

Applying Self-Determination Theory to the Prediction of Distress and Well-Being in Gay Men With HIV and AIDS¹

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Self-determination theory (Deci & Ryan, 1985, 1991) was used to predict psychological well-being and distress in 48 gay men with HIV, 39 AIDS patients, and 38 HIV-negative control participants. Participants listed 10 to 15 personal strivings and identified their reasons for engaging in each striving. Multiple regression analyses revealed that introjection (engaging in strivings because of an internal sense of obligation or necessity) was associated with increased distress, especially among HIV+ and AIDS participants. Introjection also predicted decreased well-being. Integration (engaging in strivings because they are personally valued and meaningful) was positively related to well-being. Adjustment to a life-threatening illness is influenced by individuals' feelings of autonomy; that is, the extent to which they believe themselves to be the source of their actions.

Self-determination theory (Deci & Ryan, 1985, 1991) views human beings as continually striving to assimilate ongoing experiences into a coherent, organized self (Deci & Flaste, 1995). Personal growth entails integrating new experiences within oneself in order to become a more complex individual. This growth process is referred to as *organismic integration* and is thought to represent a marker of healthy development. Organismic integration is thought to be energized

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primarily by the need for autonomy, which “encompasses people’s strivings to be agentic, to feel like the origin of their actions, and to have a voice or input into determining their own behavior” (Deci & Ryan, 1991, p. 243). The term *need* is not used in the traditional sense of desires, goals, and wants, but rather to refer to basic nutriments or conditions that are necessary for growth. Consequently, a diminished sense of autonomy is expected to be associated with decreased well-being and greater distress (Deci & Ryan, 1985, 1991).

Self-determination theory assumes that individual differences in autonomy can be examined through people’s conscious experience of the reasons behind their goals and actions. These reasons are conceptualized as lying on a continuum of autonomy that ranges from amotivation to extrinsic motivation to intrinsic motivation. *Amotivation* results from not valuing an activity, or not feeling competent to do it (Ryan, 1995). *Extrinsic motivation* refers to doing an activity in order to obtain some separable outcome, such as a reward. *Intrinsic motivation* involves doing an activity simply for the enjoyment of the activity itself, rather than for any instrumental purpose (Ryan, 1995).

Deci and Ryan (1991) further distinguish distinct types of extrinsic motivation that vary in the degree to which they reflect integration of regulations within the self. The least integrated form of extrinsic motivation is labeled *external regulation*, and it involves behaviors that are performed to satisfy an external demand or reward contingency. *Introjection* represents a partially integrated form of extrinsic motivation that involves acting to enhance or maintain self-esteem and a sense of worth. *Identification* is a moderately integrated form of extrinsic motivation that refers to recognizing the personal importance of a behavior and choosing to accept it as part of one’s goals. Full integration is achieved when identified regulations have been assimilated with other aspects of the self. More integrated forms of extrinsic motivation share many qualities with intrinsic motivation, being both autonomous and unconflicted.

The present study focuses on integrated versus introjected reasons for action. Integration involves assimilating regulations and goals into one’s sense of self, typically in the form of important personal values (Ryan, 1995). Introjection occurs when a goal, value, or regulatory process is taken in but not accepted as one’s own. Introjected strivings are experienced as controlled, rather than autonomous, because they are characterized by approval-based pressures related to guilt/anxiety avoidance and self-esteem maintenance (Ryan, Rigby, & King, 1993). Introjection is also associated with emotional incongruence and ambivalence (Ryan, 1995).

The two forms of self-regulation have been shown to yield distinct patterns of emotional experiences (Koestner, Losier, Vallerand, & Carducci, 1996; Vallerand, 1997). For example, a study measured integrated versus introjected forms of self-regulation by inquiring about why people participated in religious activities (Ryan et al., 1993). It was shown that Christians vary in their reasons for

religious participation, with some adults reporting that "I attend church because by going I learn new things," whereas others said that "I attend church because one is supposed to go." The former reason conveys a sense of personal endorsement indicative of integration, whereas the latter conveys a sense of pressure or demand reflective of introjection. Both types of self-regulation were shown to be higher in a group of teenagers who had volunteered to engage in evangelical work than in a less outwardly involved sample of Christian college students. However, the two forms of self-regulation were shown to be related in opposite directions to adjustment. Integration was positively associated with psychological adjustment, whereas introjection was negatively related to adjustment. O'Connor and Vallerand (1990) reported a similar pattern of results.

Integration and introjection have also been examined in the domains of education, leisure, sports, and interpersonal relations (Blais, Sabourin, Boucher, & Vallerand, 1990; Grolnick & Ryan, 1987; Losier, Bourque, & Vallerand, 1993; Pelletier, Fortier, Vallerand, & Tuson, 1995; Vallerand & Bissonnette, 1992; Vallerand, Pelletier, Blais, & Brière, 1993). These studies have generally shown that integration is associated with more positive emotions and adaptive outcomes than is introjection. Such results have been explained in terms of the close link of self-determination with feelings of personal integrity, authenticity, and vitality (Ryan, Deci, & Grolnick, 1995).

Although most research on self-determination theory has focused on specific domains, individuals' general level of integration can be assessed by examining people's relative autonomy across various domains of their lives (Ryan, 1995). Such a general estimate of self-regulation was shown by Sheldon and Kasser (1995) to predict well-being outcomes. These authors required participants to list their personal strivings. *Personal strivings* refer to the types of goals that individuals characteristically seek in their everyday behavior (Emmons, 1989). These strivings reflect people's personality in that they are, "idiographically coherent patterns" (Emmons & King, 1988, p. 1041), and "speak to what people want" (McAdams, 1995, p. 376). Sheldon and Kasser (1995) asked participants to rate each striving for the extent to which it was integrated or introjected. Individuals who reported more integrated, rather than introjected, reasons for their personal strivings displayed higher levels of vitality, self-actualization, and positive affect. Levels of integration also predicted daily variations in physical symptoms, energy, and mood. We used a similar methodology to examine the extent to which integrated and introjected strivings were associated with well-being and distress in gay men who were infected with HIV.

HIV Infection and Psychological Distress and Well-Being

The physical symptoms and the psychosocial stresses that individuals with HIV infection must confront have prompted research focusing on psychological

distress in these populations.³ In several studies, HIV-positive (HIV+) individuals and those with AIDS reported higher rates of psychological distress, which includes levels of depression and anxiety, than did controls (Lamping & Sewitch, 1990). Findings are mixed concerning the level of distress among HIV+ individuals, compared to those with AIDS. In some studies, HIV+ gay men showed higher levels of distress (Atkinson et al., 1988; Tross & Hirsch, 1988) and a higher prevalence of psychiatric disorders (Atkinson et al., 1988) than did gay men with AIDS. In contrast, Fleishman and Fogel (1994) found no significant difference between HIV+ and AIDS patients, with over 40% of both samples scoring above a cutoff for clinically significant depressive symptoms on a shortened version of the Center for Epidemiological Studies Depression scale (*CES-D*; Radloff, 1977).

Because of the focus on psychological distress, less is known about levels of well-being among infected individuals. Well-being is generally defined in terms of positive affect and satisfaction with life (Diener, 1984), and it is independent from psychological distress (Diener & Emmons, 1985; Watson & Kendall, 1990). Thus, the high levels of psychological distress that are usually associated with HIV infection do not necessarily imply the absence of positive affect. Many individuals with chronic or life-threatening conditions are able to adjust psychologically; some even succeed in maintaining or improving their levels of well-being and the quality of their lives (Collins, Taylor, & Skokan, 1990; Taylor, 1983; Tempelaar et al., 1989).

The present study seeks to obtain a broad assessment of the emotional experiences of gay men with HIV or AIDS by measuring both distress and well-being. It also examines whether the nature of individuals' personal strivings can predict distress and well-being in these populations. No studies have looked at self-regulation variables and their role in adjustment to HIV and AIDS.

Based on self-determination theory, we expect that integrated reasons for engaging in personal strivings will predict increased well-being and decreased distress, whereas introjected reasons will be linked to decreased well-being and greater distress. Furthermore, we expect that the relation of self-determination variables to distress and well-being will be especially strong among men with HIV and AIDS. Compared to HIV-uninfected gay men, HIV-infected individuals must cope with additional stressors, including the stigmatization that is related to the disease; possible social rejection and isolation; limitations on vocational, social, and recreational activities; and uncertainty regarding the disease's progression. These HIV-related stressors can pose a serious challenge to the integrity of their sense of self. HIV-infected individuals might feel that the disease or

³In this paper, the term *HIV+* indicates the presence of an HIV infection that has not yet progressed to the stage that causes physical illness. The term *AIDS* refers to an HIV infection that has progressed sufficiently to produce one or several additional physical illnesses that are direct complications of the severe immune system weakness induced by HIV.

fate is in control of their lives. They might begin to question the purpose and meaning of their lives. Thus, HIV-infected individuals' sense of autonomy might be especially vulnerable. In this context, experiencing day-to-day personal strivings as integrated expressions of the self might be an especially potent buffer against experiencing distress. Conversely, experiencing strivings as based on poorly integrated, introjected reasons might be especially malignant and might lead to high levels of distress.

Distress was assessed in terms of depression and anxiety; well-being was assessed in terms of self-esteem and life satisfaction. Introjected and integrated reasons for engaging in personal strivings were the primary predictor variables. We hypothesized that integration and introjection were major determinants of both distress and well-being and that self-determination variables interacted with disease status. That is, integration was expected to be associated with positive outcomes, whereas introjection was expected to be associated with negative outcomes, and these relations were expected to be stronger among infected gay men. Recruitment of study participants occurred between November 1993 and November 1994, a period that preceded the use of the potent new anti-HIV drugs.

Method

Participants

The sample of participants was the same as Igraja et al.'s (in press) sample. We examined distress and well-being in HIV+ gay men ($n = 48$), gay men with AIDS ($n = 39$), and HIV-negative (HIV-) gay male controls ($n = 38$). Participants were diagnosed as having AIDS if they had experienced one of the 23 opportunistic infections identified by the Centers for Disease Control (CDC, 1993). The participants with HIV (M CD-4 count = 421.87, $SD = 237.59$) and AIDS (M CD-4 count = 125.53, $SD = 127.79$) were recruited from the immunodeficiency clinics at the Montreal Chest Institute of the Royal Victoria Hospital and the Montreal General Hospital, or from support groups at the McGill University AIDS Center. The HIV- subjects were gay male friends or acquaintances of the patients. They received information about the study from an HIV+ or AIDS participant, and were asked to call the investigator if they thought that they might be interested in participating in the investigation.

Procedure

A form describing the study and its requirements was posted in the waiting room of the two hospital clinics. Prospective participants agreed to be contacted by the investigator. The participants who were recruited from the support groups were informed of the study by their group leaders. Informed consent was

obtained prior to testing, which took place either at the clinics, at McGill University, or at the patient's home. Part 1 of the testing procedure involved completing measures that assessed demographic information, personal strivings, levels of self-determination, satisfaction with life, and depression. The participants also completed other measures, which are not relevant to the present report. Part 1 required approximately 90 min. The participants were given the choice to complete Part 2, which took approximately 30 to 45 min, during the testing session or at home. This involved completing scales assessing self-esteem and anxiety.

Participants were tested in either French or English, depending on their preference. A graduate student in clinical psychology, who also worked as a professional translator, translated all study materials and questionnaires into French. A completely bilingual graduate student in clinical psychology reviewed the translations. Questions concerning translation were resolved by conference.

Measures

Demographic information questionnaire. Participants completed a brief form including questions regarding their age; the highest level of education they had completed; whether or not they were presently employed; their income; the language they spoke (i.e., French or English); and, in the case of HIV+ and AIDS patients, their CD-4 count.

Personal striving lists. Emmons (1986) described the personal striving methodology. The participants were asked to think about the goals or objectives that they were typically trying to accomplish or attain. They were asked to complete the open-ended stem "I typically try to . . ." Participants were encouraged to think about the goals that they were trying to accomplish in four life domains: work and school, home and family, social relationships, and leisure/recreation. These goals could be general or specific, positive or negative, and recurring rather than occasional. The instructions also highlighted the importance of choosing goals that the participants were trying to attain, regardless of whether or not they had been successful. The participants were asked to generate between 10 and 15 strivings. The personal strivings were then used to establish the extent to which participants' reasons for behaving were self-determined, using the Striving Motivation Questionnaire.

Striving Motivation Questionnaire (SMQ). Introjective and integrated self-regulation were measured using the 14-item SMQ (Table 1). We wrote the SMQ items to sample the continuum from less self-determined ("I would not want to disappoint others"; "I avoid feeling ashamed or guilty") to more self-determined reasons for behaving ("I find it meaningful"; "It is very interesting"). Using a 7-point Likert-type scale (1 [*does not correspond*], 4 [*corresponds moderately*], 7 [*corresponds exactly*]), the participants rated the extent to which the 14 SMQ items corresponded to their reasons for engaging in each of their personal

Table 1

Factor Loadings for Items on the Striving Motivation Questionnaire

Items	Factor 1 (Integration)	Factor 2 (Introjection)
1. I choose to for my own good.	.63	
2. I find it satisfying.	.81	
3. I feel I have to or that I should.		.73
4. I want the important people in my life to approve of me.		.74
5. It will help me bring together different parts of my life.	.63	
6. I avoid feeling ashamed or guilty.		.81
7. It is very interesting.	.86	
8. I think it's important.	.61	
9. I'll feel bad if I don't.		.79
10. I would not want to disappoint others.		.79
11. I find it meaningful.	.75	
12. I freely choose to in order that I may achieve other important goals.	.72	
13. It pays off; I get something else in return.		
14. Trying to attain this striving is truly enjoyable.	.86	

Note. Participants were asked to indicate the extent to which the reasons corresponded with their own reason for engaging in the striving, using a 7-point Likert-type scale ranging from 1 (*does not correspond*) to 7 (*corresponds exactly*). Loadings below .40 are omitted.

strivings. Scores for the SMQ items were obtained by averaging over all of the participants' reported strivings.

A principal-components analysis was conducted on the scores for the 14 SMQ items. Four factors had eigenvalues that were equal to or greater than 1 (5.55, 2.43, 1.18, and 1.00). We decided to retain two factors because only one item loaded on each of the last two factors. The scree test also supported retaining two factors. An oblique (promax) rotation produced two factors that were somewhat correlated, $r(124) = .32, p < .001$. The rotated factors uniquely explained 29% and 21% of the variance, respectively. As can be seen in Table 1, Factor 1 loaded primarily on items representing integrated self-regulation, with a few items representing identified or intrinsic reasons. A close association

between identified, integrated, and intrinsic reasons would be expected because they are adjacent to one another on Deci and Ryan's (1991) continuum of levels of autonomy in self-regulation. For ease of expression, the factor will be referred to as *Integration*. Factor 2 loaded on items representing introjected self-regulation and will be referred to as *Introjection*.

Data analyses were conducted using the factor scores. Because Cronbach's alpha is not applicable to factor scores, we estimated the reliability of the factor scores by constructing approximate factor scores. The approximate factor scores were obtained by summing scores on the SMQ items that had loadings of .40 or higher on the corresponding factor. The approximate factor scores correlated over .98 with the exact factor scores. Alpha for the approximate Integration factor was .88; alpha for the approximate Introjection factor was .83.

CES-D. The CES-D (Radloff, 1977) was designed to assess depressive affect in the general population. It includes 20 items related to depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite, and sleep disturbance. Participants reported the frequency of each of the symptoms during the past week on a 4-point scale ranging from 1 (*rarely or none of the time*) to 4 (*most or all the time*).

The CES-D has good internal consistency and moderate test-retest reliability across a wide range of subsamples (Hays, Turner, & Coates, 1992; Roberts, 1980; Roberts & Vernon, 1983). The CES-D correlates moderately with other measures of depression (Lewinsohn & Terri, 1982; Radloff, 1977).

Anxiety subscale of the Symptom Checklist. The anxiety subscale of the Symptom Checklist (SCL-90-R; Derogatis, 1977) measures self-reported anxiety. This 10-item subscale assesses symptoms that are usually associated with anxiety (i.e., nervousness, tension, and panic), as well as cognitive components of anxiety, such as feelings of apprehension and dread. Subjects rated on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*) the amount of discomfort caused by the symptoms during the past week.

The anxiety subscale of the SCL-90-R has shown high levels of both internal consistency ($\alpha = .85$) and test-retest reliability ($r = .80$). High convergent validity with the anxiety subscale of the Minnesota Multiphasic Personality Inventory (MMPI) has also been demonstrated (Derogatis, Rickels, & Rock, 1976).

Satisfaction With Life Scale. The Satisfaction With Life Scale (Diener, Emmons, Larson, & Griffin, 1985) was designed to assess respondents' evaluative judgments of their lives as a whole. Participants rated the five items on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Items include "In most ways, my life is close to my ideal," and "If I could live my life over, I would change almost nothing."

The scale has shown high levels of internal reliability (Cronbach's alpha coefficients ranging from .86 to .90) and 2-month test-retest reliability ($r = .82$). The scale also has good concurrent and construct validity. It correlates positively with

self-esteem ($r = .54$) and negatively with neuroticism ($r = -.48$; Diener, 1984; Diener et al., 1985). It is unrelated to social desirability (Diener et al., 1985; Emmons & Diener, 1986).

Rosenberg Self-Esteem Scale. Self-esteem was measured by the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Participants were asked to rate the 10 items on a 4-point scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Total scores were obtained by summing the 10 scores (with appropriate reversals), and ranged from 10 to 40, with higher scores indicating greater self-esteem. Scores on the Rosenberg Self-Esteem scale were found to be associated with negative affect (Kernis, Cornell, Sun, Berry, & Harlow, 1993) and psychological well-being in the general population (Ryff, 1989), and with social support in gay men who were considered to be at risk for the development of HIV (O'Brien, Wortman, Kessler, & Joseph, 1993).

Results

The results are presented in three sections. First, we examine group differences in demographic variables and the dependent and independent variables. Second, we report correlations between the independent and dependent variables. Finally, we present hierarchical multiple regression analyses (Cohen & Cohen, 1983) using the self-determination variables as predictors of distress and well-being.

Statistical power was analyzed using the GPOWER (Erdfelder, Faul, & Buchner, 1996) program. In multiple regression analysis, the index of effect size is f^2 , the proportion of variance in the dependent variable that is uniquely explained by a predictor or set of predictors. For the main effect of each self-determination variable, the effect size that could be detected with 80% power and alpha set at .05 was .066. For the interactions of group and the self-determination variables, the corresponding effect size was .079. Cohen (1988) suggested that effect sizes of .02 can be considered "small," and that effect sizes of .15 can be considered "medium." Thus, the design was adequate to detect effects of small to medium size.

Group Differences

Demographic variables. Demographic data for the three groups of participants are summarized in Table 2. The three subject groups did not differ significantly on age ($M = 37.0$ years, $SD = 8.30$) or level of education. Significant differences were found for language spoken, $\chi^2(2, N = 125) = 11.91, p < .01$; employment status, $\chi^2(2, N = 125) = 18.85, p < .001$; and yearly income, $\chi^2(6, N = 125) = 16.34, p < .05$. There were fewer French-speaking participants in the HIV+ group than in the HIV- and AIDS groups. Compared to the two patient

Table 2

Distributions by Group of the Demographic Variables

	AIDS (<i>n</i> = 39)		HIV+ (<i>n</i> = 48)		HIV- (<i>n</i> = 38)	
	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>
Language spoken (French)	79.50	31	41.67	20	65.79	25
Employment status (working)	12.80	5	37.50	18	60.53	23
Education level						
Less than high school	10.26	4	10.42	5	7.89	3
High school graduate	43.59	17	39.58	19	36.84	14
CEGEP graduate ^a	17.95	7	20.83	10	23.68	9
University graduate	28.21	11	29.17	14	31.58	12
Income						
< \$10,000	58.97	23	52.08	25	23.68	9
\$10,000-19,999	17.95	7	22.92	11	31.58	12
\$20,000-29,999	12.80	5	14.58	7	10.53	4
≥ \$30,000	12.80	5	10.42	5	34.21	13

^aCEGEP is the equivalent of a junior college in the province of Quebec.

groups, HIV- participants were less likely to be unemployed and were less likely to be earning less than \$10,000 per year.

Dependent and independent variables. Mean scores for the dependent and independent variables for the three groups are presented in Table 3. One-way ANOVAs were conducted to examine group differences. There were no significant group differences for introjected and integrated self-regulation.⁴ Although no significant group differences were found for the dependent variables, the means for the CES-D and for the anxiety subscale of the SCL-90-R were lower in the HIV- group than in the HIV+ and AIDS groups.

Scores on the CES-D and the anxiety subscale of the SCL-90-R were highly correlated, $r(122) = .72, p < .001$, as were scores on the Satisfaction With Life scale and the Rosenberg Self-Esteem Scale, $r(121) = .69, p < .001$. Consequently, each set of measures was first standardized and then averaged. The resulting scores were labeled the *distress* and *well-being* variables. These two composite

⁴We also calculated correlations within the HIV+ and AIDS groups between introjected and integrated self-regulation and two measures of disease progression: CD-4 cell count and number of HIV-related symptoms. None of the correlations was significant, suggesting that self-regulatory style was not related to disease progression.

Table 3

Means and Standard Deviations of the Dependent and Independent Variables

	AIDS (<i>n</i> = 39)		HIV+ (<i>n</i> = 48)		HIV- (<i>n</i> = 38)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dependent variables						
CES-D	20.28	10.83	18.60	14.00	15.53	10.76
SCL-90-R-anxiety	11.95	8.66	11.04	9.55	8.18	6.45
Distress	0.31	1.73	0.10	2.14	-0.49	1.47
SWLS	20.90	6.31	19.23	7.56	20.82	7.84
RSE	30.23	5.61	30.56	5.83	31.34	5.15
Well-being	0.04	1.77	-0.16	1.91	0.20	1.85
Independent variables						
Introjection	-0.02	0.87	0.07	0.96	-0.10	1.16
Integration	-0.09	1.08	0.09	0.87	-0.06	1.08

Note. CES-D = Center for Epidemiological Studies Scale; SCL-90-R-Anxiety = Anxiety subscale of the Revised Symptom Checklist; SWLS = Satisfaction With Life Scale; RSE = Rosenberg Self-Esteem Scale.

scores were moderately correlated, $r(123) = -.54, p < .001$. The overall *F* test comparing the three groups on distress was not significant. However, the linear contrast comparing the three groups was nearly significant, $F(1, 122) = 3.62, p < .06$, indicating that there was a linear increase in distress from the HIV- group to the HIV+ group to the AIDS group. In the case of well-being, both the overall *F* test and the linear contrast were not significant. The three groups did not differ significantly on well-being.

Correlations Between Self-Determination Variables, Distress, and Well-Being

Table 4 presents correlations between the dependent and independent variables in the combined sample. As expected, introjection was positively associated with distress and negatively associated with well-being. Integration was positively correlated with well-being, but was unrelated to distress.

Hierarchical Regression Analyses

Hierarchical multiple regressions were first performed to examine the influence of the demographic variables on distress and well-being. Separate analyses

Table 4

Correlations of Self-Determination Variables, Distress, and Well-Being

Variable	Distress	Well-being	Introjection
Distress			
Well-being	-.54***		
Introjection	.43***	-.33***	
Integration	.02	.32***	.31***

*** $p < .001$.

were conducted for each demographic variable. For all analyses, the demographic variable was entered first, followed by the group variable, and finally the Demographic \times Group interaction. The variables tested were language spoken, level of education, employment status, and income (education and income were treated as continuous variables in these analyses). None of the interaction terms was significant. Participants who had less education reported more distress, $F(1, 119) = 9.63, p < .01$. Language spoken was a significant predictor of well-being, $F(1, 119) = 4.61, p < .05$. Subjects who were French-speaking reported higher well-being than did other subjects. Because only one demographic variable (language) was related to both group and either distress or well-being, it is unlikely that any apparent effects of group membership were actually attributable to demographic factors. Nevertheless, the subsequent multiple regression analyses were conducted controlling for education, employment status, language spoken, and income.

Distress. Hierarchical multiple regressions were used to evaluate the relations between integrated and introjected self-regulation and distress. To facilitate interpretation of the results, all variables were standardized prior to the analyses. Blocks of predictor variables were then entered in four steps. Table 5 summarizes the results for each step. The four demographic variables were entered first (Step 1), followed by two vectors coding for group membership (Step 2). The main effects of introjection and integration were entered together in Step 3, followed by the product terms representing the interactions of group and the two self-determination variables (Step 4).

The block of demographic variables was a significant predictor of distress. However, only education was significant in its own right, $pr = -.24, sr^2 = .045, t(120) = -2.42, p < .05$. Group did not add significantly to the prediction of distress (Step 2). The block of self-determination variables was significant (Step 3). As predicted, distress was positively related to introjection, $pr = .43, sr^2 = .156, t(116) = 4.94, p < .001$, and somewhat negatively related to integration, $pr = -.15,$

Table 5

Hierarchical Multiple Regression With Distress Predicted From Self-Determination Variables

Variables added at each step of the regression analysis	R^2	% of increase in variance	Error df	F	p
Step 1: Demographic variables	.085*	8.53	120	2.80	.03
Step 2: Group	.103*	1.80	118	1.19	.31
Step 3: Introjection and Integration	.259***	15.60	116	12.22	.00
Step 4: Group \times Introjection; and Group \times Integration	.307	4.80	112	1.94	.11

Note. Distress was regressed on the demographic variables (Step 1), the group variable (Step 2), the motivational variables (Step 3), and the interaction of group and motivational variables (Step 4). % of increase in variance = Percentage of increase in explained variance in distress for each step.

* $p < .05$. *** $p < .001$.

$sr^2 = .018$, $t(116) = -1.70$, $p < .10$. The entire set of interactions of group and the self-determination variables was marginally associated with distress, $p = .11$ (Step 4). The interaction of group and introjection approached significance, $F(2, 112) = 2.77$, $p < .07$; the interaction of group and integration was clearly nonsignificant, $p < .50$. Because the interaction involving introjective self-regulation was predicted, we decided to interpret it.

We probed the interaction using the techniques presented by Aiken and West (1991) for calculating and testing simple slopes within groups. A *simple slope* is the regression coefficient of the dependent variable on one of the independent variables, at a fixed value of the other independent variable (i.e., within one of the groups). Because the predictor variables and distress were standardized, the simple slopes can be interpreted as the increase in distress, expressed in *SD* units, that would be predicted from an increase of 1 *SD* in the predictor variable. The simple slope of distress on introjection was significant for the HIV+ group, $b = .67$, $t(112) = 4.72$, $p < .001$; and the AIDS group, $b = .43$, $t(112) = 2.54$, $p < .02$; but not for the HIV- group, $b = .20$, $t(112) = 1.39$, $p > .05$. Analyses of contrasts revealed that the slope for the pooled HIV+ and AIDS groups was larger than that for the HIV- group, $t(112) = 1.96$, $p = .05$. There was no significant difference between the slopes for the HIV+ and AIDS groups.

Well-being. The same multiple regression analysis was conducted with well-being as the dependent variable. The results are summarized in Table 6. The

Table 6

Hierarchical Multiple Regressions With Well-Being Predicted From Self-Determination Variables

Step and variables added	R^2	% of increase in variance	Error df	F	p
Step 1: Demographic variables	.106**	10.62	120	3.57	.01
Step 2: Group	.108*	0.18	118	0.12	.89
Step 3: Introjection and integration	.370***	26.17	116	24.08	.00
Step 4: Group \times Introjection; and Group \times Integration	.410***	4.02	112	1.91	.11

Note. % of increase in variance = Percentage of increase in explained variance in well-being.

* $p < .05$. ** $p < .01$. *** $p < .001$.

block of demographic variables significantly predicted well-being. However, only language spoken was significant in its own right, $pr = .48$, $sr^2 = .053$, $t(120) = 2.66$, $p < .01$. Group membership was not a significant predictor of well-being (Step 2). The block of self-determination variables was highly significant (Step 3). As expected, well-being was negatively related to introjection, $pr = -.44$, $sr^2 = .169$, $t(116) = -5.57$, $p < .001$; and was positively related to integration, $pr = .46$, $sr^2 = .171$, $t(116) = 5.62$, $p < .001$. The interactions of group and the self-determination variables were marginally significant as a block (Step 4). The interaction of group and integration approached significance, $F(2, 112) = 2.62$, $p < .08$; the interaction of group and introjective self-regulation was clearly non-significant, $p < .50$.

Because the interaction involving integration was predicted, we decided to test the simple slopes. The simple slope of well-being on integration was significant for the HIV- group, $b = .68$, $t(112) = 4.40$, $p < .001$; and the AIDS group, $b = .50$, $t(112) = 3.84$, $p < .001$; but was smaller in the HIV+ group, $b = .23$, $t(112) = 1.76$, $p < .10$.

Discussion

The present study was the first to use self-determination theory to predict distress and well-being in gay men with HIV and AIDS. Self-determination theory posits that human beings possess a fundamental need to feel autonomous, that is, to act with a sense of volition and choice. The theory assumes that there are

individual differences in the extent to which individuals are able to integrate experiences and regulations into their sense of self and to feel like the origin of their actions (Deci & Ryan, 1985, 1991). Integration occurs when goals are personally valued and meaningful, while introjection occurs when objectives and values are accepted mostly to avoid anxiety/guilt or to maintain self-esteem. It was predicted that introjected self-regulation would be associated with increased distress and decreased well-being. Integrated self-regulation was expected to be related to greater well-being and less distress. We also predicted that the effects of introjection and integration would be stronger among individuals with HIV and AIDS, compared to HIV- gay men.

One might expect integration and introjection to be opposite poles of one dimension. Indeed, Sheldon and Kasser (1995), using the personal-strivings methodology, computed a single self-determination score for each participant by subtracting the introjected scores from the integrated scores. We believe that integrated and introjected self-regulation need not be negatively correlated, and this was supported by our data. An individual may have a number of reasons for engaging in a particular striving. For example, a person may devote many hours to school work because she enjoys studying (integrated self-regulation), but she may also feel pressured by her parents to succeed in school (introjected self-regulation). Because individuals have multiple strivings, it is also possible that they have different reasons for engaging in them. Consequently, a person who endorses integrated reasons for strivings does not necessarily fail to endorse introjected reasons.

Introjection

Introjection had pervasive, pernicious effects, increasing distress and decreasing well-being. Consistent with previous studies using samples from the general population (e.g., Sheldon & Kasser, 1995), we showed that introjected reasons for pursuing strivings predicted distress. Feeling the need to comply with external pressures and constraints may lead the individual to perceive that his or her behavior is dictated by sources outside the self. The person's basic need to feel autonomous is unfulfilled, and this may represent an important source of distress. In addition, the prediction that the relation between introjection and distress would be especially pronounced among HIV+ and AIDS patients was supported. Pursuing goals in the hope of avoiding guilt and shame may exacerbate the feelings of helplessness and alienation that are already associated with the illness.

Choosing goals on the basis of externally and internally imposed demands and constraints thwarts the human need for autonomy and is thought to lead to decreased well-being. As predicted, introjection was also associated with lower levels of well-being. However, our results failed to demonstrate a significant Group \times Introjection interaction on levels of well-being. The adverse effect of

introjection on well-being was no stronger among HIV+ and AIDS participants than among HIV- participants.

Integration

As predicted by self-determination theory, integration predicted higher levels of well-being. Experiencing one's strivings as freely chosen and consistent with the self may contribute to well-being in multiple ways. First, it may lead to greater engagement and commitment to the activity, which in turn may lead to greater enjoyment and more positive outcomes. Deci and Flaste (1995) suggested that "having a choice engenders willingness. It encourages people to fully endorse what they are doing; it pulls them into the activity" (p. 34). Furthermore, a sense of autonomy facilitates the assimilation of experiences into a coherent self, leading to greater organismic integration (Deci & Ryan, 1991). Persons who experience greater integration are likely to feel more positively about themselves and to be more satisfied with their lives—that is, to have greater subjective well-being. However, contrary to our predictions, the influence of integration on well-being was not stronger among HIV+ and AIDS individuals than among controls.

In the sample as a whole, having integrated reasons for pursuing strivings was only marginally related to lower levels of distress, and there was no evidence that the protective effect of integration was stronger for the HIV+ and AIDS groups. The sense of autonomy that results from engaging in personal strivings because of integrated reasons may be more powerful as a source of well-being than as a buffer against experiencing distress.

Implications

We showed that HIV+ and AIDS individuals reported well-being levels similar to those of controls. This suggests that although adjustment to a life-threatening illness is a very difficult and distressing process, people who are infected with HIV can still experience positive self-esteem and satisfaction with everyday life. As well, we showed that infected individuals do not differ from controls in predictors of distress and well-being, with the exception of the stronger link between introjection and distress among HIV+ and AIDS participants. This finding suggests that the psychological mechanisms underlying the mental health of people with HIV or AIDS are in many respects similar to those of HIV- individuals.

Our findings also have implications for psychological interventions with HIV+ and AIDS individuals. Because introjection and integration were shown to be independent predictors of distress and well-being in our sample, therapists should attend to these two forms of self-regulation separately. Deci and Flaste

(1995) suggested that in order to increase patients' levels of self-determination, therapists should be autonomy-supportive. They should provide choice to patients, let them set their own objectives, and encourage them to take part in all of the decisions that concern them. In parallel, therapists should help patients to become aware of when they are acting on the basis of introjected motivation—that is, when they are complying to pressures and constraints. Patients should be encouraged to reconsider the reasons they are engaging in particular strivings, and could even be led to reconsider the necessity of some of these strivings.

Methodological Issues

Certain limitations of the present study must be acknowledged. First, the participants were recruited to the study before the introduction of the new anti-HIV drugs that greatly reduce the physical symptoms associated with this illness. Because these medications have brought hope to patients, it is possible that the links found between certain predictors and psychological distress and well-being may not apply to the patients being treated with the new drugs. However, a number of infected individuals do not have access to these new treatments (largely because of cost), some do not respond to them, and those who do must cope with complex treatment regimens, side effects, and an uncertain prognosis. What needs to be assessed next is the extent to which our results are generalizable to other infected individuals, including women and heterosexuals, as well as patients with other life-threatening illnesses. This information would be useful to develop a comprehensive model of the role of motivational processes in adjustment to chronic diseases.

Second, the sample consisted of volunteers who read an advertisement describing the study at the immunodeficiency clinic. The results may have been different had we tested all of the patients being admitted to the immunodeficiency clinic. Nevertheless, the mean scores on depressive affect (CES-D) reported by the HIV+ and AIDS groups in the present study were within the range of CES-D mean scores reported in the literature. This suggests that the groups in this study were similar to other HIV and AIDS groups at that point in time.

Third, all of the measures were self-report instruments. Although the participants were in the best position to describe their reasons for engaging in their strivings, it would have been desirable to have additional measures, from an external perspective, of their adjustment. In future research, clinic staff or significant others might provide such ratings.

Fourth, we used a cross-sectional design. Although regression analyses are concordant with causal models, they do not provide direct evidence of causality. We cannot rule out the possibility that levels of well-being and distress influence the nature of HIV-infected people's strivings or their reasons for engaging in

those strivings. Longitudinal research is needed to demonstrate that self-determination variables are prospective predictors of adjustment to HIV infection.

The present investigation confirmed the value of self-determination theory in understanding distress and well-being in gay men with HIV or AIDS. The patients' perceptions regarding the source of their goals and strivings play an important role in their everyday levels of adjustment. Researchers and clinicians interested in the psychological state of HIV+ and AIDS individuals can benefit from considering issues related to self-determination.

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