global social support was not determined to be a separate and unique factor from the three subscales. MacKinnon (2008) has adapted the Baron and Kenny (1986) steps to establish mediation are as follows. Step 1: the independent variable (emotional/information support, tangible support, affectionate/interpersonal support) must affect the dependent variable (depressive symptomatology); Step 2: the independent variable (emotional/information support, tangible support, affectionate/interpersonal support) must affect the first mediator (mastery), and the independent variable (emotional/information support, tangible support, affectionate/interpersonal support) must affect the second mediator (self-esteem); Step 3: the mediators must affect the dependent variable (depressive symptomatology) when the independent variable (emotional/information support, tangible support, affectionate/interpersonal support) is controlled, Step 4: the direct effect must be nonsignificant. Separate multiple regression analyses were used to test the first four steps, followed by MacKinnon’s (2008) significance tests for mediated effects.

It was hypothesized that both Mastery and Self-Esteem would together mediate the relation between the three dimensions of Social Support (Emotional/Information, Tangible, and Affectionate/Interpersonal support) and Depressive Symptomatology. Independent variables and mediators at time 1 were analyzed to predict the outcome at time 2. A combined mediating effect for Mastery and Self-Esteem was not supported. However, Mastery was found to have a significant mediating effect on the relationship between all dimensions of social support on depressive symptomatology. The following is a breakdown of the four steps to test mediating effects, followed by significance testing.

Emotional/Informational Support was associated with Depressive Symptomatology ($\beta = -0.265$, $t(111) = -2.387$, $p = .019$). Emotional/Informational support had a significant positive association on the first mediator, Mastery ($\beta = .163$, $t(.032) = 5.090$, $p < .001$), and also on the
second mediator, Self-Esteem ($\beta = .110$, $t(.033) = 3.299$, $p = .001$). Mastery had a significant negative effect on Depressive Symptomatology when Emotional/Informational Support was controlled ($\beta = -1.342$, $t(.357) = -3.764$, $p < .001$), however Self-Esteem did not ($\beta = -.182$, $t(.344) = -.530$, $p = .598$). The main effect of Emotional/Informational Support on Depressive Symptomatology was no longer significant once Mastery and Self-Esteem were added into the regression model ($\beta = -.027$, $t(.120) = -.223$, $p = .824$). McKinnon’s (2008) significance testing for overall combined mediating effects of Mastery and Self-Esteem revealed an overall effect of $- .238$, with upper and lower confidence limits of .062 and -.538, respectively, yielding a non-significant result. Significance testing was conducted to investigate the specific mediating effects of Mastery and Self-Esteem, separately. The specific mediating effect of Mastery on the relationship between Emotional/Informational Support and Depressive Symptomatology was $- .219$, with upper and lower confidence limits of -.077 and -.360, respectively. Since zero was not contained in the confidence interval this value yielded a significant mediating effect. The specific mediating effect of Self-Esteem, however, was not significant, $- .020$, with upper and lower confidence limits of .055 and -.095, respectively.

Tangible Support did significantly negatively affect the proposed outcome of Depressive Symptomatology ($\beta = - .425$, $t(.162) = - 2.620$, $p = .010$). Tangible Support had a significant positive association with Mastery ($\beta = .134$, $t(.052) = 2.594$, $p = .011$), as well as with Self-Esteem ($\beta = .116$, $t(.050) = 2.312$, $p = .023$). Mastery had a significant negative effect on Depressive Symptomatology when Tangible Support was controlled ($\beta = -1.273$, $t(.327) = -3.887$, $p < .001$), while Self-Esteem did not ($\beta = -.113$, $t(.337) = -.336$, $p = .738$). The main effect of Tangible Support on Depressive Symptomatology was no longer significant once Mastery and Self-Esteem were added into the regression model ($\beta = -.242$, $t(.157) = -1.538$, $p = .128$). McKinnon’s (2008) significance testing for overall combined mediating effects of Mastery and Self-Esteem revealed an overall effect of $- .183$, with upper and lower confidence limits of .103
and - .469, respectively, yielding a non-significant result. Significance testing was conducted to investigate the specific mediating effects of Mastery and Self-Esteem, separately. The specific mediating effect of mastery on the relationship between Tangible Support and Depressive Symptomatology was -.171, with upper and lower confidence limits of -.015 and -.326, respectively, yielding a significant mediating effect. The specific mediating effect of Self-Esteem, however, did not yield significant results, -.013, with upper and lower confidence limits of .064 and -.091, respectively.

Affectionate/Interpersonal Support did significantly negatively affect the proposed outcome of Depressive Symptomatology ($\beta = - .212, t(104) = - 2.030, p = .045$). Affectionate/Interpersonal Support had a significant positive association with the first mediator, Mastery ($\beta = .130, t(.031) = 4.204, p < .001$), as well as the second mediator, Self-Esteem ($\beta = .072, t(.032) = 2.264, p = .026$). Mastery had a significant negative effect on Depressive Symptomatology when Affectionate/Interpersonal Support was controlled ($\beta = - 1.348, t(.349) = - 3.865, p < .001$), however Self-Esteem did not ($\beta = - .190, t(.339) = -.560, p = .577$). The main effect of Affectionate/Interpersonal Support on Depressive Symptomatology was no longer significant once Mastery and Self-Esteem were added into the regression model ($\beta = - .023, t(.106) = -.216, p = .830$). McKinnon’s (2008) significance testing for overall combined mediating effects of Mastery and Self-Esteem revealed an overall effect of -.189, with upper and lower confidence limits of .035 and -.416, respectively, yielding a non-significant result. Significance testing was conducted to investigate the specific mediating effects of Mastery and Self-Esteem, separately. The specific mediating effect of Mastery on the relationship between Affectionate/Interpersonal Support and Depressive Symptomatology was -.175, with upper and lower confidence limits of -.054 and -.296, respectively, yielding a significant mediating effect. The specific mediating effect of Self-Esteem, however, did not yield significant results, -.014, with upper and lower
confidence limits of .036 and -.063, respectively. A summary of these findings is presented in Table 5. Figures 4.1, 4.2, and 4.3 displays the mediation model with corresponding effect sizes. Figure 5 displays the supported path diagram of the single-mediator model, using mastery.
Table 5

Summary of Mediating Effects of Mastery and Self-Esteem

<table>
<thead>
<tr>
<th>Mediated Relationship</th>
<th>Emotional/Informational Support &amp; Depressive Symptomatology</th>
<th>Tangible Support &amp; Depressive Symptomatology</th>
<th>Affectionate/Interpersonal Support &amp; Depressive Symptomatology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined Mediating Effect of Mastery and Self-Esteem</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Single Mediating Effect of Mastery</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Single Mediating Effect of Self-Esteem</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Figure 4.1

Figure 4.1. Mediating effects of mastery and self-esteem between emotional/informational support and depressive symptoms
Figure 4.2. Mediating effects of mastery and self-esteem between tangible support and depressive symptoms
Figure 4.3

Figure 4.3. Mediating effects of mastery and self-esteem between affectionate/interpersonal support and depressive symptoms
Figure 5

Figure 5. Supported path diagram for the single-mediator model with study variables

X₁: Emotional/Informational Support
X₂: Tangible Support
X₃: Affectionate/Interpersonal Support

Mastery M₁

Depressive Symptoms Y
CHAPTER 4

Discussion

The present study was conducted with several goals in mind, the primary of which was to investigate the relationship between social support and depressive symptomatology, as mediated by psychological resources (mastery and self-esteem), in people living with HIV/AIDS, as presented by Simoni et al. (2005). These analyses, as with the work completed by Simoni et al. (2005) are in line with the cognitive adaptation model by Taylor (1983), which suggested that individuals attempt to regain mastery and restore self-esteem in response to an illness or traumatic event. Further evaluating the relationships between social support, mastery, self-esteem and depression will help to guide interventions provided by health-care teams, AIDS Service Organizations, or individual therapists, targeted at improving the mental health of PHAs.

In addition, this study investigated the internal reliability of the Medical Outcomes Study Social Support Scale (MOS-SSS) developed by Sherbourne and Stewart (1991), and the presence of unique dimensions of functional social support, as measured by the MOS-SSS.

Direct Effects of Social Support and Psychological Resources

Consistent with previous research (Simoni et al., 2005; Mavandadi et al., 2009; Mills et al., 2004; Morris et al., 1991; Bisschop et al., 2004), three dimensions of social support, emotional/informational, tangible, and affectionate/interpersonal, were found to be correlated with reduced depressive symptomatology. This is consistent with the belief that social support enhances psychological well-being by meeting a person’s need for belonging and counteracting loneliness and depressive symptomatology (Bisschop et al., 2004). The consistent results across all three dimensions of social support suggests that the manner in which an individual feels supported is less important than the experience of feeling supported in general, in terms of its affect on depressive symptoms. Other studies have reported that different dimensions of social
support are frequently highly correlated with each other (Sherbourne & Stewart, 1991; Abramowitz et al., 2009; Shyu et al., 2006), which may have contributed to this effect.

These results compliment the findings of qualitative studies with PHAs by Longo, Spross, and Locke (1990) and Ciambrone (2001). Longo et al. (1990) interviewed 34 white, gay men with AIDS and found that social support served as a way to cope with feelings of uncertainty, isolation, fear, and vulnerability. Openness with support networks, such as family members, friends, health care providers, and coworkers, was reported to enable PHAs to address concerns about stigma, social isolation and rejection (Longo et al., 1990). Ciambrone (2001) interviewed 27 HIV-infected women who expressed a desire to receive support for other parts of their lives and identities that were not HIV-related. Areas identified included ways to improve social isolation, self-esteem, help with substance abuse, and help with violent relationships (Ciambrone, 2001). In order to reduce depression in PHAs and to provide the necessary support in this population, support interventions should focus on both the HIV-related and HIV-unrelated needs.

Mastery and self-esteem were also correlated with reduced depressive symptomatology. However, the relationship between mastery and depressive symptomatology was stronger than that with self-esteem, $r = -.459$ (p<.01) and $r = -.215$ (p<.05), respectively. This is consistent with numerous studies. (Thompson et al., 1993; Gray et al., 2002). As mentioned previously, an existing relationship between the mediators and the outcome measure was a necessary condition in order to proceed with mediation analyses. One possible reason for the stronger relationship between mastery and depressive symptomatology, over that between self-esteem and depressive symptomatology, is that average mastery scores for the study population were overall higher than scores for self-esteem. In fact, the average self-esteem score for the sample was very low, suggesting that individuals in the study sample overall had very negative evaluations of self-worth. Mean self-esteem item scores ranged from 1.65 (SD=.557) and 2.90 (SD=.896). Other
studies reported mean self-esteem item values as 3.14 (SD=.58; Schrimshaw, 2009) and 2.99 (SD=.50; Simoni et al., 2005). This may further be attributed to the fact that all study participants were unemployed at the time of baseline data collection. Since the primary study inclusion criteria specified that participants must have been unemployed for a period of at least six months, this is an expected result. It can be expected that unemployment status have had some negative effect on individuals’ self-worth, hence the reflection in overall lower self-esteem scores (Lyketsos et al., 1996). An alternative explanation is that self-esteem, as measured by the Rosenberg Self-Esteem Scale (1965) is not a unitary and global construct. The evidence in the literature is mixed, however a number of prominent theorists (Bandura, 1986; Marsh, 1990, Swann, 1990) have argued that specific self-views are better predictors of behaviour than global self-esteem (Dutton & Brown, 1997).

**Support for the Single-Mediator Model (MacKinnon, 2008) using Mastery**

The two-mediator model was not supported in the present study. Specifically, mastery and self-esteem (psychological resourcefulness) were not found to have a combined mediating effect on the association between dimensions of social support and depressive symptomatology. Results were consistent across all three dimensions of social support evaluated (emotional/informational, tangible, and affectionate/interpersonal). This finding contradicts the findings of Simoni et al. (1991) and Bovier et al. (2004) which found both mastery and self-esteem to be significant mediators between social support and reduced depression. In single mediation analyses, mastery was found to have a significant mediating effect. This result is in line with numerous studies (Pearlin et al., 1981; Bovier et al. 2004; Martire et al., 1998), including those focusing on HIV-infected individuals (Neff et al., 2003; Simoni & Cooperman, 2000). The results from the present study suggest that social support can bolster mastery, or peoples’ feelings of control over their lives, but that it is not able to strengthen one’s judgements about one’s self-worth.
Self-esteem was not found to have a significant effect between all three dimensions of social support in single mediation analyses. This is contrary to studies by Pearlin, Menaghan, Lieberman, & Mullan (1981), Symister & Friend (2003), Yang (2006), and Fakukwawa et al. (2000). For example, in a sample of Japanese women and men, Fakukwawa et al. (2000) found that social support had no significant direct relation to depressed affect. However, the study further demonstrated that social support had an indirect effect on depressed affect, only when mediated by self-esteem. One explanation of the contradiction in these findings is the remarkably low self-esteem reported in this sample. As previously mentioned, the low self-esteem appraisals could be attributed to participants’ unemployment status at the time psychological resources were assessed. Alternatively, self-esteem, as measured by the Rosenberg Self-Esteem Scale (1965) may not represent a unitary construct. Finally, another possible explanation for the lack of support for mediating effects of self-esteem is that analyses did not have enough power to produce significant results, as other studies were successful in doing so (Bovier et al., 2004, Simoni et al., 2005). While Bovier et al. (2004) did report a stronger mediating effect of mastery over self-esteem, contrary to the present study, the mediating effects of both mastery and self-esteem were still significant.

**Support for the Cognitive Adaptation Model (Taylor, 1983)**

Taylor’s (1983) model of cognitive adaptation was only partially supported in the present study. Specifically, the significant mediating effect of mastery on the relationship between dimensions of social support and depressive symptoms is consistent with Taylor’s (1983) cognitive adaptation model, which proposed that mastery and control over one’s illness or stressful life event is instrumental in adapting to the illness itself (Simoni et al., 2005). Taylor’s (1983) model was applied to investigate whether individuals living with HIV/AIDS would display an attempt to regain mastery and restore self-esteem in response to their HIV-infection. The latter component of the Taylor’s theory (1983) was not supported in analyses. Taylor’s
model was based on research with women diagnosed with breast cancer, including those with good prognosis and others without. Simoni et al. (2005) similarly evaluated the model within a sample of HIV-infected women. One possible explanation as to why the cognitive adaptation model was not fully supported in the present study is owing to the fact that the sample was predominantly male. A model presented by Cambron, Acitelli, and Pettit (2008) suggests that self-esteem and depression are more strongly related in women than men owing to the increased likelihood that women will base their self-worth on the quality of their interpersonal relationships. This may explain why social support was demonstrated to bolster self-esteem and reduce depression in study samples with women (Simoni et al., 2005; Taylor, 1983), as opposed to the present study.

The lack of support for the effects of self-esteem in the cognitive adaptation model (Taylor, 1983) could have been further impacted by the unemployment status of the sample at the time self-esteem was assessed. As mentioned previously, unemployment is known to have detrimental effects on self-esteem in PHAs (Lyketsos et al., 1996). A meta-analyses of unemployment and mental health (Paul & Moser, 2009) reported that unemployment had a more detrimental effect on self-esteem in men, compared to women. Two-hundred and thirty-seven cross-sectional and 87 longitudinal studies were reviewed (Paul & Moser, 2009). This is supported in research by Waters and Moore (2002), in which unemployment had a stronger negative effect on self-esteem in men and social support was found to have a stronger positive effect on self-esteem in unemployed women.

Reliability and Validity of the MOS-SSS

The reliability and validity of the MOS-SSS (Sherbourne & Stewart, 1991) was assessed prior to mediation analyses. The MOS-SSS was developed out of the Medical Outcomes Study, a two-year longitudinal study assessing process and outcomes of care for patients with chronic conditions. This measure was selected over other measures of social support owing to its focus
on a chronic disease population. The scale is focused on perceived availability of support and was developed to measure global social support (total score) as well as four dimensions of support, including, emotional-informational, affectionate, tangible, and positive social interaction (Sherbourne & Stewart, 1991). The present study found the MOS-SSS to have good internal consistency, consistent with the measure’s authors (Sherbourne & Stewart, 1991). Two other studies have investigated the reliability and validity of the MOS-SSS. Yu, Lee, and Woo (2004) tested the Chinese version of the MOS-SSS and Shyu, Tang, Liang, and Weng (2006) tested the Taiwanese version of the MOS-SSS. Both studies reported similar reliability with the translated scales. Abramowitz et al. (2009) conducted similar analyses with HIV-infected youth in the United States (ages 13-21) and also found good reliability.

Results from exploratory factor analysis of the MOS-SSS revealed a different internal factor structure than reported by Sherbourne and Stewart (1991). Contrary to the five-factor model presented by the measure’s developers (global social support, emotional/information support, affectionate support, tangible support, positive social interaction), the present analyses yielded a three factor solution. The original subscale labelled emotional/information support, was retained in the present study’s model, as well as the tangible support subscale. However, the remaining two subscales, affectionate support and positive social interaction, were combined as one factor, renamed affectionate/interpersonal support. In previous research, factor analysis of the MOS-SSS with a Taiwanese sample yielded a two-factor model, which was specified as emotional support and tangible support (Shyu et al., 2006). Similar analyses with HIV-infected youth in the United States reported the same two-factor model of emotional and tangible support. Other measures of social support, for example the Perceived Social Support Scale (PSSS; Krause & Markides, 1990), report a three-factor model. The PSSS includes three subscales that measure tangible support, informational support, and emotional support (Krause & Markides, 1990). The
dimensions of social support reported by these authors appear to be similar to those found in the present study with the MOS-SSS.

**Concluding Remarks**

The present study demonstrates that each dimension of social support (emotional/informational, tangible, and affectionate/interpersonal), mastery, and self-esteem can contribute to the reduction of depressive symptoms. Mastery was demonstrated to have a mediating effect on the relationship between all dimensions of social support and depression. This suggests that social support is able to bolster feelings of mastery, which in turn reduces depressive symptomatology, in a predominantly male HIV-infected population. Contrary to predictions and research by Simoni et al. (2005), the combined effect of psychological resources, mastery and self-esteem, were not found to be significant mediators of social support and depression. In addition, self-esteem was not found to have mediating effects. As such, Taylor’s (1983) cognitive adaptation model was only partially supported. These results may be explained by the gender differences between the present study sample, predominantly male, and the female samples investigated by Taylor (1983) and Simoni et al. (2005). Additionally, study participants were all unemployed at the time psychological resources were evaluated, further contributing to lower self-esteem scores and non-significant mediating effects on the relationship between dimensions of social support and depression.

Further, factor analysis of the MOS-SSS demonstrated that a three factor solution is the best fit to the data, contrary to the five factor solution proposed by the measure’s authors. Global social support was not found to be a significant in the factor structure, however, two of the four subscales, emotional/informational support and tangible support, were supported by the obtained factor structure, followed by a third factor combining the remaining items from the previous two subscales of affectionate support and positive social interaction.
**Strengths and limitations of the present study**

Several limitations of the current study must be acknowledged. While the study sample size was reasonably large (N=125), it was reduced in analyses (n=88) when investigating the predictive nature of social support, mastery and self-esteem on depressive symptoms at time 2 (3-month follow up). This may have limited overall statistical power to detect the associations examined. Additionally, the Baron and Kenny (1986) and MacKinnon (2008) models for mediation analyses are prone to calculation and rounding errors and are fraught with other limitations (MacKinnon, 2008). Future research should employ structural equation modeling techniques to evaluate the pathways in mediation models. As part of the primary study’s inclusion criteria, all study participants were unemployed at baseline. As such, the study results may not be representative of the majority of HIV-infected gay men living in Toronto. There was also not enough adequate data collected on disease markers of HIV/AIDS and symptom burden, which made it difficult to assess the effects these important variables on depression.

The present study is thought to provide a valuable contribution to the existing body of research in resilience in HIV/AIDS by investigating the positive effects of external resources (social support) and psychological resources (mastery and self-esteem) on reducing depression. This study provides partial evidence of Taylor’s (1983) cognitive adaptation model and builds on the work of Simoni et al. (2005) by investigating this model within a predominantly gay male population, extending the results from the original sample. It further acknowledges differences in the effects of self-esteem on depression, in relation to social support in men versus women, as well as differences self-esteem in an unemployed population of men versus women. Results were consistent across three dimensions of social support, emotional/informational, tangible, and affectionate/interpersonal, suggesting that individual perception of being supported is more important than the type of support being received. The study conducted additional investigation
into the reliability and validity of the MOS-SSS within an HIV-infected population. This is the first time the measure has been validated with this particular chronic illness.

**Areas for future research and practical implications**

Despite aforementioned limitations, the present findings have some relevance for clinical practice. As cited in numerous studies, individuals with HIV/AIDS need to be screened and treated for depression as soon as it is detected (Simoni et al., 2005, Lyketsos et al., 1993, Ickovics et al., 2001; Rabkin, 2008). These individuals should also be assessed for access to social support as well as monitored for mastery and self-esteem. The study suggests that interventions should not target social support alone, but also individuals’ sense of mastery or personal control over their life and health. Interventions should not only aim to provide supportive relationships, but also strengthen individuals’ sense of control over their illness, through these supportive relationships (Schrimshaw, 2009). Additional attention should be paid to the employment status and gender of PHAs seeking support and care, as social support may bolster self-esteem in women but not in men. Additionally, efforts to strengthen social bonds and networks for people living with HIV/AIDS could be beneficial, as these networks often decline over time (Burgoyne & Renwick, 2004).

Future research is needed to investigate the causal effects of social support on psychological resources. Research should evaluate the specific effects of gender and employment status on these relationships. Longitudinal analyses should employ more sophisticated and powerful methods than regression analyses, such as structural equation modeling, to further investigate the pathways between social support, psychological resources, and depression. Further evaluating the relationships between social support, mastery, self-esteem and depression will help to guide interventions provided by health-care teams, AIDS Service Organizations, or individual therapists, targeted at improving the mental health of PHAs.
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Appendix A

Generic Study Information Sheet

(Printed on St. Michael’s Hospital letterhead)

GENERAL INFORMATION FOR POTENTIAL PARTICIPANTS

Research Study: Effects of Returning to Work on Quality of Life in HIV/AIDS

Purpose of the Research: The main objective of this study is to examine the impact of return to work on health in people living with HIV/AIDS. The secondary objective is to understand the factors that influence return to work in people living with HIV/AIDS who are interested in going back to work.

Inclusion/Exclusion Criteria: You are eligible to participate in this study if you have HIV infection or AIDS, you have been unemployed for more than 3 months, and you are interested in going back to work. If you are currently volunteering or working “under the table”, and you are considering returning to paid employment, you still qualify to participate. Only those who have been working for income that is taxable for the past 3 months will not be invited to participate.

Description of the Research: Study participants will be people living with HIV/AIDS who have been unemployed for more than 3 months and who are interested in going back to work. A total of 145 participants will be recruited for this study.

If you choose to participate in this study, you will be asked to complete a questionnaire regarding your employment history, educational background, job-seeking activities, income sources, health status, mood, and quality of life. These questionnaires will be completed with the Research Coordinator of the study at St. Michael’s Hospital every 3 months over a 2-year period, for a total of 9 sessions.

Six of the sessions will be approximately 45 minutes to 1 hour in length. Three of the sessions (those conducted at baseline, 1 year, and 2 years) will be 1 hour or 1.5 hours in length.

Participation in this study is for research purposes only and will not have any effect on the services and/or the medical care you receive at St. Michael’s Hospital (if any). Your identity will be kept confidential.

Reimbursement: You will receive $25 at each visit for all 9 visits to cover expenses (a total of $225 if you complete all visits). These expenses may include parking costs, transit fares, taxi fares, or lost wages as a result of participation. If you decide for any reason to stop your participation in this study, you will still be reimbursed for costs incurred before your withdrawal.

Contact person: If you are interested in participating or would like more information, please contact Jennifer, the Research Coordinator at St. Michael’s Hospital at 416-864-6060 ext. 6287.
HEALTHY ADULTS NEEDED FOR A RESEARCH STUDY

Are you interested in participating in a behavioural research study?

The Neurobehavioural Research Unit at St. Michael’s Hospital is recruiting healthy adults who are HIV-negative for a research study to help understand how HIV-infection might cause changes in cognitive skills (e.g., concentration and memory).

All eligible participants will be paid an honorarium for each in-person session. For more information on our studies, call the study coordinator at:

   416-864-6060 x6424

   Participation is Confidential
Are you an adult with HIV-infection who is currently NOT WORKING and interested in GOING BACK TO WORK?

You may be eligible to participate in a study to help us understand whether returning to work improves health-related quality of life in people living with HIV/AIDS.

Participation is anonymous, and your identity will remain completely confidential.

For more information please phone: 416-864-6060
Ext. 6287 (Jennifer)

You will be paid an honorarium for your participation.
1. **What is your gender?**
   - Female
   - Male

2. **What is your age?**
   - years old

3. **To which ethnic or cultural group(s) do you belong?**
   

4. **What is your native language?**
   - English
   - French
   - Other (please specify): ______________

5. **In what country were you born?**
   - Canada → skip to question 7
   - Other (please specify): ______________

6. **In what year did you first come to Canada to live?**

7. **What is your marital status?**
   - Married
   - Widowed
   - Common-law
   - Separated
   - Living with a partner
   - Divorced
   - Single (never married)

8. **What is your sexual orientation?**
   - Heterosexual
   - Gay/Lesbian
   - Transgendered and/or Transsexual
   - Bisexual
9. **Are you currently attending a school, college or university?**
   - □ Yes
   - □ No → skip to question #12

10. **Are you enrolled as a full-time student or a part-time student?**  □ Full-time  □ Part-time

11. **When did you first enroll in this program of study?** (mm/yy) □ □/□

12. **How many years of school have you completed?** Please circle the number of years completed at each level (Primary, Secondary, and Post-secondary)

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<tr>
<td>Post-secondary</td>
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13. **What is the highest level of education that you have ever attained?** (check all that apply)
   - □ Some primary school
   - □ Primary school
   - □ Some high school
   - □ High school diploma
   - □ Some trade, technical or vocational school, business college, community college, CEGEP, nursing school, or university
   - □ Diploma or certificate from trade, technical or vocational school, business college, community college, CEGEP or nursing school
   - □ Bachelor’s or undergraduate degree, or teacher’s college
   - □ Degree in medicine, dentistry, veterinary medicine or optometry
   - □ Master’s degree
   - □ Doctoral degree
   - □ Other (please specify)___________________
14. Have you ever worked for pay in Canada?  □ Yes  □ No

15. When was the last time you worked for pay?  (mm/yy) □ □/□ □
   (not including underground or “under the table” work)

16. Why did you stop working for pay? (check all that apply)
   □ HIV-related illness or disability  □ Temporary layoff not due to seasonal conditions
   □ Other disease-related disability  □ Permanent layoff
   □ Personal or family responsibilities  □ Retired
   □ Caring for children, elder relatives, partner or spouse  □ Unpaid or partially paid leave
   □ Pregnancy  □ Looking for work
   □ School or educational leave  □ Disabled/recovering for illness
   □ Labour dispute  □ Resigned
   □ Temporary layoff due to seasonal conditions  □ Other
   □ Retired  (specify):______________________

17. What was your previous (last) occupation?
   □ Management occupations
   □ Business, finance and administrative occupations
   □ Natural and applied sciences and related occupations
   □ Health occupations
   □ Occupations in social science, education, government service and religion
   □ Occupations in art, culture, recreation and sport
   □ Sales and service occupations
   □ Trades, transport and equipment operators and related occupations
   □ Occupations unique to primary industry
   □ Occupations unique to processing, manufacturing and utilities
   □ Other

18. Are you currently volunteering (working without pay)?
   □ Yes  □ No
19. **If you are currently working for pay or volunteering, please complete the chart below.**
Please include underground or “under the table” work. (Please be as specific as possible using the attached calendar)

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<thead>
<tr>
<th>Type of work</th>
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<th>Average hours per week</th>
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20. **If you have a partner or spouse, is he or she currently working for pay?**
☐ Yes  ☐ No  ☐ I do not have a partner or spouse
21. **In the last 12 months, did you receive income from any of these sources?**

- **Pension / Insurance**
  - (Employment Insurance, Worker’s compensation)
  - ☐ Yes ☐ No

- **Long Term Disability (LTD)**
  - ☐ Yes ☐ No

- **Ontario Disability Support Program (ODSP)**
  - ☐ Yes ☐ No

- **Ontario Works (General Welfare Assistance)**
  - ☐ Yes ☐ No

- **Disability Income (Canada Pension Plan)**
  - ☐ Yes ☐ No

- **Employment Earnings**
  - ☐ Yes ☐ No

- **Contributions from family (including partner/Spouse)**
  - for living expenses (e.g., rent, food, utilities, allowance)
  - ☐ Yes ☐ No

- **Other income, not Earnings of Benefits**
  - (e.g., alimony, child support, trust fund, inheritances).
  - ☐ Yes ☐ No

Please specify: __________________________

22. **What is your best estimate of your total personal income, before taxes and deductions, from all sources in the past month:** $☐☐☐,☐☐☐

23. **How much of your monthly total personal income comes from employment?** $☐☐☐,☐☐☐

24. **How many people live in your household (including yourself, but not including roommates)?** ☐☐

25. **What is your best estimate of the total household income, before taxes and deductions, of all household members from all sources in the past month (not including roommates)?** $☐☐☐,☐☐☐

26. **When did you start receiving disability payments?** (mm/yy) ☐☐/☐☐

27. **Are you currently participating in any Drug Plan?** ☐ Yes ☐ No
28. In what year did you first test positive for HIV? □ □ □ □ □ □ Don’t know

29. In what year do you think you were infected? □ □ □ □ □ □ Don’t know

30. How many times have you been hospitalized in the past 3 months? □ □ □

31. What was your most recent CD4 count: □ □ □ □ □ cells/mm³ □ Don’t know

32. What was your highest ever CD4 count: □ □ □ □ □ cells/mm³ □ Don’t know

33. What was your most recent viral load: □ □ □ □ □ copies/mL □ Don’t know
□ Undetectable

34. What was your lowest ever viral load: □ □ □ □ □ copies/mL □ Don’t know
□ Undetectable

35. Please check the medication(s) you are currently taking: □ None

□□ Number of HIV meds

□ Abacavir (Ziagen)
□ Adefovir (Preveon)
□ Amprenavir (Agenerase)
□ Atazanavir (Zrivada)
□ Delavirdine (Rescriptor)
□ Didanosine (ddI) (Videx)
□ Didanosine EC (Videx EC)
□ Efavirenz (Sustiva)
□ Enfuvirtide (T-20) (Fuzeon)
□ Indinavir (Crixivan)
□ Lamivudine (3TC) (3TC, Heptovir)
□ Lamivudine + Abacavir (Not yet marketed)
□ Lopinavir / ritonavir (Kaletra)
□ Nelfinavir (Viracept)
□ Nevirapine (Viramune)
□ Ritonavir (Norvir SEC, Norvir)
□ Saquinavir (Invirase, Fortovase)
□ Stavudine (d4T) (Zerit, Zerit XR)
□ Tenofovir (Viread)
□ Tipranavir (Not yet marketed)
□ Zalcitabine (ddC) (Hivid)
□ Zidovudine (AZT) (Retrovir)
□ Zidovudine + Lamivudine (Combivir)
□ Zidovudine + Lamivudine + Abacavir (Trizivir)
□ Other: ____________________
36. **Overall, is your health better or worse than you expected it to be at this point?**
   - [ ] Much better
   - [ ] Somewhat better
   - [ ] As expected
   - [ ] Somewhat worse
   - [ ] Much worse

37. **Do you think you will recover enough to return to your usual job?**
   - [ ] Yes
   - [ ] No
   - [ ] Don’t know

38. **Taking into account what you know about your illness, do you think that it will:**
   - [ ] Get better soon
   - [ ] Get better slowly
   - [ ] Don’t know future course
   - [ ] Never get better
   - [ ] Get worse

39. **How long do you think it will take for you to return to your usual activities?**
   - [ ] Days
   - [ ] Weeks
   - [ ] Already returned to usual activities
   - [ ] Months
   - [ ] Years
   - [ ] Never
Please read the following statements describing concerns you may have about returning to work. Please tell me how much you agree or disagree with each statement by circling only one response.

1. **I am concerned that I will lose my disability income benefits if I go to work.**
   - ![Strongly disagree]
   - ![Disagree]
   - ![Neutral or undecided]
   - ![Agree]
   - ![Strongly agree]

2. **I am concerned that I will lose my health benefits if I go to work.**
   - ![Strongly disagree]
   - ![Disagree]
   - ![Neutral or undecided]
   - ![Agree]
   - ![Strongly agree]

3. **I am concerned that I might not be able to get adequate health benefits if I go to work.**
   - ![Strongly disagree]
   - ![Disagree]
   - ![Neutral or undecided]
   - ![Agree]
   - ![Strongly agree]

4. **I am concerned that my health will get worse if I go to work.**
   - ![Strongly disagree]
   - ![Disagree]
   - ![Neutral or undecided]
   - ![Agree]
   - ![Strongly agree]
5. I am concerned that I will not be able to keep up with the physical job demands if I go to work.
   □ Strongly disagree
   □ Disagree
   □ Neutral or undecided
   □ Agree
   □ Strongly agree

6. I am concerned that I am too disabled physically to go to work.
   □ Strongly disagree
   □ Disagree
   □ Neutral or undecided
   □ Agree
   □ Strongly agree

7. I am concerned that I don't have enough education to get the kind of job I would like.
   □ Strongly disagree
   □ Disagree
   □ Neutral or undecided
   □ Agree
   □ Strongly agree

8. I am concerned that I don't have the right skills to get the kind of job I would like.
   □ Strongly disagree
   □ Disagree
   □ Neutral or undecided
   □ Agree
   □ Strongly agree

9. I am concerned that my coworkers will find out I have HIV if I go to work.
   □ Strongly disagree
   □ Disagree
   □ Neutral or undecided
   □ Agree
   □ Strongly agree
10. **I am concerned that I will be discriminated against because of HIV if I go to work.**
   - [ ] Strongly disagree
   - [ ] Disagree
   - [ ] Neutral or undecided
   - [ ] Agree
   - [ ] Strongly agree

11. **I am concerned that I will not be able to take my medications as prescribed if I go to work.**
   - [ ] Strongly disagree
   - [ ] Disagree
   - [ ] Neutral or undecided
   - [ ] Agree
   - [ ] Strongly agree

12. **I am concerned that I will not be able to take time off for my medical appointments if I go to work.**
   - [ ] Strongly disagree
   - [ ] Disagree
   - [ ] Neutral or undecided
   - [ ] Agree
   - [ ] Strongly agree

13. **I am concerned that I might be exposed to new diseases if I go to work.**
   - [ ] Strongly disagree
   - [ ] Disagree
   - [ ] Neutral or undecided
   - [ ] Agree
   - [ ] Strongly agree

14. **I am concerned that I will have to make too many changes in my daily routine if I go to work.**
   - [ ] Strongly disagree
   - [ ] Disagree
   - [ ] Neutral or undecided
   - [ ] Agree
   - [ ] Strongly agree
15. I am concerned that I will not have enough rest periods if I go to work.

☐ Strongly disagree
☐ Disagree
☐ Neutral or undecided
☐ Agree
☐ Strongly agree
MOS-HIV Health Survey

Please answer the following questions by placing a “X” in the appropriate box.

1. In general would you say your health is: (Check one)
   - Excellent……………………….. 1
   - Very good……………………… 2
   - Good………………………….... 3
   - Fair………………..……….…… 4
   - Poor……………………………. 5

2. How much bodily pain have you generally had during the past 4 weeks? (Check one)
   - None…………………………..... 1
   - Very mild………………………. 2
   - Mild…………………………... 3
   - Moderate…………………….. 4
   - Severe…………………………... 5
   - Very severe…………………….. 6

2. During the past 4 weeks, how much did pain interfere with your normal work (or your normal activities, including work outside the home and housework)? (Check one)
   - Not at all………………………... 1
   - A little bit………………………. 2
   - Moderately…………………….. 3
   - Quite a bit……………………... 4
   - Extremely………………………… 5
**MOS-HIV Health Survey cont’d**

4. The following questions are about activities you might do during a typical day. Does your **health now limit you** in these activities? If so how much?

   (Check one box on each line.)

<table>
<thead>
<tr>
<th></th>
<th>YES, Limited a lot (1)</th>
<th>YES, Limited a little (2)</th>
<th>NO, Not limited (3)</th>
</tr>
</thead>
</table>
   a. The kinds or amounts of vigorous activities you can do like lifting heavy objects, running or participating in strenuous sports. | | | |
   b. The kinds of moderate activities you can do like moving a table, carrying groceries or bowling. | | | |
   c. Walking uphill or climbing (a few flights of stairs). | | | |
   d. Bending, lifting or stooping. | | | |
   e. Walking one block. | | | |
   f. Eating, dressing, bathing or using the toilet. | | | |

5. Does your **health** keep you from working at a job, doing work around the house or going to school?

   Yes 1
   No 2

6. Have you been unable to do **certain kinds or amounts** of work, housework or schoolwork because of your health?

   Yes 1
   No 2

For each of the following questions please check the box for the one answer that comes closest to the way you have been feeling during the past four weeks.
7. How much of the time during the past four weeks, has your health limited your social activities (like visiting friends or close relatives)?

<table>
<thead>
<tr>
<th>All of the time</th>
<th>Most of the time</th>
<th>A good bit of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. How much of the time during the past 4 weeks:

a. Have you been a very nervous person?

<table>
<thead>
<tr>
<th>All of the time</th>
<th>Most of the time</th>
<th>A good bit of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. Have you felt calm and peaceful?

<table>
<thead>
<tr>
<th>All of the time</th>
<th>Most of the time</th>
<th>A good bit of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

c. Have you felt downhearted and blue?

<table>
<thead>
<tr>
<th>All of the time</th>
<th>Most of the time</th>
<th>A good bit of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

d. Have you been a happy person?

<table>
<thead>
<tr>
<th>All of the time</th>
<th>Most of the time</th>
<th>A good bit of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

e. Have you felt so down in the dumps that nothing could cheer you up?

<table>
<thead>
<tr>
<th>All of the time</th>
<th>Most of the time</th>
<th>A good bit of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MOS-HIV Health Survey cont’d

For each of the following questions, please check the box for the one answer that comes closest to the way you have been feeling during the past four weeks.

<table>
<thead>
<tr>
<th></th>
<th>All of the time (1)</th>
<th>Most of the time (2)</th>
<th>A good bit of the time (3)</th>
<th>Some of the time (4)</th>
<th>A little of the time (5)</th>
<th>None of the time (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. How often during the past four weeks:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Did you feel full of pep?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Did you feel worn out?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Did you feel tired?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Did you have enough energy to do the things you wanted to?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Did you feel weighed down by your health problems?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Were you discouraged by your health problems?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Did you feel despair over your health problems?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Were you afraid because of your health?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10. How much of the time during the past 4 weeks:

<table>
<thead>
<tr>
<th>All of the time</th>
<th>Most of the time</th>
<th>A good bit of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

a. Did you have difficulty reasoning and solving problems, for example making plans, making decisions, learning new things?  

b. Did you forget things that happened recently, for example, where you put things and when you had appointments?  

c. Did you have trouble keeping your attention on any activity for long?  

d. Did you have difficulty doing activities involving concentration and thinking?  

11. Please check the box that best describes whether each of the following statements is true or false for you. (check one box on each line)  

<table>
<thead>
<tr>
<th>Definitely true 1</th>
<th>Mostly true 2</th>
<th>Not sure 3</th>
<th>Mostly false 4</th>
<th>Definitely false 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I am somewhat ill</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. I am as healthy as anybody I know</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. My health is excellent.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. I have been feeling bad lately.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MOS-HIV Health Survey cont’d

12. How has the quality of your life been during the past 4 weeks? That is, how have things going for you?

   Very well: could hardly be better 1
   Pretty good 2
   Good and bad parts about equal 3
   Pretty bad 4
   Very bad: could hardly be worse 5

13. How would you rate your physical health and emotional condition now compared to 4 months ago?

   Much better 1
   A little better 2
   About the same 3
   A little worse 4
   Much worse 5
**CES-D Scale**

Below is a list of the ways you might have felt or behaved. Please indicate how often you have felt this way **DURING THE PAST WEEK.**

- 0 = Rarely or None of the Time (Less than 1 Day)
- 1 = Some or a Little of the Time (1 - 2 Days)
- 2 = Occasionally or a Moderate Amount of Time (3 - 4 Days)
- 3 = Most or All of the Time (5 - 7 Days)

<table>
<thead>
<tr>
<th>DURING THE PAST WEEK:</th>
<th>Rarely/ None</th>
<th>Some/ A Little</th>
<th>Occasionally/ Moderately</th>
<th>Most/ All</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I was bothered by things that usually don’t bother me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. I did not feel like eating; my appetite was poor.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. I felt that I could not shake off the blues even with help from my family or friends.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. I felt that I was just as good as other people.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. I had trouble keeping my mind on what I was doing.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. I felt depressed.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. I felt that everything I did was an effort.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. I felt hopeful about the future.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. I thought my life had been a failure.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10. I felt fearful.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11. My sleep was restless.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12. I was happy.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
**CES-D Scale cont’d**

0 = Rarely or None of the Time (Less than 1 Day)
1 = Some or a Little of the Time (1 - 2 Days)
2 = Occasionally or a Moderate Amount of Time (3 - 4 Days)
3 = Most or All of the Time (5 - 7 Days)

<table>
<thead>
<tr>
<th>DURING THE PAST WEEK:</th>
<th>Rarely/None</th>
<th>Some/A little</th>
<th>Occasionally/Moderately</th>
<th>Most/All</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. I talked less than usual.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14. I felt lonely.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15. People were unfriendly.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16. I enjoyed life.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17. I had crying spells.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>18. I felt sad.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>19. I felt that people dislike me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20. I could not get &quot;going.&quot;</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
People sometimes look to others for companionship, assistance, or other types of support. How often are each of the following kinds of support available to you if you need it? **Circle ONE number on each line.**

<table>
<thead>
<tr>
<th>Emotional/informational support</th>
<th>None of the time</th>
<th>A little of the time</th>
<th>Some of the time</th>
<th>Most of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Someone you can count on to listen to you when you need to talk</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to give you information to help you understand a situation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to give you good advice about a crisis</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to confide in or talk to about yourself or your problems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone whose advice you really want</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to share your most private worries and fears with</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to turn to for suggestions about how to deal with a personal problem</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone who understands your problems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tangible support</th>
<th>None of the time</th>
<th>A little of the time</th>
<th>Some of the time</th>
<th>Most of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Someone to help you if you were confined to bed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to take you to the doctor if you needed it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to prepare your meals if you were unable to do it yourself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to help with daily chores if you were sick</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Affectionate support</th>
<th>None of the time</th>
<th>A little of the time</th>
<th>Some of the time</th>
<th>Most of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Someone who shows you love and affection</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to love you and make you feel wanted</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone who hugs you</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Positive social interaction</th>
<th>None of the time</th>
<th>A little of the time</th>
<th>Some of the time</th>
<th>Most of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Someone to have a good time with</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to get together with for relaxation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to do something enjoyable with</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Additional item:** Someone to do things with to help you get your mind off things

1 | 2 | 3 | 4 | 5
# Pearlin Mastery Scale

Please put a check (✓) in the box that indicates your level of agreement with the following statements:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>There is really no way I can solve some of the problems I have</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Sometimes I feel that I’m pushed around in life.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>I have little control over the things that happen to me.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>I can do just about anything I really set my mind to.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>I often feel helpless in dealing with the problems of life.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>What happens to me in the future mostly depends on me.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>There is little I can do to change many of the important things in my life.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Rosenberg Self-Esteem Scale

Below is a list of statements dealing with your general feelings about yourself. Please put a check (✓) in the box that indicates your level of agreement with the following statements:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

1. On the whole, I am satisfied with myself.

2. At times I think I am no good at all.

3. I feel that I have a number of good qualities.

4. I am able to do things as well as most other people.

5. I feel I do not have much to be proud of.

6. I certainly feel useless at times.

7. I feel that I am a person of worth, at least on an equal plane with others.

8. I wish I could have more respect for myself.

9. All in all, I am inclined to feel that I am a failure.

10. I take a positive attitude toward myself.
Rosenberg Self-Esteem Scale

The following items ask about how much control you have over different aspects of your life (to what extent are you able to get the good things or avoid the bad things in this domain of life experience). **PLEASE CIRCLE THE ONE NUMBER THAT BEST DESCRIBES YOUR CURRENT LIFE SITUATION.** If an item is not applicable, please circle the number one (1) to indicate that this aspect of your life is not affected very much. Please do not leave any item unanswered. Thank you.

**How much control do you have over your:**

1. **HEALTH**
   
   Not Very Much  1  2  3  4  5  6  7  Very Much

2. **DIET** (i.e., the things you eat and drink)
   
   Not Very Much  1  2  3  4  5  6  7  Very Much

3. **WORK**
   
   Not Very Much  1  2  3  4  5  6  7  Very Much

4. **ACTIVE RECREATION** (e.g., sports)
   
   Not Very Much  1  2  3  4  5  6  7  Very Much

5. **PASSIVE RECREATION** (e.g., reading, listening to music)
   
   Not Very Much  1  2  3  4  5  6  7  Very Much

6. **FINANCIAL SITUATION**
   
   Not Very Much  1  2  3  4  5  6  7  Very Much

7. **RELATIONSHIP WITH YOUR PARTNER / SPOUSE** (boyfriend or girlfriend if not married)
   
   Not Very Much  1  2  3  4  5  6  7  Very Much
Rosenberg Self-Esteem Scale

How much control do you have over your:

8. **SEX LIFE**

   *Not Very Much* 1 2 3 4 5 6 7 *Very Much*

9. **FAMILY RELATIONS**

   *Not Very Much* 1 2 3 4 5 6 7 *Very Much*

10. **OTHER SOCIAL RELATIONS**

    *Not Very Much* 1 2 3 4 5 6 7 *Very Much*

11. **SELF-EXPRESSION/SELF-IMPROVEMENT**

    *Not Very Much* 1 2 3 4 5 6 7 *Very Much*

12. **RELIGIOUS EXPRESSION**

    *Not Very Much* 1 2 3 4 5 6 7 *Very Much*

13. **COMMUNITY AND CIVIC INVOLVEMENT**

    *Not Very Much* 1 2 3 4 5 6 7 *Very Much*
Appendix E

Participant Consent Form

(Printed on St. Michael’s Hospital letterhead)

Title of Research Study:
Effects of Returning to Work on Quality of Life in HIV/AIDS

Site Principal Investigator:
Sergio Rueda, MA, MSc (University of Toronto PhD Student)
Neurobehavioural Research Unit, St. Michael’s Hospital
(416) 864-6060 ext. 6485; Time Availability: Monday to Friday, 9:30 am – 5:30 pm

Co-Investigators:
Cameron Mustard, PhD (University of Toronto Supervisor)
Institute for Work and Health

John Lavis, MD, PhD
McMaster University

Ahmed Bayoumi, MD, MSc, FRCPC
Inner City Health Research Unit, St. Michael’s Hospital

Janet Raboud, PhD
University Health Network

Sean B. Rourke, PhD (St. Michael’s Hospital Supervisor)
Neurobehavioural Research Unit, St. Michael’s Hospital

Study Sponsor:
Canadian Institutes of Health Research (CIHR)

This consent form may contain words that you do not understand. Please ask the study coordinator or any member of the study team to explain any words or information that you do not understand.

Introduction:
Before agreeing to participate in this research study, it is important that you read and understand this research consent form. This form provides all the information we think you will need to know in order to decide whether you wish to participate in the study. If you have any questions after you read through this form, ask your questions to the study personnel. You should not sign this form until you are sure you understand everything on this form.

You are being asked to participate in a research study entitled “Effects of Returning to Work on Quality of Life in HIV/AIDS”. This study is being conducted at St. Michael’s Hospital in collaboration with the AIDS Committee of Toronto (ACT) and the Institute for Work and Health.
The use of combination therapy for HIV disease has resulted in dramatic increases in life expectancy. People living with HIV/AIDS who had thought only a few years ago that going back-to-work was not an option are now considering the possibility of employment. Even though a successful return to work may improve financial situation of those involved, it is less clear whether it has an impact on health.

**Purpose of the Research:**
The main objective of this study is to examine the impact of return to work on health in people living with HIV/AIDS. The secondary objective is to understand factors which influence return to work in people living with HIV/AIDS who are participating in an employment program.

**Inclusion/Exclusion Criteria:**
You are eligible to participate in this study if you have HIV infection or AIDS and you are enrolled in AIDS Committee of Toronto (ACT) Employment Action Program.

**Description of the Research:**
Study participants will be people living with HIV/AIDS who have recently enrolled in the Employment Action Program delivered by the AIDS Committee of Toronto (ACT). A total of 145 participants will be recruited for this study.

You will be asked to complete a questionnaire regarding your employment history, educational background, job-seeking activities, income sources, health status, mood, and quality of life. Should you agree to participate, you will be asked to attend face-to-face interviews at St. Michael’s Hospital every 3 months over a 2-year period, for a total of 9 interview sessions. Each session will be conducted by the study coordinator. Six of the sessions will be no more than 15 minutes in length. Three of the sessions (those conducted at baseline, 1 year, and 2 years) will be no more than 30 minutes in length.

Participation in this study is for research purposes only and will not have any effect on the services you receive from ACT’s Employment Action Program and/or your medical care received at St. Michael’s Hospital. Your health records will not be accessed for the purposes of this study.

All study records will be kept in a locked cabinet in the principal investigator’s office for a duration of 5 years following completion of the study. After this 5-year period, all study records will be destroyed. Your identity will be kept confidential.

**Potential Harms (Injury, Discomforts or Inconvenience):**
There are no known harms associated with participation in this study. Some of the questions are of a personal nature and may make you feel uncomfortable. Please keep in mind that you are not required to answer any questions that may make you feel uncomfortable.

**Women as Research Subjects:**
There are no limitations for women participants.

**Potential Benefits:**
There are no direct benefits in participating in this study. There may be indirect benefits to people living with HIV/AIDS as this study may provide some evidence on the benefits (if any) of returning to work for this population.

Confidentiality and Privacy:
All records identifying you will be kept confidential and, to the extent permitted by the applicable laws and/or regulations, will not be made available to anyone not involved in carrying out the study.

To protect your personal identity, all information provided by you will be identified by a numeric code. Your name will not appear on any publications or reports produced by the study. From the start, up until closure of the study, the investigators will maintain a copy of all site study records in a safe and secure location (locked cabinet). Only the research study personnel will have access to the information collected in the questionnaires.

Reimbursement:
You will receive $25 at each visit for all 9 visits to cover expenses (a total of $225). These expenses may include parking costs, transit fares, taxi fares, or lost wages as a result of participation. If you decide for any reason to stop your participation in this study, you will still be reimbursed for costs incurred before your withdrawal.

Participation and Withdrawal:
Participation in research is voluntary. If you choose not to participate, you will continue to receive the services provided by the ACT Employment Action Program and to have access to customary care at St. Michael’s Hospital. If you choose to participate in this study you can withdraw from the study at any time without any effect on the services you receive from the ACT Employment Action Program or the care you will receive at St. Michael’s Hospital. If you choose to withdraw your participation from this study, the investigators will retain any data collected up until your withdrawal for analysis.

Should you be interested in the results of the study, please do not hesitate to contact Sergio Rueda at (416) 864-6060 ext. 6485.

Contact Persons:
If you have any questions during the course of the study please contact:

Site Principal Investigator  Sergio Rueda  (416) 864-6060 ext. 6485

Research Ethics Board Contact:
If you have any questions as a research participant you may contact Dr. Cliff Ottaway, Chair, Research Ethics Board at 864-6060 Ext 2557.

Consent:
“I acknowledge that the research study described above has been explained to me and that any questions that I have asked have been answered to my satisfaction. I have been informed of the alternatives to participation in this study, including the right not to participate and the right to withdraw without compromising the quality of services received from the AIDS Committee of
Toronto Employment Action Program, or the quality of medical care received at St. Michael’s Hospital for me and for other members of my family. As well, the potential risks, harms and discomforts have been explained to me and I also understand the benefits (if any) of participating in the research study.

I understand that I have not waived my legal rights nor released the investigators, sponsors, or involved institutions from their legal and professional duties. I know that I may ask now, or in the future, any questions I have about the study or the research procedures. I have been assured that records relating to me and my care will be kept confidential and that no information will be released or printed that would disclose my personal identity without my permission unless required by law. I have been given sufficient time to read and understand the above information.

I hereby consent to participate, and have been given a copy of this consent form.”

_________________________________________  _________________
Participant’s Signature                       Date

_________________________________________
Participant’s Printed Name

_________________________________________  _________________
Study Investigator’s Signature               Date

_________________________________________
Study Investigator’s Printed Name

_________________________________________  _________________
Witness’ Signature                           Date

_________________________________________
Witness’ Printed Name
Appendix F

Mediation Analyses Formulas (MacKinnon, 2008)

Regression equations used to investigate mediation in the two mediator model:

\[ Y = i_1 + cS = e_1 \]
\[ Y = i_2 + c'X + b_1M_1 + b_2M_2 + e_2 \]
\[ M_1 = i_3 + a_1X + e_3 \]
\[ M_2 = i_4 + a_2X + e_4 \]

Formulas used to calculate the standard error for single and multiple mediator effects:

Standard Error for Single Mediator Effect (Mastery or Self-Esteem)

\[ s_{\hat{a}_1b_1} = \sqrt{\hat{a}_1^2 s_{\hat{b}_1}^2 + \hat{b}_1^2 s_{\hat{a}_1}^2} \]

Standard Error for Two-Mediator Effect (Mastery and Self-Esteem)

\[ s_{\hat{a}_1b_1+\hat{a}_2b_2} = \sqrt{s_{\hat{a}_1b_1}^2 + s_{\hat{a}_2b_2}^2 + 2\hat{a}_1\hat{a}_2 s_{\hat{b}_1b_2}} \]

Significance testing formulas for single and two-mediator effects:

Total Mediated Effect (Mastery and Self-Esteem) \( = c - c' \)
Upper Confidence Limit \( = (c - c') - (1.96)(Sa_1b_1 + a_2b_2) \)
Lower Confidence Limit \( = (c - c') + (1.96)(Sa_1b_1 + a_2b_2) \)

Single Mediated Effect (Mastery) \( = a_1b_1 \)
Upper Confidence Limit \( = (a_1b_1) - (1.96)(Sa_1b_1) \)
Lower Confidence Limit \( = (a_1b_1) + (1.96)(Sa_1b_1) \)

Single Mediated Effect (Self-Esteem) \( = a_2b_2 \)
Upper Confidence Limit \( = (a_2b_2) - (1.96)(Sa_2b_2) \)
Lower Confidence Limit \( = (a_2b_2) + (1.96)(Sa_2b_2) \)
Appendix G

MOS Social Support Scale Inter-Item Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.75</td>
<td>0.96</td>
</tr>
<tr>
<td>2</td>
<td>0.72**</td>
<td>0.96</td>
</tr>
<tr>
<td>3</td>
<td>0.69** .84**</td>
<td>0.69</td>
</tr>
<tr>
<td>4</td>
<td>0.80** .67** .75**</td>
<td>0.73</td>
</tr>
<tr>
<td>5</td>
<td>0.66** .62** .67** .71**</td>
<td>0.69</td>
</tr>
<tr>
<td>6</td>
<td>0.67** .56** .57** .71** .66**</td>
<td>0.72</td>
</tr>
<tr>
<td>7</td>
<td>0.67** .604* .59** .71** .70** .75**</td>
<td>0.73</td>
</tr>
<tr>
<td>8</td>
<td>0.65** .65** .68** .71** .71**</td>
<td>0.76</td>
</tr>
<tr>
<td>9</td>
<td>0.59** .563* .53** .54** .51** .52** .53** .62**</td>
<td>0.78</td>
</tr>
<tr>
<td>10</td>
<td>0.48** .50** .43** .43** .42** .37** .47** .56** .83**</td>
<td>0.69</td>
</tr>
<tr>
<td>11</td>
<td>0.47** .47** .40** .42** .40** .41** .42** .52** .85** .90**</td>
<td>0.72</td>
</tr>
<tr>
<td>12</td>
<td>0.48** .531* .46** .45** .41** .48** .51** .56** .80** .82** .90**</td>
<td>0.76</td>
</tr>
<tr>
<td>13</td>
<td>0.52** .49** .45** .46** .43** .52** .50** .54** .57** .50** .57** .61**</td>
<td>0.76</td>
</tr>
<tr>
<td>14</td>
<td>0.52** .50** .47** .47** .48** .56** .52** .54** .59** .49** .56** .61** .92**</td>
<td>0.78</td>
</tr>
<tr>
<td>15</td>
<td>0.45** .43** .39** .44** .44** .47** .45** .44** .54** .37** .47** .51** .78** .82**</td>
<td>0.71</td>
</tr>
<tr>
<td>16</td>
<td>0.56** .49** .45** .51** .51** .56** .53** .55** .57** .51** .58** .61** .67** .70** .76**</td>
<td>0.80</td>
</tr>
<tr>
<td>17</td>
<td>0.56** .53** .51** .57** .51** .59** .56** .58** .56** .50** .56** .62** .69** .71** .72** .90**</td>
<td>0.82</td>
</tr>
<tr>
<td>18</td>
<td>0.59** .53** .48** .55** .51** .61** .59** .57** .60** .54** .59** .65** .73** .75** .74** .89** .95**</td>
<td>0.84</td>
</tr>
<tr>
<td>19</td>
<td>0.59** .54** .53** .57** .58** .67** .61** .59** .59** .53** .56** .58** .66** .67** .68** .85** .88** .89**</td>
<td>0.83</td>
</tr>
</tbody>
</table>

** p<0.01 level (2-tailed)