PERCEPTIONS OF CONTROL AND SOCIAL SUPPORT: CORRELATES OF HIV-RELATED SELF-EFFICACY

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This study examines the extent to which locus of control and social support are linked to self-efficacy with regard to disease management in HIV-positive adults. Perceived ability to effectively manage illness was measured with the Self-Efficacy for Managing Chronic Disease Scale. Scores from the Multidimensional Scale of Perceived Social Support and the Multidimensional Locus of Control Scale were used as predictors. The gender-balanced sample ($N = 69$) of HIV+ adults was primarily African-American (65.3%) and European American (30.5%), with a mean age of 47 years ($SD = 8.37$). Correlational analyses suggested significant positive relationships between self-efficacy, social support, and locus of control due to powerful others. A regression analysis found that the model accounted for 23% of the variance in self-efficacy (adj. $R^2=.23$, $F (5, 63) = 4.81, p < .01$), with social support ($\beta = .37, t = 3.28, p < .01$) and locus of control ($\beta = .25, t = 2.26, p < .05$) both significant predictors. Results suggest that social support and locus of control contribute to the belief that HIV can be managed. Interestingly, an *external* locus of control contributed to this belief, perhaps due to the perception of a physician, religious icon, or partner as a “powerful other.” Results suggest that a strong supportive relationship with a trusted other along with enhanced social support typically associated with group-based interventions may improve health outcomes by increasing self-efficacy in disease management in HIV-positive adults.
PERCEPTIONS OF CONTROL AND SOCIAL SUPPORT: CORRELATES OF HIV-RELATED SELF-EFFICACY

Human immunodeficiency virus (HIV) currently affects 1.4 million people nationally and an estimated 33.4 million people worldwide. Locally, an estimated 63,700 people are infected in Texas alone, with approximately 19,888 living in the Dallas/Ft. Worth area (Texas Department of State Health, 2010). Given the prevalence of the HIV epidemic and its overall impact on health, research must identify psychosocial and behavioral factors amenable to clinical intervention to improve wellness in HIV-positive communities.

Health Changes Associated with HIV

Following a positive diagnosis of HIV, clients are encouraged to change their health behaviors to minimize the impact of the virus, both to directly minimize the impact of the illness on overall health functioning, and as a method to reduce illness-related stress which may indirectly influence disease progression (Joint United Nations Programme on HIV/AIDS, 2005). Cigarette smoking (Burns et al., 1996; Shiboski, Neuhaus, Greenspan, & Greenspan, 1999; Diaz et al., 2000), alcohol use (Chen, George, & Sperber, 1998; Samet, Cheng, Libman, Nunes, Alperen, & Saitz, 2007) and poor eating habits (Macallan, 1999; Carr et al., 1999) are all behaviors that should cease following a positive diagnosis.

Conversely, a number of disease-relevant behaviors must be engaged in to enhance overall health. Adherence to antiretroviral medication is critical, as the
characteristics of the HIV virus demands near perfect adherence (Friedland & Williams, 1999) in order to maintain optimal effectiveness. Additionally, safer sex behaviors become necessary to prevent transmission or superinfection with other strains of the virus (Smith, Richman, & Little, 2005), thus limiting potential treatment options. Behavioral changes may become burdensome, but are necessary for wellness.

However, despite the necessity of behavior change, successful lifestyle changes are difficult. Some people are more adherent to improved health behaviors than others (Collins et al., 2001), which suggests that some aspect of the person influences successful behavioral change. Research suggests that health behavior changes are associated with a number of factors, including access to high quality health care (Taylor, 1999), a positive relationship with physicians (Sherbourne et al., 1992), and psychological factors, such as positive coping skills (Turner-Cobb et al., 2002). Another facet of self-care is the basic belief that the person can manage the illness (Fumaz et al., 2008); a belief otherwise known as self-efficacy.

**Self-Efficacy**

Bandura (1977) defines self-efficacy as “the conviction that one can successfully execute the behavior required to produce an outcome.” If a person does not believe that he or she can carry out the behavior necessary to produce a positive outcome, he or she will simply not act. These beliefs can inform the approach a person takes to complete goals and meet challenges as well as the likelihood of confronting the challenge.

Ajzen’s (1985) theory of planned behavior (TPB), an extension of the theory of reasoned action (TRA; Fishbein & Ajzen, 1975), further connects these self-efficacy
beliefs to health behavior change. TRA argues that the intention to behave a certain way is dependent on the person’s attitude regarding that behavior and subjective norms. Thus, the best predictor of behavior is intention, and the best predictor of intention is how the person feels about the behavior and the norms of those around the person.

TPB adds the component of behavioral control to the model. According to Ajzen (2010), the assumption made when developing TRA was the “volitional control over the behavior of interest.” However, this control is not always assured. In fact, people may report various levels of ability to influence an outcome. Because of this, Ajzen added perceived behavioral control, or self-efficacy, to his model as an additional predictor of both intentions and a moderator of the relationship between intentions and behaviors. He concluded that a person’s assessment of the ability to control a behavior was dependent on his or her beliefs about factors that may impede or facilitate the behavior. In the presence of facilitators to a behavior and few barriers, the person develops a greater perception of behavioral control.

Because of stigma and misconceptions about HIV that many in the general populace hold, people who are newly-diagnosed may feel that they have no control over the course of the illness. People with these beliefs, or those who have low self-efficacy, are less confident in their ability to achieve necessary behavioral outcomes and may be less likely to engage in those behaviors than people with high self-efficacy. Therefore, exploring self-efficacy within this particular population may prove especially beneficial.
Self-efficacy is associated with a number of HIV-related health behaviors, including smoking cessation (Hyde, Hankins, Deale, & Marteau, 2008), diet (Bas & Donmez, 2009), antiretroviral medication adherence (Cook, McCabe, Emiliozzi, & Pointer, 2009; Dilorio et al., 2009), and risky sexual activity (Brien & Thombs, 1994; Thomas et al., 2009). Further, self-efficacy is associated with pain management (Altmaier, Russell, Kao, Lehmann & Weinstein, 1993; Litt, 1988; Manning & Wright, 1983) and cardiovascular functioning (Sarkar, Ali, & Whooley, 2009). Self-efficacy is also associated with frequent HIV testing, as well as positive attitudes, in regard to testing and sexual barrier use (Locke and Newcomb, 2008). Because self-efficacy can have increased overall health benefits (Lorig et al., 1996), the identification of barriers and facilitators to the development of self-efficacy is important and would be an important addition to the literature.

Factors Related to Self-Efficacy

Literature suggests two constructs that contribute to self-efficacy. The first is locus of control (Gordijn & Boven, 2009), the extent to which an event’s outcome is perceived as due to the self, due to a powerful other, or due strictly to chance (Rotter, 1966). Though this construct shares a conceptual similarity with self-efficacy, there is a slight difference. Self-efficacy involves the belief that a behavior can be produced which will lead to a desired outcome, whereas locus of control relates to whether or not some future event is controllable at all. Some researchers referred to locus of control as an “outcome expectancy,” or a belief about control over some outcome (Flannery, 1986;
Devins et al., 1982). Therefore, if the results of some action are believed to be controllable, then the actions necessary to achieve these outcomes are more likely to be perceived as possible. In this way, greater levels of locus of control due to the self may be positively associated with higher self-efficacy for managing a chronic disease.

Noting that the construct of locus of control includes multiple dimensions (self, powerful others, and chance), Evans and colleagues (2000) explored these dimensions to determine which dimension was the strongest predictor of positive treatment outcomes. They found a significant link between beliefs about powerful others, particularly doctors and other healthcare professionals, and the use of protease inhibitors, a classification of antiretroviral medication. Further, they found that attributing locus of control to the self or chance was not significantly related to adherence.

Burish and colleagues (1984) similarly suggest that the perception of control over an illness can prove to be a maladaptive coping strategy in the face of repeated attempts and failures to manage the disease. Furthermore, this particular strategy might prove especially maladaptive when the disease in question is at a severe stage. In these late stages, assigning some control to others may ultimately prove to be a healthier and more adaptive option.

Lynam et al. (2009) suggest that the relationship between locus of control and self-efficacy may have direct implications for people working toward health changes; locus of control and self-efficacy were both significant contributors to adherence to antiretroviral therapy. Further, an external locus of control is associated with increased
levels of perceived illness, such that people who believe that the course of illness is out of their hands are more likely to believe they are more ill than people who feel that they are in control (Horner, 1996). If locus of control can be shown to be strongly associated with self-efficacy, then interventions which target locus of control (Inouye, Flannelly, & Flannelly, 2001; Craig, Hancock, Chang, & Dickson, 1998) can be used in therapeutic sessions to improve self-efficacy.

Social support. The second construct that may contribute to self-efficacy is social support. Social support is “the support available to a person or community through social ties to other people, groups, or communities (Davey, Foster, Milton, & Duncan, 2009). The relationship between interpersonal support and improved health received increasing attention in recent years (McDaniel, Campbell, Hepworth, & Lorenz, 2004), with research on the psychological and social factors that contribute to improved health behaviors.

Although HIV is diagnosed individually and is thought to impact a single person, the effects of the virus extend to significant others, families, and communities (Rotheram-Borus, Lee, Gwadz, & Draimin, 2001). Biological, social, and psychological factors all play significant roles in how individuals, couples, and families adapt to illness, and, conversely, how these groups adapt to illness can impact a person’s adjustment to his or her illness. In fact, the impact of the support received can directly inform the treatment plan and adherence within the physician’s office (McDaniel et al., 2004).
Social support directly impacts those infected with HIV in a number of ways, particular with regard to treatment adherence. The supportive group can help to remind a person to take medications, facilitate the taking of medications (i.e., offering food when medication requires food), and offer emotional support when health maintenance becomes difficult (Lyon et al., 2003; Hosek, Harper, & Domainco, 2005). In fact, Song and colleagues (2006) found that with greater support available, medication adherence is improved. Additionally, increased support is associated with reduced substance use and sexual risk taking (Hosek, Harper, & Domainco, 2005).

This relationship between social support and positive health behaviors is well documented, particularly within the HIV community (Davey, Foster, Milton & Duncan, 2009). For example, Abramowitz et al. (2009) found that HIV-infected youth who reported more social support also reported significantly less depression. Further, increased social support is associated with lower viral load and higher CD4+ cell count (Fekete et al., 2009). Additionally, two studies (Belzer et al., 1998; Rao et al., 2007) concluded that HIV-infected adolescents are less likely to adhere to HAART regimens if they report a lack of family support; this social support mitigates the effects of the stigma associated with being HIV-positive, normalizing the experience. Finally, social support is indirectly related to adherence through its relationship with self-efficacy (DiLorio et al., 2009).

Social support can also be negatively related to health, such as when negative interactions with others invokes feelings of stigma and alienation; in fact, in trauma-
exposed individuals, negative social support is a stronger predictor of post-traumatic stress and depression than positive social support (Ullman & Filipas, 2001; Zoellner, Foa, & Brigidi, 1999). Further, negative social support is linked to mood disturbance in people who are HIV-positive (Song & Ingram, 2002). However, Steptoe, O’Donnell, Marmot, and Wardle (2008) found that positive social support is related to positive affect, which, in turn, is associated with more adaptive coping responses to stress and decreased depression, independent of the impact of negative social support. This suggests that positive social support is a more crucial component of health outcomes, as it supersedes the effects of negative social support.

Both locus of control and social support are associated with self-efficacy; however, little research focuses on the magnitude of these relationships, especially in the HIV community. We examined the extent to which locus of control and social support are associated with self-efficacy with regard to disease management. We hypothesized the following:

1. Higher levels of internal locus of control are negatively associated with self-efficacy for managing HIV.
2. Higher levels of external locus of control due to powerful others are positively associated with self-efficacy for managing HIV.
3. Higher levels of social support are positively associated with self-efficacy for managing HIV.
4. Locus of control and social support will account for a significant proportion of variance in self-efficacy.

Method
Participants. The appropriate institutional review board approved the study. Recruitment was solicited through local AIDS service organizations in the Dallas/Ft. Worth metroplex area of Texas via flyers and word of mouth. Participants were recruited as part of an intervention-based research project that explored the effects of enhancing forgiveness as a coping strategy within the HIV community. To be eligible for participation, participants had to be 18 years of age or older, able to produce evidence of an HIV+ status, have sufficient fluency in English to participate in a group, and be available during scheduled group meeting times. Participants were excluded from the study if they were intoxicated or high on substances during the intervention. Written informed consent was obtained from all participants prior to participation. Participants received $15 incentive to complete the survey.

The sample consisted of 69 HIV seropositive men and women (Men = 34, Women = 35; see Table 1). A large proportion of the sample was African American, unemployed, and educated at a high school level. Of the sample, 55% (n = 38) were diagnosed with AIDS and 58% (n = 40) were prescribed antiretroviral medication.
Table 1

*Participant Demographics*

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
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<td>-</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
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</tr>
<tr>
<td>Men</td>
<td>34</td>
<td>49%</td>
</tr>
<tr>
<td>Women</td>
<td>35</td>
<td>51%</td>
</tr>
<tr>
<td><strong>Age (in years)</strong></td>
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<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
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<td>-</td>
</tr>
<tr>
<td>Median</td>
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<td>-</td>
</tr>
<tr>
<td>Range</td>
<td>24 – 66</td>
<td>-</td>
</tr>
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</tr>
<tr>
<td>European American</td>
<td>21</td>
<td>30.5%</td>
</tr>
<tr>
<td>African American</td>
<td>45</td>
<td>65.3%</td>
</tr>
<tr>
<td>Latino/Latina</td>
<td>1</td>
<td>1.4%</td>
</tr>
<tr>
<td>Other</td>
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<tr>
<td><strong>Sexual Orientation</strong></td>
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<tr>
<td>Homosexual</td>
<td>24</td>
<td>34.8%</td>
</tr>
<tr>
<td>Bisexual</td>
<td>4</td>
<td>5.8%</td>
</tr>
<tr>
<td>Heterosexual</td>
<td>41</td>
<td>59.4%</td>
</tr>
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<td><strong>Employment Status</strong></td>
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<tr>
<td>Unemployed</td>
<td>61</td>
<td>88.4%</td>
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<tr>
<td>Part Time</td>
<td>6</td>
<td>8.7%</td>
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<td>Full Time</td>
<td>2</td>
<td>2.9%</td>
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<tr>
<td><strong>Education (in years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>13.2 (3.3)</td>
<td>-</td>
</tr>
<tr>
<td>Median</td>
<td>12</td>
<td>-</td>
</tr>
<tr>
<td>Range</td>
<td>7 - 29</td>
<td>-</td>
</tr>
<tr>
<td><strong>Prescribed HAART</strong></td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>53</td>
<td>76.8%</td>
</tr>
<tr>
<td>No</td>
<td>16</td>
<td>23.2%</td>
</tr>
<tr>
<td><strong>AIDS Diagnosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>38</td>
<td>55.1%</td>
</tr>
<tr>
<td>No</td>
<td>31</td>
<td>44.9%</td>
</tr>
<tr>
<td><strong>Symptom Load</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>16.5 (6.3)</td>
<td>-</td>
</tr>
<tr>
<td>Median</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>3 - 28</td>
<td>-</td>
</tr>
</tbody>
</table>
Measures. Participants completed questions on demographic characteristics, as well as questions assessing HIV-related symptomatology and their most recent CD4 T cell count and viral load at the time of the survey.

Self-efficacy was assessed with the Self-Efficacy for Managing Chronic Disease measure (SEMCD; Lorig et al., 2001), a 6-item measure gauging a person’s confidence in his or her ability to control symptoms related to his or her illness. The SEMCD is measured on a 10-point Likert-type scale. Responses ranged from 1 (not at all confident) to 10 (totally confident). Higher scores indicate greater self-efficacy. Examples of items on this measure include “How confident are you that you can keep the fatigue caused by your disease from interfering with the things you want to do?” and “How confident are you that you can do the different tasks and activities needed to manage your health condition so as to reduce you need to see a doctor?” Internal consistency reliability coefficient (Cronbach’s alpha) for this measure was .91, which is consistent with previous research (Lorig et al., 2001).

Locus of control was assessed with the Multidimensional Health Locus of Control Scales (Wallston et al., 1978), an 18-item measure that assesses a person’s perception of control over his or her health as being due to the self, powerful others, and chance. The scale is divided into 3 subscales – Locus of Control Due to the Self (e.g., “I am in control of my health”), Locus of Control Due to Chance (e.g., “Luck plays a big part in determining how soon I will recover from an illness.”), and Locus of Control Due to Powerful Others (e.g., “Regarding my health, I can only do what my doctor tells me to
do”). Items were scored on a 6-point Likert-type scale, which ranged from 1 (strongly disagree) to 6 (strongly agree). Higher scores on each subscale indicate more control attributed to that particular entity. The alpha reliabilities for the subscales ranged from .67 to .77 (Wallston & Wallston, 1981). Concurrent validity was demonstrated with Levenson’s Internal-External Control Scale (Moshki, Ghofranipour, Hajizadeh, & Azadfallah, 2007).

Social support was assessed with the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988), a 12-item measure assessing perceptions about support received from family members, friends, and others. The sum of all responses was used to gauge total received social support. Items were scored on a 7-point likert-type scale. Responses ranged from 1 (very strongly disagree) to 7 (very strongly agree). Higher scores on each subscale indicate more social support from each of the previously stated groups, with the total score indicating total support received. Internal consistency for this measure ranges from .86 to .90 (Bruwer, Emsley, Kidd, Lochner, & Seedat, 2008). Concurrent validity was demonstrated with the Social Support Behaviors scale (Kazarian & McCabe, 1991).

Design and procedure. This study used a cross-sectional design. After providing written consent, participants completed baseline questionnaires administered via an audio computer assisted survey instrument (ACASI), a computer-based method of data collection. Respondents read and listened to questions as displayed by computers and
responded by selecting the appropriate symbol on the computer screen via mouse. Study staff provided assistance as necessary for individuals with difficulty utilizing the system.

**Data analysis.** Based on previous literature (DiIorio et al., 2009; Lynam et al., 2009; Judge et al., 2002), I anticipated a medium effect size for our results. An a priori power analysis was conducted to determine the sample size required to achieve power of .80, with a medium effect size in a design which utilizes 3 independent variables (G*Power; Faul & Erdfelder, 1992). A sample of 41 participants was required for these analyses. I examined our data for outliers and missing data and appropriate methods to manage any such findings were implemented. Next, I conducted several statistical analyses to test our hypotheses, with our sample size of 69 providing sufficient statistical power.

Data were examined to determine normalcy, with all measures meeting that assumption. I used $t$-tests for independent means to examine differences in self-efficacy, social support, and locus of control based on gender, ethnicity (European American and African American), and sexuality (homosexual and heterosexual); no differences were found between groups. Pearson product-moment correlation coefficients were computed to determine significant relationships between variables of interest and potential demographic covariates which may confound the results of these analyses. Hierarchical regression analyses were conducted to determine the proportion of variance in self-efficacy explained by selected variables of interest, after accounting for demographic variables. Demographic variables were entered simultaneously in the first block of the
regression, with variables of interested entered simultaneously into the second block. Results of these analyses are presented as F-values with beta weights. Analyses and comparisons were conducted using a significance level of 0.05.

Results

Self-efficacy, locus of control, and social support. Average self-efficacy for the sample was 39.9 ($SD = 14.4$), with a range from 6 to 60. The average social support received for the sample was 56.6 ($SD = 22.3$), with a range from 12 to 84. Locus of control due to the self had an average score of 27.6 ($SD = 5.9$), with a possible range of 6 to 36. Finally, locus of control due to powerful others had an average score of 25.7 ($SD = 5.2$) with a possible range of 6 to 36 See Table 2 for alpha reliability coefficients. No significant differences in these measures were found due to gender, ethnicity, or sexuality.

Table 2

*Univariate Statistics Summary*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>Possible Range</th>
<th>Actual Range</th>
<th>$\alpha$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Efficacy</td>
<td>39.3 (14.4)</td>
<td>6-60</td>
<td>6-60</td>
<td>.93</td>
</tr>
<tr>
<td>Social Support</td>
<td>56.6 (22.3)</td>
<td>7-84</td>
<td>12-84</td>
<td>.96</td>
</tr>
<tr>
<td>Locus of Control – Internal</td>
<td>27.6 (5.9)</td>
<td>6-36</td>
<td>6-36</td>
<td>.78</td>
</tr>
<tr>
<td>Locus of Control – Chance</td>
<td>21.2 (8.4)</td>
<td>6-36</td>
<td>6-36</td>
<td>.83</td>
</tr>
<tr>
<td>Locus of Control – Powerful Others</td>
<td>25.7 (5.2)</td>
<td>6-36</td>
<td>6-36</td>
<td>.64</td>
</tr>
</tbody>
</table>
Correlates of self-efficacy. A bivariate correlational analysis was conducted to determine relationships between variables (See Table 2). Self-efficacy for managing a chronic disease was positively correlated with social support ($r = .39, p < .01$), such that more self-efficacy was associated with greater levels of social support. Furthermore, self-efficacy was positively correlated with locus of control due to powerful others ($r = .29, p < .05$), such that greater self-efficacy for managing a chronic illness was associated with attributing more locus of control to powerful others. No significant relationship was found between locus of control due to the self and self-efficacy.

### Table 3

*Correlates of Self-Efficacy*

<table>
<thead>
<tr>
<th>Scale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Gender</td>
<td>-.02</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Employment</td>
<td>-</td>
<td>.07</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.47**</td>
</tr>
<tr>
<td>4. Social Support</td>
<td>-.12</td>
<td>.21</td>
<td>.26</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>5. Internal LOC</td>
<td>.16</td>
<td>-.02</td>
<td>-.02</td>
<td>-.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Chance LOC</td>
<td>-.25*</td>
<td>-.02</td>
<td>-.06</td>
<td>-.07</td>
<td>.35**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Powerful Others LOC</td>
<td>.07</td>
<td>-.04</td>
<td>.15</td>
<td>.08</td>
<td>.67**</td>
<td>.44**</td>
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<tr>
<td>8. Self-Efficacy</td>
<td>.10</td>
<td>.11</td>
<td>.19</td>
<td>.39**</td>
<td>.22</td>
<td>.20</td>
<td>.29*</td>
<td></td>
</tr>
</tbody>
</table>

*Note* *p* < .05, **p** < .01

Predictors of Self-Efficacy. Hierarchical multiple regression was used to assess the predictive ability of locus of control due to powerful others and social support on self-
efficacy for managing a chronic disease. Age, gender, and employment were entered simultaneously into the first block of the model as covariates. Then, locus of control and social support were entered simultaneously into the second block of the model as predictors, with self-efficacy entered as the criterion. The total variance explained by the model as a whole was 23% (adj. $R^2 = .23$, $F(5, 63) = 4.81, p < .01$). Social support was a significant predictor of self-efficacy ($\beta = .37, t = 3.28, p < .01$), as was locus of control due to powerful others ($\beta = .25, t = 2.26, p < .05$; see Table 3).

Table 4

*Regressors of Self-Efficacy*

<table>
<thead>
<tr>
<th>Dependent Variable: Self-Efficacy (SEMC)</th>
<th>Adjusted $R^2$</th>
<th>$\Delta R^2$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
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<td><strong>Control</strong></td>
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<td></td>
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</tr>
<tr>
<td>Age</td>
<td>.09</td>
<td>0.76</td>
<td>.84</td>
<td>1.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.22</td>
<td>0.91</td>
<td>.99</td>
<td>1.0</td>
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<td></td>
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<tr>
<td>Employment</td>
<td>.23</td>
<td>1.42</td>
<td>.83</td>
<td>1.2</td>
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<tr>
<td><strong>Variables of interest</strong></td>
<td>.23**</td>
<td>.22**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Support</td>
<td>.37</td>
<td>3.28**</td>
<td>1.00</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powerful Others LOC</td>
<td>.25</td>
<td>2.26*</td>
<td>1.00</td>
<td>1.0</td>
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</table>

*Note:* Control variables entered in Step 1, variables in step 2; * $p < .05$, ** $p < .01$

**Discussion**

This study investigated the relationship between locus of control, social support, and self-efficacy for managing a chronic disease. It was hypothesized that a locus of control due to powerful others, an internal locus of control, and positive social support
would all be positively associated with self-efficacy. Further, we hypothesized that these three constructs would each explain a significant proportion of variance in self-efficacy.

An internal locus of control was not significantly associated with self-efficacy. However, an external locus of control, control due to powerful others, was positively associated with self-efficacy, suggesting that people who perceive events as being in the control of powerful others felt more capable of handling HIV-related symptomatology than those who did not share a similar view. Perhaps these people perceive physicians, religious icons, or partners as “powerful others.” As suggested by Burish et al. (1984), it may be that relinquishing some degree of control to people deemed “powerful” grants people who are HIV-positive a sense of control over the illness; in effect, assigning responsibility to others may be an adaptive form of coping.

Further, people who receive more social support also report greater self-efficacy. As previously cited, social support is associated with a number of positive health outcomes within the HIV community. This finding adds to the literature by highlighting the positive role of supportive relationships in the lives of those with chronic illness, which also suggests an important role of group-based interventions for the treatment of HIV.

Social support and locus of control were found to be significant predictors of self-efficacy, though it should be noted that it is an external locus of control that contributes to self-efficacy. HIV-infected individuals may seek the comfort of others when managing the illness. The social support received from family and friends, as well as their relationships with others who they perceive as influential on their ability to control
the illness, may contribute to feelings of empowerment and confidence with HIV management.

Although this study adds significantly to the literature, several limitations restrict the generalizability of these results. The cross-sectional correlational design of the study prevents any causal relationships from being inferred. Because of the convenience sample of people with HIV/AIDS from one geographic location, caution should be taken in any effort to generalize to other populations. However, this investigation was part of a small pilot study designed to test the feasibility of an intervention focused on forgiveness as a coping strategy for people who are HIV+. The results of this investigation will provide support for further research into these constructs, encompassing a larger, more representative sample.

These results emphasize the relevance of interpersonal factors in overall health. Persons with HIV face numerous hardships, from complicated medication regimens to stigma; however, positive interactions with and motivation from others may provide the necessary confidence to overcome illness-related difficulties. Further, the impact of a person’s worldview cannot be ignored; clinicians must be aware that the extent to which a person believes he or she can control disease progression may directly impact his or her ability to take appropriate action.

These findings underscore the importance for developing group-based interventions for the enhancement of self-efficacy in HIV+ adults. Interventions that focus on stress management, coping, and effective problem solving for persons who are HIV+ are
associated with increases in self-efficacy and provide participants with skills that make them better suited to handle the stressors associated with chronic illness (Ironson et al., 2005). Furthermore, these groups are associated with biological improvements in health, such as decreases in viral load and increases in CD4 cell count. Finally, participants in group interventions benefit from the support gained from a facilitator and other group participants. Clearly, a group aimed at increasing self-efficacy is likely to demonstrate improvements along a number of domains.

These findings suggest that a key component of self-efficacy is an acceptance of personal limitations; yielding some sense of control to someone perceived as a powerful figure appears to benefit persons who are HIV+. Therefore, clinicians who work with HIV positive adults should assess the client’s awareness of his or her own capabilities. While it may seem counter-intuitive to assist a client in relinquishing some control, possession of a realistic sense of one’s personal abilities may lead to less stress and better utilization of resources.

Future research should examine the effects, if any, of social support and locus of control on specific health behaviors, such as medication adherence; it would be interesting to discern whether self-efficacy leads to action or if it is simply a belief. Further, future research should investigate the role of stress in my model. The perception of stress can be alleviated by social support (Kalichman, DiMarco, Austin, Luke, & DiFonzo, 2003), a sense of control (Evans, Ferrando, Rabkin, & Fishman, 2000), and self-efficacy (Riley & Fava, 2003). A more thorough understanding of the mechanisms
underlying my model will benefit the creation of any interventions targeting these specific constructs.
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