Avoidance Personal Goals and the Personality–Illness Relationship

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Three studies demonstrated that avoidance personal goals are positively related to physical symptom reports. These results were obtained (a) using both longitudinal and retrospective methodologies and (b) controlling for neuroticism and other alternative predictor variables. In 2 of the studies, a process model was validated in which perceived competence and perceived controlledness were shown to mediate the observed relationship between avoidance goals and symptomatology. Specifically, avoidance goals predicted perceived competence and perceived controlledness, and these variables in turn predicted longitudinal and retrospective symptom reports. Ancillary results help clarify the unique roles of neuroticism and avoidance goals as predictors of physical symptomatology.

Since the Roman physician Galen proposed an association between humoral imbalance and disease, thinkers from a broad array of disciplines have contemplated the link between personality and physical illness. Within the domain of (modern) personality psychology, interest in this issue dates back to Freud's work on the psychodynamics underlying hysterical paralysis (and related conditions). Although interest has waxed and waned over the years, researchers and theorists are currently allocating a great deal of attention to the nature of the personality–illness relationship (Suls, David, & Henry, 1996; Wiebe & Smith, 1997).

Contemporary research on the personality–illness relationship takes many forms (for reviews, see Michaels, Michaelis, & Peterson, 1997; Wiebe & Smith, 1997), but a majority of the work highlights the explanatory role of dispositions or coping strategies. Dispositional approaches focus on broad, nomothetic propensities and articulate how these constructs affect illness, either directly, in interaction with stress, or through their influence on situation selection or health behavior (Bolger & Schilling, 1991; Maddi, 1990; Pennebaker & Watson, 1991). Numerous dispositional constructs have been investigated, including neuroticism, Type A personality, hardness, optimism, hope, inhibited power motivation, and pessimistic explanatory style (for reviews, see Davidson & Pennebaker, 1996; Friedman & Booth-Kewley, 1987). Coping approaches focus primarily on situation-specific responses to stressful events and how these person–environment transactions affect illness (Contrada, Leventhal, & O'Leary, 1990; Lazarus, 1990; cf. Carver, Scheier, & Weintraub, 1989). Several coping strategies or sets of strategies have been investigated, including self-blame; wishful thinking; problem- and emotion-focused coping; active and avoidant coping; and task-, emotion-, and avoidance-oriented coping (for reviews, see Carver & Scheier, 1994; Suls et al., 1996).

Personal Goals and Physical Illness

Although the study of dispositions and coping strategies has yielded many insights into the personality–illness relationship, several theorists have acknowledged the need for more person-centered (i.e., idiographic) and future-oriented approaches to complement existing formulations (Coyne & Gottlieb, 1996; Michaels et al., 1997; Ouellette Koby, 1990). One approach that has been specifically identified as a promising candidate is that of personal goals (Karoly, 1991; Wiebe & Smith, 1997). Personal goals may be defined as the consciously articulated, personally meaningful objectives that individuals pursue in their daily lives. These goals have been operationalized in terms of personal projects (Little, 1989), life tasks (Cantor, Markus, Niedenthal, & Nurius, 1985), and current concerns (Klinger, 1977; see Cantor & Zirkel, 1990, for details). Personal goals represent self-investments that provide individuals with a sense of purpose and identity, and create a framework for interpreting everyday experience (Brunstein, Dangelmeyer, & Schultheiss, 1996; Lavalle & Campbell, 1995). As such, one's personal goals are likely to be linked to one's quality of functioning and overall well-being, including physical health and illness (Emmons, 1989; Little, 1989). Despite the promise of a personal goal analysis of the personality–illness relationship, relatively little research has been conducted; the following is a review of the published data.

Emmons and King (1988) used two samples to examine whether personal striving conflict and ambivalence were related to physical symptom reports and health center visits. Results indicated that conflict was positively related to symptoms and visits; the data were unclear for ambivalence. In a third sample, Emmons and King (1988) found a positive association between striving rumination and symptom reports. Cantor, Acker, and Cook-Flanagan (1992) failed to replicate the conflict findings of Emmons and King (1988), as their data revealed a null rela-
Avoidance personal goals

Mediation Mechanisms

Research on the personality-illness relationship has been focused predominantly on documenting direct links between personality variables and indicators of illness, with little consideration of the psychological and physiological mechanisms responsible for such relationships (Cohen & Williamson, 1991; Wiebe & Smith, 1997). Noting this oversight, several theorists have argued that the personality-illness literature will remain at a nascent stage of development until these “how” questions are addressed (Krantz & Hedges, 1987; Ouellette Kobasa, 1990). It is only in the past few years that mediational data have begun to appear in the literature in general (Aspinwall & Taylor, 1992; Cohen et al., 1995; Epstein & Katz, 1992; Kemeny, Cohen, Zegans, & Conant, 1989; Strauman, Lemieux, & Coe, 1993), and personal goal researchers have yet to address this question in their work on the personality-illness link. In the present research, two psychological constructs were investigated as mediators of the hypothesized relationship between avoidance personal goals and physical symptomatology: perceived competence and perceived self-determination, which was represented by two variables—perceived autonomy and perceived controlledness (see Deci & Ryan, 1991). Perceived competence refers to the degree to which an individual feels effective or competent in his or her goal pursuits (Brunstein, 1993; Elliot et al., 1997). Perceived autonomy refers to the degree to which goal pursuit is experienced as freely chosen, emerging from one’s core values or inherent interests, whereas perceived controlledness refers to the degree to which goal pursuit is experienced as coerced, or pressured by external forces or intrapsychic demands (Ryan & Connell, 1989; Sheldon & Elliot, 1998).

The focus on negative outcomes or events inherent in avoidance regulation is likely to elicit and sustain threat appraisals, anxiety, and self-protection processes, as the individual is inescapably reminded of aversive possibilities (Elliot & Church, 1997; Elliot & Sheldon, 1997). Research from a variety of literatures (e.g., test anxiety, achievement motivation, intrinsic motivation) has clearly demonstrated that threat, anxiety, and self-protection have deleterious consequences for both the effectiveness of self-regulatory efforts (Covington, 1992; Hembree, 1988) and the phenomenological experience of goal pursuit (Csikszentmihalyi, 1990; Deci & Ryan, 1991). In addition, avoidance regulation is likely to be associated with perceptual, attentional, and mental control processes such as a perceptual-cognitive sensitivity to negative information (Derryberry & Reed, 1994), the heightened accessibility of negative information (Higgins, 1996), and a biased search or “hypothesis test” for the presence of negative information (Wegner, 1994; see also Kunda, 1990) that would also undoubtedly have negative effects on goal attainment and phenomenal experience. As such, avoidance (relative to approach) goals are presumed to be less effective forms of regulation and to produce lower perceptions of competence (Elliot et al., 1997). Furthermore, the pursuit of avoidance goals should have little inherent or intrinsic appeal; it seems more likely that individuals will feel compelled to force or pressure themselves to engage in these phenomenologically aversive forms of regulation (Elliot & Harackiewicz, 1996). Thus, in our research, avoidance personal goals were hypothesized to be negatively related to perceived competence and autonomy and positively related to perceived controlledness. These hypotheses represent

1 Although research on the relationship between avoidance personal goals and symptom reports has yet to be published (i.e., disseminated in a peer-reviewed journal), Emmons and Kaiser (1996) did present relevant data in a recent book chapter. Specifically, using several existing data sets, Emmons and Kaiser coded personal strivings for approach and avoidance and computed the zero-order correlation between the number of avoidance strivings and symptom reports. The results were ambiguous: A positive correlation was obtained in half of the samples considered, and a null relationship was obtained in the others.
the first path in the proposed model linking avoidance personal goals to physical symptom reports.

Competence-relevant constructs such as perceived competence are at the core of most conceptualizations of motivation and health (e.g., self-efficacy theory, the health belief model; see Bandura, 1977; Rosenstock, 1974). Self-determination theorists have recently espoused the need to also attend to constructs such as perceived autonomy and controlledness in the health domain (see Williams, Deci, & Ryan, 1998). Specifically, self-determination theorists contend that both competence and self-determination (i.e., the presence of autonomy and absence of controlledness) represent basic psychological needs, nutrients essential for optimal functioning (Deci & Ryan, 1991; Sheldon, Ryan, & Reis, 1996). Failure to satisfy these fundamental organismic requirements is posited to lead to decrements in physical and psychological well-being (Ryan, 1995), presumably because this lack of “psychological nourishment” produces stress and its inimical physiological concomitants (see Ratliff-Crain & Baum, 1990; Wiebe & Smith, 1997). A substantial amount of empirical work has linked competence and (to a lesser degree) autonomy or controlledness to health-relevant behavior (see Janz & Becker, 1984; Williams et al., 1998); a modicum of studies has linked these variables directly to indicators of physical health and illness (Bandura, Cioffi, Taylor, & Brouillard, 1988; Grow Kasser & Ryan, in press; Williams, Freedman, & Deci, 1996; see also Kasser & Ryan, 1996). In our research, perceived competence and autonomy were predicted to be negatively related, and perceived controlledness positively related, to physical symptom reports. These hypotheses represent the second path in the proposed model linking avoidance personal goals to symptom reports. Perceived competence, perceived autonomy, and perceived controlledness were additionally hypothesized to account for the proposed relationship between avoidance goals and symptoms reports, thereby establishing the former’s status as mediator variables (Judd & Kenny, 1981).

Methodological Considerations

Physical symptom reports are by far the most frequently used dependent measure in research on the personality—illness relationship (Larsen, 1992; Wiebe & Smith, 1997). These measures are popular not only because they are face valid, easy to administer, and “psychometrically elegant” (Davidson & Pennebaker, 1996), but also because symptom perceptions and reports influence health-relevant behavior (e.g., self-medication, medical care utilization; Larsen & Kasimatis, 1991); have implications for daily functioning and self-regulation (e.g., activity level, work absenteeism; Robbins, Spence, & Clark, 1991); are a primary factor in many physician diagnoses (Brown & Moskowitz, 1997); and are, to some degree, accurate indicators of organic condition (Watson & Pennebaker, 1989). Like all measures of illness, however, symptom reports have weaknesses and vulnerabilities that pose methodological challenges for researchers (Davidson & Pennebaker, 1996). Unfortunately, these challenges have often been ignored in the extant research, leaving much of the literature susceptible to criticism.

One important methodological issue concerns the role of neuroticism as a potential nuisance variable in research linking personality measures to symptom reports. Neuroticism may be construed as a broad disposition representing individual differences in autonomic nervous system lability and in the tendency to experience negative affect (H. Eysenck & Eysenck, 1985). Researchers have repeatedly documented a moderate-to-strong correlation between neuroticism (or, alternatively, trait negative affectivity) and symptom reports (Costa & McCrae, 1987; Watson & Pennebaker, 1989). As such, to the extent that a personality measure is associated with neuroticism, any observed relationship between that personality measure and symptom reports could be spurious, simply reflecting the underlying influence of neuroticism. For example, Smith, Pope, Rhodewalt, and Poulton (1989) have shown neuroticism to be a confounding variable in the relationship between optimism and symptom reports, in that the observed association between optimism and symptoms is eliminated when neuroticism is controlled (see also Funk & Houston, 1987; J. Hull, Tedlie, & Lehn, 1995; Rhodewalt & Zone, 1989). For years researchers have been encouraged to measure and statistically control neuroticism in their studies to address this issue (Costa & McCrae, 1987; Holroyd & Coyne, 1987), but few have heeded the call; personal goal researchers have yet to control for neuroticism in their work on the personality—illness relationship (see Emmons & King, 1988, Study 1, for the closest analog). In all three studies of the present research, neuroticism was measured and statistically controlled in testing the relationship between avoidance personal goals and symptom reports. Furthermore, several other personality variables that have also been empirically or theoretically linked to symptom reports (Type A personality, optimism, hope, behavioral inhibition system [BIS] sensitivity, extraversion, and Neuroticism × Extraversion; see Eagleston et al., 1986; Fowles, 1988; Scheier & Carver, 1987; Snyder et al., 1991; Zautra, Finch, Reich, & Guarnaccia, 1991) were also included to more rigorously test the discriminant validity of the avoidance goals construct.

A second important methodological issue concerns the degree to which response tendencies or biases inflate or even create correlations between personality and physical symptom measures. The vast majority of research in this area has examined the link between personality and symptom reports either concurrently or prospectively using a one-time retrospective measure of symptoms (Brown & Moskowitz, 1997; Larsen, 1992). Results from such studies are difficult to interpret because any association observed between personality and symptom measures may simply be an artifact of demand characteristics, self-presentation concerns, or (in concurrent designs) mood or context effects (Costa & McCrae, 1987; Greenberg, Wortman, & Stone, 1996). An optimal way of addressing this issue is to use a longitudinal design in which symptoms are assessed on more than one occasion and prior symptom reports (with their attendant response tendencies and biases) are controlled in statistical analyses. Such designs are highly uncommon in the personality—illness literature (for examples, see Kobasa, Maddi, & Kahn, 1982; Scheier & Carver, 1985) and have yet to be used by personal goal researchers working in this domain. In the present research, we used both longitudinal and retrospective designs.

2 Although any assessment involving recall could technically be labeled retrospective, in practice the term is usually reserved for one-time assessments involving recall over an extended period (typically the length of an entire study; see Elliot & Sheldon, 1997; Larsen, 1992). It is this latter use of the term that we adopted in our research.
Overview of the Present Research

In summary, the present research is composed of three studies that tested, with methodological rigor, the hypothesis that avoidance personal goals are positively related to physical symptom reports and examined the proposition that perceived progress, perceived autonomy, and perceived controlledness are the psychological mechanisms responsible for the hypothesized relationship. In Study 1 we tested the relationship between avoidance goals and symptom reports over a 1-month period using both longitudinal and retrospective methodologies. In Studies 2 and 3 we examined this relationship over the course of an entire semester-long period (4 months); in Study 2 we used a retrospective approach, whereas in Study 3 we used both longitudinal and retrospective methodologies. All three studies tested the relationship between avoidance goals and symptom reports controlling for neuroticism, and each study also included at least two additional "third-variable" candidates. In Studies 2 and 3 we addressed the issue of mediation by assessing participants' perceived competence, perceived autonomy, and perceived controlledness with regard to their goals several times throughout the semester-long period. Path-analytic techniques were used to test the two components of the proposed mediational model: (a) that avoidance goals would predict perceived competence, perceived autonomy, and perceived controlledness and (b) that these process variables would independently predict symptom reports and account for (i.e., explain) the hypothesized relationship between avoidance goals and symptoms. Two ancillary issues were also explored: the degree to which avoidance goals predict specific physical symptoms and the precise roles played by neuroticism and avoidance goals as joint predictors of physical symptomatology.

Study 1

Method

Participants and Overview of Procedure

A total of 82 (46 male and 36 female) university undergraduates in a psychology class participated in the study for extra credit. During the 2nd month of the semester, individuals were contacted by phone and those who chose to participate in the study were asked to generate a list of at least five goals that they would be pursuing during the next month. Participants then brought these candidate goals to an individual session in which they selected their final set of five goals for the study and reported their physical symptoms during the past 2 weeks (baseline symptoms). Approximately 2 weeks later, participants reported their physical symptoms during the past 2 weeks (the first component of an aggregate symptoms measure) and completed indicators of neuroticism, Type A personality, and optimism. After approximately 2 more weeks, participants attended a final individual session in which they again reported their physical symptoms during the past 2 weeks (the second component of the aggregate symptoms measure), completed a physical symptoms measure for the entire study-long period (retrospective symptoms), and were provided with information about the purpose of the research.

Measures

Definition of personal goals and the avoidance goals measure. Personal goals were defined as the "individual, specific goals" that participants would be pursuing during the next month. No other information about personal goals was provided. Two trained individuals independently coded each goal as approach or avoidance (interjudge agreement was 99.76%, with disagreements resolved through discussion). Examples of approach goals listed by participants are "practice recycling more often" and "wake up at 8:30 every morning"; examples of avoidance goals are "not judge new friends" and "eat less fried foods." An avoidance goals index was created for each participant by summing the number of avoidance goals listed in his or her set of five goals. Recent research has demonstrated the validity of this type of measure by linking the adoption of avoidance personal goals to dispositional indicators of avoidance motivation (e.g., projective and self-reported fear of failure) as well as assessments of psychological well-being (Elliot & Sheldon, 1997; Elliot et al., 1997; see also Coats, Janoff-Bulman, & Alpert, 1996).

Individual-differences measures. Neuroticism was assessed with the Neuroticism subscale of Costa and McCrae's (1992) NEO Five Factor Inventory (NEO-FFI). Participants indicated their responses to the 12 items (sample item: "I often feel tense and jittery") on a 1 (strongly disagree) to 5 (strongly agree) scale, and their responses were summed to form a neuroticism index. Type A personality was assessed with the 21-item Jenkins Activity Survey, Form T (Krantz, Glass, & Snyder, 1974). This measure presents respondents with questions or statements (e.g., "How would your spouse [or best friend] rate your general level of activity?") and instructs them to select one of several response alternatives, some of which are presumed to be indicative of Type A behavior (e.g., "Too active, needs to slow down"). The number of times that participants selected a Type A response was summed to form a Type A personality index. The Life Orientation Test—Revised (Scheier, Carver, & Bridges, 1994) was used to assess optimism. Participants indicated their responses to the six Life Orientation Test items (sample item: "In uncertain times, I usually expect the best.") on a 1 (strongly disagree) to 5 (strongly agree) scale, and their responses were summed to form an optimism index.

Physical symptoms measures. All assessments of physical symptoms used a measure designed by Emmons's (1992) comprised of the following symptoms: headaches, coughing or sore throat, shortness of breath, stiff or sore muscles, chest or heart pain, or palpitations, fatigue or dizziness, acne or pimples, stomach ache or pain, and runny or congested nose. This measure is essentially a brief version of the Pennnebaker Inventory of Limbic Languidity (Emmons & King, 1988), which is a well-validated assessment of physical symptoms and sensations (see Peenebaker, 1982), and this nine-item scale itself evidences good validity (e.g., scores are positively related to health center visits for illness; Ryan, 1996). Several of the nine symptoms have been specifically identified as precursors to serious diseases such as ulcers, heart disease, asthma, and arthritis (Friedman & Booth-Kewley, 1987). For the longitudinally based assessments, participants indicated how often they had experienced each of the nine symptoms during the past 2 weeks on a 1 (not at all) to 7 (very frequently) scale. A baseline symptoms measure was created by summing the nine items on the first assessment that referred to the 2 weeks prior to the study; an aggregate symptoms measure was created by summing participants' scores on each of the biweekly assessments and then summing across the two periods. A retrospective symptoms measure was formed by summing the nine items on the final assessment that used the entire study-long period as the temporal referent.

Results

Participant Attrition, Descriptive Statistics, and Gender

All but 1 of the initial 82 participants completed the study, resulting in an attrition rate of 1.2%. Attrition analyses were
not conducted given the absence of variance in the study dropout group. The means, standard deviations, ranges, and reliabilities of the variables for the final sample of 81 (45 male and 36 female) participants are presented in Table 1. Intercorrelations among the primary study variables are presented in Table 2. In all analyses (in this and the remaining studies), we included gender with the other "main effect" predictors in initial multiple regression analyses; gender was retained in subsequent or final analyses only when it was significant.

The Relationship Between Avoidance Goals and Physical Symptoms

Change in physical symptoms. To investigate the relationship between the pursuit of avoidance goals and longitudinal change in physical symptoms, we regressed aggregate symptoms on avoidance goals and baseline symptoms. The regression yielded a significant effect for baseline symptoms, \( F(1, 78) = 57.15, p < .0001, \beta = .63 \). More important, avoidance goals also attained significance, \( F(1, 78) = 5.07, p < .05, \beta = .19 \), indicating that participants pursuing a greater number of avoidance goals evidenced an increase in physical symptoms during the month. Three additional analyses were then conducted in which the regression was repeated with an alternative predictor variable (neuroticism, Type A personality, or optimism) also in the equation. Adding the alternative predictors had a negligible impact on the relationship between avoidance goals and change in physical symptoms: The beta coefficient remained the same (and was significant) in all analyses.

Retrospective physical symptoms. To investigate the relationship between the pursuit of avoidance goals and retrospective physical symptoms, we computed a Pearson product-moment correlation between avoidance goals and retrospective physical symptoms, we computed a Pearson product-moment correlation between avoidance goals and retrospective physical symptoms, we computed a Pearson product-moment correlation between avoidance goals and retrospective physical symptoms, we computed a Pearson product-moment correlation between avoidance goals and retrospective physical symptoms. Although the relationship was not statistically significant \( (r = .16, p = .15) \), a trend was clearly evident in the same direction as the longitudinal result. The same set of "alternative predictor" analyses described earlier was conducted for retrospective symptoms. Adding the alternative predictors had a minimal impact on the observed relationship: The beta coefficient dropped \(.02, .01\), and remained the same with neuroticism, optimism, and Type A personality in the equation, respectively (all \( ps < .19 \)).

Discussion

The results of this study support the hypothesis that the pursuit of avoidance personal goals is linked to physical symptomatology. Avoidance goal adoption at the beginning of the month-long period was positively related to a longitudinal increase in symptom reports during the month. This relationship remained significant when controlling for neuroticism, as well as other alternative predictor variables. The retrospective results also provided support, albeit somewhat weaker, for the hypothesized relationship.

In Study 2 we attempted to conceptually replicate and extend Study 1. The time course of Study 1 was relatively brief (1 month), and therefore, the goals that were generated by participants were short-term or "molecular" forms of regulation. In Study 2 we examined the ramifications of avoidance regulation over the course of a semester-long (4-month) period, thereby affording a test of the generalizability of the Study 1 findings to a more "molar" set of personal goals (see Little, 1989, for a discussion of the molecular-molar distinction). Two additional changes in Study 2 were a sole focus on retrospective symptom reports and the inclusion of different third-variable candidates to supplement neuroticism: extraversion (which also enabled Neuroticism × Extraversion to be tested) and hope. Obtaining significant results in a semester-long study, with a retrospective symptoms measure, and controlling for additional alternative predictors would further attest to the robustness of the relationship between avoidance goals and symptom reports. Most importantly, in Study 2 we addressed the question of mediation. Participants' perceived competence, perceived autonomy, and perceived controlledness with regard to their goals was assessed three times during the semester, and these variables were tested as mediators of the relationship between avoidance goals and symptom reports.

Study 2

Method

Participants and Overview of Procedure

A total of 177 (75 male and 102 female) university undergraduates in a psychology class participated in the study for extra credit. The study was conducted in multiple sessions over the course of a semester-long period. In large group sessions at the beginning of the semester, participants identified 10 personal goals that they would be pursuing during the semester and completed measures of neuroticism, extraversion, and hope. In a series of individual sessions throughout the semester (every 3–4 weeks), participants completed a questionnaire assessing their perceptions of competence, autonomy, and controlledness regarding their goals. In a final individual session at the end of the semester, participants completed a retrospective physical symptoms measure, identified each

<table>
<thead>
<tr>
<th>Variable</th>
<th>( M )</th>
<th>( SD )</th>
<th>Possible range</th>
<th>Observed range</th>
<th>Reliability</th>
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<tr>
<td>Avoidance goals</td>
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<td>0–3</td>
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<td>14.32</td>
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<td>20–80</td>
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<td>Retrospective symptoms</td>
<td>21.10</td>
<td>7.94</td>
<td>9–63</td>
<td>9–50</td>
<td>.85</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>31.88</td>
<td>8.06</td>
<td>12–60</td>
<td>15–55</td>
<td>.71</td>
</tr>
<tr>
<td>Type A personality</td>
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<td>3.66</td>
<td>0–21</td>
<td>2–17</td>
<td>.83</td>
</tr>
<tr>
<td>Optimism</td>
<td>20.59</td>
<td>4.66</td>
<td>6–30</td>
<td>9–30</td>
<td>.83</td>
</tr>
</tbody>
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Note. \( n = 81 \).
of their goals as approach or avoidance, and were provided with information about the purpose of the research.¹

**Measures**

**Definition of personal goals and the avoidance goals measure.** Personal goals were defined as "things that you typically or characteristically are trying to do in your daily life... the purposes or goals that you seek in your everyday behavior" (see Emmons, 1986). Various dimensions of personal goals were described (including approach-avoidance), and participants were encouraged to consider both approach and avoidance goals as they generated their representative list. Examples of approach goals listed by participants are "to be more organized" and "to excel in my workplace"; examples of avoidance goals are "avoid being lonely" and "avoid excessive partying." An avoidance goals index was created for each participant by summing the number of avoidance goals listed in his or her set of 10 goals.

**Individual-differences measures.** The 12-item versions of the Neuroticism and Extraversion subscales from the Eysenck Personality Questionnaire-Revised (S. Eysenck, Eysenck, & Barrett, 1985) were used to assess neuroticism (sample item: "Would you call yourself tense or 'high strung'?") and extraversion (sample item: "Do others think of you as being very lively?"). Participants indicated their response to each item on a yes-no scale, and their yes responses were summed to form the neuroticism and extraversion indexes. Hope was assessed with the Snyder et al. (1991) eight-item hope scale (sample item: "Even when others get discouraged, I know I can find a way to solve the problem"). Participants indicated their response to each item on a 1 (definitely false) to 4 (definitely true) scale, and their responses were summed to form a hope index.

**Process measures.** For each assessment, participants rated how well they were doing at the present time on each goal on a 1 (not at all) to 9 (very) scale. These ratings were averaged across the 10 goals and then averaged across the three assessments to form a perceived competence index. For each assessment, participants also rated the degree to which they felt they were pursuing each goal at the present time for each of four different reasons (see Ryan & Connell, 1989): external ("Because somebody else wants you to or because the situation demands it"), introjected ("Because you would feel ashamed, guilty, or anxious if you didn't"), identified ("Because you really believe that it's an important goal to have"), and intrinsic ("Because of the fun and enjoyment that it provides you"). Participants indicated their ratings on a 1 (not at all) to 9 (completely) scale. Participants' intrinsic ratings were multiplied by 2, added to their identified ratings, averaged across the 10 goals, and then averaged across the three assessments to form a perceived controlledness index. Participants' external ratings were multiplied by 2, added to their introjected ratings, averaged across the 10 goals, and then averaged across the three assessments to form a perceived controlledness index (see Ryan & Connell, 1989, for the rationale for doubling the intrinsic and external scores; see also Sheldon & Elliot, 1998; Sheldon & Kasser, 1995).

**Physical symptoms measure.** Emmons' (1992) physical symptoms measure includes three items from Derogatis and Spencer's (1982) Brief Symptom Inventory. In this study, Emmons' nine-item measure was supplemented with the four remaining items from Derogatis and Spencer's scale (i.e., hot or cold spells, numbness or tingling in parts of your body, nausea or upset stomach, feeling weak in parts of your body; see Derogatis & Spencer, 1982, for validation information) to form a more extensive (and perhaps more reliable) 13-item index. Participants indicated how often they had experienced each of the physical symptoms during the past semester on a 1 (not at all) to 9 (very frequently) scale, and their responses were summed to form a retrospective symptoms index.

**Results**

**Participant Attrition and Descriptive Statistics**

Eleven of the initial 177 participants did not complete the study, resulting in an attrition rate of 6.2%. Attrition analyses revealed no significant differences between the study completion and study dropout groups. The means, standard deviations, ranges, and reliabilities of the variables for the final sample of 71 male and 95 female participants are presented in Table 3. Intercorrelations among the primary study variables are presented in Table 4.

**The Direct Relationship Between Avoidance Goals and Physical Symptoms**

To investigate the relationship between the pursuit of avoidance goals and retrospective physical symptoms, we regressed retrospective symptoms on avoidance goals (and gender). The regression yielded a significant effect for retrospective symptoms, $F(1, 163) = 5.83, p < .05, \beta = .18$, indicating that participants pursuing a greater number of avoidance goals reported experiencing more physical symptoms over the semester-long period. Gender also attained significance, $F(1, 163) = 9.09, p < .005, \beta = .23$, indicating that women reported experiencing more symptoms than men. Two additional analyses were then conducted in which the above analysis was repeated with an alternative predictor variable (hope) or set of variables (neuroticism, extraversion, and Neuroticism × Extraversion) also in

¹ The data for Study 2 were collected in the context of a larger project, and a portion of the data examined in this study were also used by Elliot, Sheldon, and Church (1997) to investigate a conceptually distinct set of issues.

² Explicitly instructing participants to consider both approach and avoidance goals as they generated their representative list had the unintended consequence of prompting them to list individual goals that included both approach and avoidance components. Thus, instead of coding the goals for approach and avoidance ourselves, we had participants classify each of their goals as approach or avoidance by selecting the category that they thought best described the goal ("focus on attaining a positive outcome" vs. "focus on avoiding a negative outcome," respectively). Parenthetically, the variability in the number of avoidance goals adopted by participants across studies was attributable to the differential time course of the studies (i.e., 1 month vs. a semester-long period) and the differential instruction sets employed in the goal elicitation procedures (i.e., whether the approach—avoidance distinction was mentioned in introducing the concept of personal goals).
that women reported more symptoms than men. The direct relation between perceived competence and higher perceptions of controlledness were associated with higher reports of symptoms. Gender also attained significance, $F(1, 163) = 6.27, p < .05, \beta = .18$, indicating that women reported more controlledness than men.

The relationship between avoidance goals and physical symptoms. To test the final link in the mediational model, we conducted a multiple regression analysis in which retrospective symptoms was regressed on perceived competence, perceived autonomy, and perceived controlledness with avoidance goals and gender also in the equation (see Judd & Kenny, 1981, for the steps necessary to document mediation). The relationship between perceived autonomy and retrospective symptoms was not significant; therefore, perceived autonomy was trimmed from the model (Judd & Kenny, 1981). The regression revealed that both perceived competence, $F(1, 161) = 5.20, p < .05, \beta = -.16$, and perceived controlledness, $F(1, 161) = 26.72, p < .0001, \beta = .38$, were significant predictors of retrospective symptoms, indicating that lower perceptions of competence and higher perceptions of controlledness were associated with higher reports of symptoms. Gender also attained significance, $F(1, 160) = 5.54, p < .05, \beta = .16$, indicating that women reported more symptoms than men. The direct relationship between avoidance goals and retrospective symptoms was no longer significant with the mediator variables in the equation ($p > .77$), and the beta coefficient for this relationship dropped from .18 to .02.

### Table 3 Descriptive Statistics for Study 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Possible range</th>
<th>Observed range</th>
<th>Reliability</th>
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</thead>
<tbody>
<tr>
<td>Avoidance goals</td>
<td>2.86</td>
<td>1.60</td>
<td>0–10</td>
<td>0–8</td>
<td>.89</td>
</tr>
<tr>
<td>Retrospective symptoms</td>
<td>24.70</td>
<td>9.34</td>
<td>13–91</td>
<td>13–57</td>
<td>.90</td>
</tr>
<tr>
<td>Perceived competence</td>
<td>5.34</td>
<td>1.18</td>
<td>1–9</td>
<td>2.33–7.97</td>
<td>.92</td>
</tr>
<tr>
<td>Perceived autonomy</td>
<td>16.32</td>
<td>3.60</td>
<td>1–27</td>
<td>8.97–25.40</td>
<td>.95</td>
</tr>
<tr>
<td>Perceived controlledness</td>
<td>10.20</td>
<td>3.47</td>
<td>1–27</td>
<td>3–19.27</td>
<td>.95</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>5.16</td>
<td>3.43</td>
<td>0–12</td>
<td>0–12</td>
<td>.87</td>
</tr>
<tr>
<td>Extraversion</td>
<td>8.50</td>
<td>3.44</td>
<td>0–12</td>
<td>0–12</td>
<td>.83</td>
</tr>
<tr>
<td>Hope</td>
<td>25.60</td>
<td>3.36</td>
<td>8–32</td>
<td>15–32</td>
<td>.82</td>
</tr>
</tbody>
</table>

Note. $n = 166$.

### Mediation

The relationship between avoidance goals and the process variables. Pearson correlations were computed to determine the relationship between avoidance goals and both perceived competence and perceived autonomy; a multiple regression analysis was conducted with perceived controlledness (to include gender). Both correlation coefficients were significant, indicating that participants pursuing a greater number of avoidance goals reported lower perceptions of competence ($r = -.19, p < .05$) and autonomy ($r = -.27, p < .0005$) during the semester. The regression analysis revealed a significant relationship between avoidance goals and perceived controlledness, $F(1, 163) = 21.72, p < .0001, \beta = .34$, indicating that participants pursuing a greater number of avoidance goals reported more controlledness during the semester. Gender also attained significance, $F(1, 163) = 6.27, p < .05, \beta = .18$, indicating that women reported more controlledness than men.

The relationship between the process measures and physical symptoms. To test the final link in the mediational model, we conducted a multiple regression analysis in which retrospective symptoms was regressed on perceived competence, perceived autonomy, and perceived controlledness with avoidance goals (and gender) also in the equation (see Judd & Kenny, 1981, for the steps necessary to document mediation). The relationship between perceived autonomy and retrospective symptoms was not significant; therefore, perceived autonomy was trimmed from the model (Judd & Kenny, 1981). The regression revealed that both perceived competence, $F(1, 161) = 5.20, p < .05, \beta = -.16$, and perceived controlledness, $F(1, 161) = 26.72, p < .0001, \beta = .38$, were significant predictors of retrospective symptoms, indicating that lower perceptions of competence and higher perceptions of controlledness were associated with higher reports of symptoms. Gender also attained significance, $F(1, 160) = 5.54, p < .05, \beta = .16$, indicating that women reported more symptoms than men. The direct relationship between avoidance goals and retrospective symptoms was no longer significant with the mediator variables in the equation ($p > .77$), and the beta coefficient for this relationship dropped from .18 to .02.

**Structural equation modeling analyses.** Structural equation modeling (SEM) was used to test the paths in the hypothesized mediational model simultaneously and to assess the fit of the model to the observed data. Conceptually peripheral but significant relationships such as that between gender and retrospective symptoms were also incorporated into the model. The correlation matrix was used as input, and LISREL VIII (Jöreskog & Sörbom, 1990) generated standardized parameter estimates based on maximum-likelihood estimation. Each latent variable was represented by a single observed indicator. Following Hoyle and Panter's (1995) recommendation, both absolute (goodness-of-fit index [GFI] and adjusted goodness-of-fit index [AGFI]) and incremental (comparative fit index [CFI] and incremental fit index [IFI]) indexes were used to evaluate the fit of the model to the data. The standardized parameter estimates obtained in the analysis were essentially identical to (within .01 standardized unit of) those obtained with the regression procedures. In addition, the analysis revealed that the model provided a satisfactory fit to the data, $\chi^2(7, N = 166) = 13.77, p > .05$; GFI = .97, AGFI = .92, CFI = .93, and IFI = .93. Each of these values is in the range generally interpreted as being representative of a good-fitting model (see Tanaka, 1987). Repeating this SEM analysis and including an alternative predictor variable (hope) or set of variables (neuroticism and extraversion) and their significant or marginally significant paths (as evidenced in regression analyses) yielded highly comparable results. Each of the hypothesized relationships remained $p < .05$, except the avoidance goals to perceived competence path controlling for hope ($p < .07$) and the perceived competence to retrospective symptoms path ($p < .17$) controlling for neurot-
The longitudinal symptom variables was changed from "the past (Brown & Moskowitz, 1997; Larsen, 1992) and that concurrent between these two forms of potential bias. Second, only two days as a temporal referent was deemed an optimal balance symptom reports can be affected by context-specific variables demonstrated that recall-based symptom reports can be subject to memorial biases that increase with length of time frame "2 weeks" in Study 1 to "the past few days." Research has the previous studies should be noted. First, the time frame for results obtained in Study 1 would replicate. Three changes from the control variables. A series of analyses validated perceived competence and perceived controlledness as mediators of the relationship between avoidance goals and retrospective symptoms (see Figure 1 for a pictorial summary of the primary results).

Discussion

The results of this study conceptually replicated and extended those obtained in Study 1. Avoidance goal adoption at the beginning of the semester was positively related to retrospective reports of physical symptoms experienced during the semester. This relationship remained significant or marginally significant when controlling for neuroticism or the other alternative predictor variables. A series of analyses validated perceived competence and perceived controlledness as mediators of the observed relationship, as avoidance goals predicted perceived competence and controlledness and these variables, in turn, predicted symptom reports. Interestingly, it was the (perceived) presence of controlledness and not the absence of autonomy that was the operative self-determination mediator; avoidance goals predicted perceived autonomy, but perceived autonomy did not predict symptoms.

In Study 3 we sought to simultaneously (conceptually) replicate Studies 1 and 2. The study was conducted over a semester-long period, both longitudinal and retrospective methodologies were employed, and perceived competence and perceived controlledness were tested as mediators of the anticipated longitudinal and retrospective relationships. Perceived autonomy was also examined as a mediator variable to determine whether the null results obtained in Study 1 would replicate. Three changes from the previous studies should be noted. First, the time frame for the longitudinal symptom variables was changed from “the past 2 weeks” in Study 1 to “the past few days.” Research has demonstrated that recall-based symptom reports can be subject to memorial biases that increase with length of time frame (Brown & Moskowitz, 1997; Larsen, 1992) and that concurrent symptom reports can be affected by context-specific variables such as mood (Salovey & Birnbaum, 1989). Using the past few days as a temporal referent was deemed an optimal balance between these two forms of potential bias. Second, only two symptom assessments were employed in the longitudinal aspect of the study, one at the beginning of the semester (Time 1 [T1]) and one at the end of the semester (Time 2 [T2]). This change, in conjunction with the first, enabled an appropriate test of the mediational hypotheses with the longitudinal and retrospective data (see Kenny, 1979). Third, BIS sensitivity replaced the hope variable in Study 2 as an alternative predictor variable.

Study 3

Method

Participants and Overview of Procedure

A total of 159 (59 male and 100 female) university undergraduates in a psychology class participated in the study for extra credit. The study was conducted in a series of sessions over the course of a semester-long period. In group sessions at the beginning of the semester, participants identified eight personal goals that they would be pursuing during the semester, completed a T1 physical symptoms measure, designated each of their goals as approach or avoidance, and completed measures of neuroticism, extraversion, and BIS sensitivity. In several individual sessions throughout the semester (every 4 weeks), participants completed a questionnaire assessing their perceptions of competence, autonomy, and controlledness regarding their goals. In a final individual session at the end of the semester, participants completed a T2 physical symptoms measure, filled out a retrospective physical symptoms measure, and were given an explanation of the purpose of the study.

Measures

Definition of personal goals and the avoidance goals measure. Personal goals were defined as “things that you typically or characteristically are trying to do in your daily life.” Various dimensions of personal goals were described (including approach—avoidance), and participants were instructed to select “the eight personal goals that you think best describe what you will typically be trying to do in your daily life during this semester.” Two trained individuals independently coded each goal as approach or avoidance (interjudge agreement was 99.8%, with disagreements resolved through discussion). Examples of approach goals listed by participants are “get in good shape” and “be more gentle and humble”; examples of avoidance goals are “avoid procrastination” and “not be as lazy.” An avoidance goals index was created for each participant by summing the number of avoidance goals listed in his or her set of eight goals (given their high intercorrelation, \( r = .95 \), the participant and coder judgments were combined in creating this measure).

Individual-differences measures. As in Study 1, neuroticism was assessed with the Neuroticism subscale of Costa and McCrae’s (1992) NEO-FFI; extraversion was assessed with the Extraversion subscale of the NEO-FFI (sample item: “I am a cheerful, high-spirited person”).

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Avoidance goals</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Retrospective physical symptoms</td>
<td>.19*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Perceived competence</td>
<td>— .22**</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Perceived autonomy</td>
<td>— .28** .08</td>
<td>28**</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Perceived controlledness</td>
<td>.36** .45** —17* — .06</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Neuroticism</td>
<td>.18* .38** —.36** —22** .34**</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. \( n = 166 \).

* \( p < .05 \). ** \( p < .01 \).
Participants indicated their responses to the 12 items on each measure using a 1 (strongly disagree) to 5 (strongly agree) scale and their responses were summed to form the neuroticism and extraversion indexes. BIS sensitivity was assessed with Carver and White’s (1994) seven-item BIS scale (sample item: “I worry about making mistakes”). Participants indicated their response to each item on a 1 (strongly disagree) to 4 (strongly agree) scale, and their responses were summed to form the BIS index.

Process measures. The same process measures used in Study 2 were used in this study.

Physical symptoms measures. The same physical symptoms measure used in Study 2 was used in this study to assess symptoms at T1, T2, and retrospectively. For the T1 and T2 measures, participants indicated how often they had experienced each of the symptoms during the past few days. For the retrospective measure, participants indicated how often they had experienced each of the symptoms during the semester.

Results

Participant Attrition and Descriptive Statistics

Six of the initial 159 participants did not complete the study, resulting in an attrition rate of 3.8%. Attrition analyses revealed no significant differences between the study completion and study dropout groups. Three additional participants were excluded from analyses because of missing data. The means, standard deviations, ranges, and reliabilities of the variables for the final sample of 56 male and 94 female participants are presented in Table 5. Intercorrelations among the primary study variables are presented in Table 6.

Table 5
Descriptive Statistics for Study 3

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Possible range</th>
<th>Observed range</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoidance goals</td>
<td>1.43</td>
<td>1.26</td>
<td>0–8</td>
<td>0–6</td>
<td>.86</td>
</tr>
<tr>
<td>T1 symptoms</td>
<td>27.67</td>
<td>11.33</td>
<td>13–91</td>
<td>13–59</td>
<td>.82</td>
</tr>
<tr>
<td>T2 symptoms</td>
<td>30.10</td>
<td>13.35</td>
<td>13–91</td>
<td>13–72</td>
<td>.85</td>
</tr>
<tr>
<td>Retrospective symptoms</td>
<td>32.41</td>
<td>11.95</td>
<td>13–91</td>
<td>13–64</td>
<td>.89</td>
</tr>
<tr>
<td>Perceived competence</td>
<td>5.44</td>
<td>1.24</td>
<td>1–9</td>
<td>1.79–7.96</td>
<td>.90</td>
</tr>
<tr>
<td>Perceived autonomy</td>
<td>16.60</td>
<td>3.43</td>
<td>1–27</td>
<td>7.38–25.83</td>
<td>.90</td>
</tr>
<tr>
<td>Perceived controlledness</td>
<td>10.71</td>
<td>3.63</td>
<td>1–27</td>
<td>3.17–22.92</td>
<td>.94</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>35.59</td>
<td>8.49</td>
<td>12–60</td>
<td>15–58</td>
<td>.86</td>
</tr>
<tr>
<td>Extraversion</td>
<td>42.07</td>
<td>6.68</td>
<td>12–60</td>
<td>23–56</td>
<td>.81</td>
</tr>
<tr>
<td>BIS</td>
<td>21.50</td>
<td>3.56</td>
<td>7–28</td>
<td>7–28</td>
<td>.78</td>
</tr>
</tbody>
</table>

Note. n = 81. T1 = Time 1; T2 = Time 2; BIS = behavioral inhibition system.
long period. Gender also attained significance, $F(1, 147) = 6.63$, $p < .05$, $\beta = .21$, indicating that women reported experiencing more symptoms than men. The same set of alternative predictor analyses described earlier were conducted for retrospective symptoms. Adding the alternative predictors had a negligible effect on the relationship between avoidance goals and retrospective symptoms: With neuroticism, extraversion, and Neuroticism $\times$ Extraversion in the equation, the beta coefficient remained the same, whereas with BIS in the equation, the coefficient increased .01 standardized unit (both betas remained significant).

Mediation

The relationship between avoidance goals and the process variables. Pearson correlations were computed to determine the relationships among avoidance goals and perceived competence, perceived autonomy, and perceived controlledness. All three correlation coefficients were significant. Participants pursuing a greater number of avoidance goals reported lower perceptions of progress ($r = -.29, p < .0005$), lower perceptions of autonomy ($r = -.27, p < .001$), and higher perceptions of controlledness ($r = .23, p < .01$) during the semester.

The relationship between the process measures and change in physical symptoms. To test the final link in the mediational model for change in physical symptoms, we conducted a multiple regression analysis in which T2 symptoms was regressed on perceived competence, perceived autonomy, and perceived controlledness with T1 symptoms and avoidance goals (and gender) also in the equation. The relationship between perceived autonomy and T2 symptoms was not significant; therefore, perceived autonomy was trimmed from the final model. The regression yielded a significant effect for T1 symptoms, $F(1, 144) = 37.45$, $p < .0001$, $\beta = .43$. More important, perceived competence, $F(1, 144) = 4.81$, $p < .05$, $\beta = -.16$, and perceived controlledness, $F(1, 144) = 6.15$, $p < .05$, $\beta = .18$, were also significant predictors of T2 symptoms, indicating that lower perceptions of competence and higher perceptions of controlledness were associated with an increase in symptoms. Gender also attained significance, $F(1, 144) = 6.71$, $p < .05$, $\beta = .18$, indicating that women evidenced a greater increase in symptoms than men. The direct relationship between avoidance goals and T2 symptoms was no longer significant with the mediator variables in the equation ($p > .40$), and the beta coefficient for this relationship dropped from .17 to .06.

SEM analyses of the mediational model for change in physical symptoms. SEM was used to test the paths in the hypothesized mediational model simultaneously and to assess the fit of the model to the observed data (see Study 2 for details on the SEM procedures). The standardized parameter estimates obtained in this analysis were essentially identical to (within .01 standardized unit of) those obtained with the regression procedures. In addition, the analysis revealed that the model provided a satisfactory fit to the data, $\chi^2(8, N = 150) = 13.65, p > .05$; GFI = .97, AGFI = .91, CFI = .95, and IFI = .96. Repeating this SEM analysis and including an alternative predictor variable (BIS) or set of variables (neuroticism and extraversion) and their significant or marginally significant paths (as evidenced in regression analyses) yielded the same results. Each of the hypothesized relationships remained $p < .05$, and all goodness-of-fit statistics in both analyses indicated that the model provided a satisfactory fit to the data. In summary, the results from both the regression and SEM analyses clearly established perceived competence and perceived controlledness as mediators of the relationship between avoidance goals and change in physical symptoms.

The relationship between the process measures and retrospective physical symptoms. To test the final link in the mediational model for retrospective physical symptoms, we conducted a multiple regression analysis in which retrospective symptoms was regressed on perceived competence, perceived autonomy, and perceived controlledness with avoidance goals (and gender) also in the equation. The relationship between perceived autonomy and retrospective symptoms was not significant; therefore, perceived autonomy was trimmed from the final model. The regression revealed that both perceived competence, $F(1, 145) = 10.19, p < .005$, $\beta = -.25$, and perceived controlledness, $F(1, 145) = 8.59, p < .005, \beta = .23$, were significant predictors of retrospective symptoms, indicating that lower perceptions of competence and higher perceptions of controlledness were associated with higher reports of symptoms. Gender also attained significance, $F(1, 145) = 11.35, p < .005, \beta = .26$, indicating that women reported more symptoms than men. The direct relationship between avoidance goals and retrospective symptoms was no longer significant with the mediator variables in the equation ($p > .74$), and the beta coefficient for this relationship dropped from .16 to .03.

SEM analyses of the mediational model for retrospective physical symptoms. As with the longitudinally based measures, we also conducted an SEM analysis, and the standardized parameter estimates obtained in this analysis were essentially identical to (within .01 standardized unit of) those obtained with the regression procedures. In addition, the analysis revealed that the model provided a satisfactory fit to the data, $\chi^2(8, N = 150) = 12.74, p > .05$; GFI = .97, AGFI = .92, CFI = .93, and IFI = .94. Repeating this SEM analysis and including an alternative predictor variable (BIS) or set of variables (neuroticism and extraversion) and their significant or marginally significant paths (as evidenced in regression analyses) yielded the same results. Each of the hypothesized relationships remained $p < .05$, and all goodness-of-fit statistics in both analyses indicated that the model provided a satisfactory fit to the data. In summary, the results from both the regression and SEM analyses clearly established perceived competence and perceived controlledness as mediators of the relationship between avoidance goals and retrospective symptoms (see Figure 2 for a pictorial summary of the primary results).

Discussion

The results of this study conceptually replicate Studies 1 and 2. Avoidance goal pursuit was positively related to a longitudinal
increase in physical symptom reports from the beginning to the end of the semester. This relationship remained significant when controlling for neuroticism, as well as the other alternative predictor variables. The same results were obtained with the retrospective indicator of symptoms. The mediational results documented in Study 2 were again obtained in this study. Avoidance goals predicted perceived competence and controlledness and these variables, in turn, predicted longitudinal and retrospective symptom reports. Avoidance goals were negatively related to perceived autonomy, but this variable was not a significant predictor of symptoms.

Meta-Analyses of Studies 1, 2, and 3

Primary Issues

To determine the robustness of the hypothesized relationships, we combined results from the three studies meta-analytically with the Stouffer method (Rosenthal, 1978). In conducting these analyses, we averaged the longitudinal and retrospective results from Studies 1 and 3 to maintain the orthogonality of each contributing data point. As shown in Table 7, each of the hypothesized relationships proved highly robust when combined across studies.

Ancillary Issues

The Stouffer method was also used to explore two ancillary issues: the relationship between avoidance goals and specific symptoms and the precise roles played by neuroticism and avoidance goals as joint predictors of physical symptomatology. Results from the specific symptom analyses clearly attest to the pervasiveness of the inimical impact of avoidance goal pursuit. As shown in Table 7, avoidance goals were significantly positively related to 10 of the 13 symptom variables and the other three relationships displayed a comparable trend.

Our research has established avoidance goals as predictors of physical symptom reports, and previous researchers have linked neuroticism to both avoidance goal adoption (Elliot et al., 1997) and symptom reports (Costa & McCrae, 1987; Watson & Pennebaker, 1989). Considered together, these findings suggest two possibilities regarding neuroticism and avoidance goals as predictors of symptoms: (a) Neuroticism prompts the adoption of avoidance goals and then both variables independently predict symptoms or (b) neuroticism prompts the adoption of avoidance goals, which then serve as mediators of the relationship between neuroticism and symptoms. Our data afforded a test of these possibilities, and results from across the three studies provide support primarily for the first model. Congruent with previous research, neuroticism was a significant predictor of both avoidance goals (z = 2.77, p < .006) and symptom reports (z = 5.86, p < .00001). When considered as simultaneous predictors of symptoms, both neuroticism (z = 4.91, p < .00001) and avoidance goals (see above results) were significant and the relationship between neuroticism and symptoms decreased by .02 standardized units on average, indicating that avoidance goals only mediated a small portion of this relationship.

Figure 2. The mediational model for change in symptoms and retrospective symptoms. Path values are standardized regression coefficients and only theoretically central relationships are included in the diagram for presentation clarity. *p < .05. **p < .01.
AVOIDANCE PERSONAL GOALS

Table 7

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Meta-analytic result (z)</th>
<th>p (two-tailed)</th>
<th>No. of studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoidance goals → Δ physical symptoms</td>
<td>3.34</td>
<td>&lt;.0009</td>
<td>2</td>
</tr>
<tr>
<td>Avoidance goals → retrospective physical symptoms</td>
<td>3.37</td>
<td>&lt;.0008</td>
<td>3</td>
</tr>
<tr>
<td>Avoidance goals → physical symptoms</td>
<td>3.69</td>
<td>&lt;.0003</td>
<td>3</td>
</tr>
<tr>
<td>Acne or pimples</td>
<td>1.24</td>
<td>&lt;.22</td>
<td>3</td>
</tr>
<tr>
<td>Chest or heart pain</td>
<td>2.35</td>
<td>&lt;.019</td>
<td>3</td>
</tr>
<tr>
<td>Coughing or sore throat</td>
<td>2.47</td>
<td>&lt;.014</td>
<td>3</td>
</tr>
<tr>
<td>Faintness or dizziness</td>
<td>1.99</td>
<td>&lt;.047</td>
<td>3</td>
</tr>
<tr>
<td>Feeling weak in parts of your body</td>
<td>1.38</td>
<td>&lt;.17</td>
<td>2</td>
</tr>
<tr>
<td>Headaches</td>
<td>3.19</td>
<td>&lt;.002</td>
<td>3</td>
</tr>
<tr>
<td>Hot or cold spells</td>
<td>2.70</td>
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<td>2</td>
</tr>
<tr>
<td>Nausea or upset stomach</td>
<td>2.56</td>
<td>&lt;.011</td>
<td>2</td>
</tr>
<tr>
<td>Numbness or tingling in parts of your body</td>
<td>2.14</td>
<td>&lt;.033</td>
<td>2</td>
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<td>Runny or congested nose</td>
<td>2.04</td>
<td>&lt;.042</td>
<td>3</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>2.18</td>
<td>&lt;.030</td>
<td>3</td>
</tr>
<tr>
<td>Stiff or sore muscles</td>
<td>1.60</td>
<td>&lt;.11</td>
<td>3</td>
</tr>
<tr>
<td>Stomach ache or pain</td>
<td>2.75</td>
<td>&lt;.007</td>
<td>3</td>
</tr>
<tr>
<td>Avoidance goals → Δ physical symptoms (controlling for neuroticism)</td>
<td>3.12</td>
<td>&lt;.002</td>
<td>2</td>
</tr>
<tr>
<td>Avoidance goals → retrospective physical symptoms (controlling for neuroticism)</td>
<td>2.99</td>
<td>&lt;.003</td>
<td>3</td>
</tr>
<tr>
<td>Avoidance goals → physical symptoms (controlling for neuroticism)</td>
<td>3.28</td>
<td>&lt;.002</td>
<td>3</td>
</tr>
<tr>
<td>Avoidance goals → perceived competence</td>
<td>-4.28</td>
<td>&lt;.00001</td>
<td>2</td>
</tr>
<tr>
<td>Avoidance goals → perceived autonomy</td>
<td>-4.92</td>
<td>&lt;.00001</td>
<td>2</td>
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<tr>
<td>Avoidance goals → perceived controlledness</td>
<td>4.80</td>
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<td>-3.21</td>
<td>&lt;.002</td>
<td>2</td>
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<tr>
<td>Perceived autonomy → physical symptoms</td>
<td>-0.98</td>
<td>&gt;.32</td>
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<tr>
<td>Perceived controlledness → physical symptoms</td>
<td>4.76</td>
<td>&lt;.00001</td>
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<tr>
<td>Avoidance goals → physical symptoms (controlling for mediators)</td>
<td>0.60</td>
<td>&gt;.54</td>
<td>2</td>
</tr>
</tbody>
</table>

Note. The z values were obtained with the Stouffer method. The term physical symptoms indicates a combination of longitudinal and retrospective measures.

General Discussion

In three studies we investigated the hypothesis that avoidance personal goals are positively related to physical symptom reports. In two of these studies we also tested a process model that posited perceived competence and perceived self-determination as mediators of the hypothesized relationship. The results provide clear and strong support for both the direct and mediational hypotheses. Avoidance goals predicted symptom reports in each of the three studies, and across studies, this relationship was documented (a) using both longitudinal (Studies 1 and 3) and retrospective (Studies 1–3) methodologies; (b) with two types of longitudinal designs, one emphasizing full coverage of the study-long period (Study 1) and the other sampling brief time periods at the beginning and end of the study (Study 3); (c) over two temporal periods—1 month (Study 1) and a 4-month semester (Studies 2 and 3)—that presumably evoked different levels of goals (molecular and molar, respectively); and (d) controlling for neuroticism and several additional third-variable candidates. In both studies in which the hypothesized process model was tested, perceived competence and perceived controlledness were validated as mediators of the observed relationship. These mediational processes were documented in the context of both longitudinal and retrospective methodologies, with SEM as well as multiple regression procedures, and both with and without controlling for neuroticism and other alternative predictor variables.

Davidson and Pennebaker (1996) have delineated three different categories of illness indicators: self-report measures (e.g., symptom reports); biological measures (e.g., objective evidence of a cold or upper respiratory infection); and behavioral measures (e.g., absenteeism, physician visits). Each of these categories, which are typically at least moderately intercorrelated (Brown & Moskowitz, 1997; Pennebaker, 1982), is considered by Davidson and Pennebaker (1996) to be a "valid and powerful reflection of illness" (p. 107), but each is also presumed to have distinct weaknesses that require careful methodological attention in empirical work. In the present research, we focused exclusively on the self-report category and attempted to design studies that carefully addressed the methodological challenges posed by this particular class of measure. As such, in Studies 1 and 3 we examined the relationship between avoidance goals and symptom reports while simultaneously controlling for baseline levels of symptom reports and the primary nuisance variable identified in the personality-illness literature: neuroticism. Symptom report research has been (justifiably) critiqued as lacking in methodological rigor and sophistication (Wiebe & Smith, 1997), and we strongly recommend that researchers implement these or comparably rigorous procedures (see Brown & Moskowitz, 1997; Larsen, 1992) when conducting empirical
investigations involving symptom reports or any other self-report measure of illness.

Although the methodological rigor of our studies makes it tempting to conclude that avoidance goal pursuit predicts actual physical illness, the degree to which the symptom outcome measures reflected true organically based variance is not known with certainty. Definitive conclusions about organic condition require the use of biological measures, but we did not use such assessments in our research. Another issue that we did not address was the relationship between the pursuit of avoidance goals and illness-related behaviors. Future empirical work is needed to examine the link between avoidance goals and these additional indicators of illness, attending to the unique methodological challenges presented by each class of measure (see Davidson & Pennebaker, 1996; Larsen & Kasimatis, 1991; Maddi, Bartone, & Pucetti, 1987). One intriguing possibility for future research is to investigate symptom perceptions and reports as a mediator of the relationship between avoidance goals and illness-related behaviors such as physician visits. Our research demonstrated that avoidance goal adoption leads to symptom perceptions and reports, and clearly symptom perception is a prerequisite to proceeding to a physician’s office for medical attention. From this perspective, avoidance goals represent distal predictors of health care utilization, and avoidance goal adoption would appear to have highly pragmatic implications for the health care system regardless of whether it is to actual organically based pathology or mere somatization (see Karoly & Lecci, 1993; Larsen, 1992).

Our research demonstrates that avoidance (relative to approach) goal pursuit has negative implications for physical health, but it does not necessarily follow that all types of avoidance goals are inimical or that all types of approach goals are optimal. To the extent that avoidance goals are linked to concrete, approach-oriented subgoals, they may prove somewhat adequate forms of regulation, and avoidance goals focused on actively eradicating an existing negative situation may be less deleterious than those that involve passive rumination about a future undesirable possibility. Likewise, approach goals may be divided into different categories such as extrinsic and intrinsic (Kasser & Ryan, 1996), performance and learning based (Dweck, 1986), and state and action oriented (Kuhl, 1984), and it is possible that extrinsic, performance-based, and state-oriented forms of approach regulation have a negative impact on physical health. Note that if any of these speculations are accurate, our research represents a conservative test of the relationship between avoidance goals and symptoms because avoidance and approach goals were conceptualized and operationalized in an undifferentiated manner.

A central aspect of our research, and one that is typically neglected in empirical work in the personality–illness literature, was the documentation of mediation. As predicted, perceived competence and perceived self-determination were the psychologically based mediational mechanisms responsible for the relationship between avoidance goals and physical symptomatology. Interestingly, the self-determination data indicated that the presence of controlledness undermined physical health, not that the presence of autonomy served as a prophylactic. This enhanced predictive utility of controlledness relative to autonomy is congruent with recent work by David, Green, Martin, and Suls (1997), who documented the greater utility of negatively versus positively valenced constructs in predicting negative well-being outcomes.

The simultaneous validation of perceived competence and perceived controlledness as “joint mediators” in the present studies is noteworthy for two reasons: First, joint mediational models represent unexplored territory in the personality–illness literature (and are quite rare in goal and self-regulation research more generally; for examples, see Elliot & Harackiewicz, 1994; Sansone, 1986). Second, most contemporary accounts of motivation are grounded in competence and either ignore the self-determination construct or denigrate it as conceptually vacuous (see Bandura, 1989). The present data, however, indicate that perceptions of competence and self-determination have significant and independent influences on physical health. Congruent with the modal conceptualization of motivation, perceived competence was linked to a decrease in symptom reports regardless of perceived controlledness, but, importantly, the data also linked perceived controlledness to an increase in symptom reports regardless of perceived competence. Thus, it appears that competence and self-determination account for unique variance in the health domain, suggesting that a thorough, process-oriented analysis of the personality–illness relationship will need to include both of these variables. Of course, other mediational variables also warrant consideration in subsequent research on avoidance goals and illness, and the personality–illness relationship more generally. Promising candidates include additional psychologically based variables such as subjective stress (see Glaser et al., 1993) as well as more objective, physiologically based variables such as natural killer cell activity (see Strauman et al., 1993), immunoglobulin A concentration (see McClelland, Alexander, & Marks, 1982), and cortisol level (see Cohen-Cole et al., 1981). We assume that variables of this nature serve the role of proximal mediator of the relationship between avoidance goals and physical symptomatology, accounting for the link between perceived competence and controlledness and symptoms documented in our research.

The mediational results obtained in this research fit nicely with self-determination theory’s portrayal of competence and self-determination as fundamental psychological needs (Deci & Ryan, 1991). Competence and self-determination indeed appeared to function as essential requirements for well-being, as individuals who felt incompetent or controlled in their goal pursuits evidenced an increase in physical symptomatology. In light of these data, avoidance goals must be considered a psychological vulnerability because they place individuals at risk of not receiving the basic psychological nutrients necessary for physical health (Ryan, 1995). Personal goals represent, in essence, the vehicles through which individuals negotiate their daily lives, and these data suggest that some vehicles (approach goals) are better suited for the terrain of everyday life than others (avoidance goals). Parenthetically, we should note that personal goals, by their very nature as idiographic self-regulatory vehicles, are not amenable to experimental manipulation. Therefore, despite the rigor of the methodological procedures and data-analytic techniques employed in this research, the direct and mediational results are correlational in nature and definitive causal statements are not warranted.}

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8 This statement is most relevant to the mediational results because the nature of the independent variable (avoidance goals adopted at the
From a broader perspective, our research illustrates the utility of a personal goals approach to the personality–illness relationship. We contend that the personal goals approach holds great promise for the personality–illness literature, in that it possesses attributes that are distinct from, and nicely complement, those of the disposition and coping strategy constructs that dominate the contemporary scene. For instance, relative to dispositional constructs, personal goals are more idiographic (Emmons, 1989); more dynamic (representing the "doing" as opposed to the "having" aspect of personality; Cantor, 1990); and, some might argue, better equipped to explain the "having" aspect of personality; Cantor, 1990); more diagnostically sensitive to the data).

Compared with coping strategies, personal goals are more idiographic (Coyne & Gottlieb, 1996; cf. Aspinwall & Taylor, 1997); focus on positive as well as stressful outcomes and events (see Lazarus & Folkman, 1984); represent anticipatory, proactive strategies rather than post hoc, reactive strategies (Coyne & Gottlieb, 1996); and are more amenable to the broad, representative sampling of self-regulatory experience (i.e., personal goal assessments commonly include 8–10 goals, whereas coping assessments often involve reactions to a single stressful event; Suls et al., 1996). It is interesting to note that the approach–avoidance distinction (or its conceptual equivalent) occupies a prominent place in all three of the approaches under consideration. Several dispositional theorists distinguish between broad appetitive, approach-based (behavioral activation system, extraversion, positive affectivity) and aversive, avoidance-based (BIS; neuroticism, negative affectivity) regulatory or experiential systems (Gray, 1987; Tellegen, 1985; Watson & Clark, 1984); some coping frameworks explicitly utilize the approach–avoidance distinction, and most structural analyses of coping yield an avoidance-based factor (Billings & Moos, 1981; see Suls et al., 1996); and, of course, our research highlights the need to attend to the approach–avoidance distinction with regard to personal goals.

It is important to bear in mind that the aim of personality–illness research is not simply to develop a taxonomy of constructs or a laundry list of variables within each type of construct but to formulate overarching, integrative models of the personality–illness relationship. Nearly all of the research in the personality–illness/well-being literature, and the personality–well-being literature more generally, has been conducted "within construct," and it is only in the past few years that attempts have been made to forge links between constructs. Specifically, researchers have begun to examine dispositions and coping strategies as joint predictors of illness/well-being outcomes, and results to date seem to have revealed that (a) dispositions lead to coping strategies and (b) coping strategies, in turn, predict illness/well-being outcomes and sometimes mediate the direct effects of dispositions (Aspinwall & Taylor, 1992; Bolger, 1990; Bolger & Zuckerman, 1995; Carver et al., 1993; Florian, Mikulincer, & Taubman, 1995; Holahan & Moos, 1990; Scheier et al., 1989; Stanton & Snider, 1993). The inclusion of neuroticism in the present studies enabled us to examine, in ancillary analyses, a different type of integrative link: that between dispositions and personal goals. Results indicated that neuroticism led to avoidance goal adoption and that avoidance goals in turn predicted symptom reports. Neuroticism remained a significant predictor of symptoms (avoidance goals mediated only a small portion of the direct effect), suggesting the need to identify an additional mediator variable, that N is simply associated with certain forms of "pathophysiologic" activity that leads directly to illness, or both (Wiebe & Smith, 1997).

Putting the disposition-personal goal and disposition-coping strategy research together suggests a framework of the type presented in Figure 3a. In this integrative model, global nomothetic dispositions proactively recruit specific idiographic personal goals and influence the coping strategies adopted in response to specific stressful events. These personal goals and coping strategies in turn influence illness/well-being outcomes. Some dispositions, particularly those like neuroticism and extraversion or BIS and behavioral activation system that are presumably undergirded by neuroanatomical substrates (H. Eysenck, 1967; Gray, 1987), are likely to maintain a direct unmediated relationship with illness/well-being outcomes. Figure 3b shows a different variant of the integrative model, one that incorporates the possibility that personal goals predict the coping strategies that are implemented in response to stressful events. Of course, other variants of integrative model are possible (e.g., personal goals may completely mediate the direct relationship between dispositions and coping strategies); there are other complexities that pose additional conceptual challenges (e.g., dispositions, personal goals, or both may influence the degree to which stressful events are encountered, and, therefore, coping strategies are necessary; see Bolger & Zuckerman, 1995); and a complete, detailed analysis would need to incorporate more proximal process variables such as perceptions of competence and self-determination. As such, the proposed models are provided primarily for their heuristic value.

In closing, our research demonstrates the utility of both the approach–avoidance distinction and the personal goals construct in accounting for variation in physical symptomatology. The approach–avoidance distinction has a long and rich history in scientific psychology and is present, in implicit or explicit form, in a number of variables in the personality–illness/well-being literature. The personal goals unit of analysis nicely complements the disposition and coping strategy constructs that are utilized in most personality–illness/well-being research, and the personal goals approach seems relatively easy to implement, either alone or in conjunction with the more established approaches. Accordingly, we believe that both the approach–avoidance distinction and the personal goals approach have the potential to make a substantial contribution to the personality–illness/well-being literature in general, and we suspect that both...
will indeed figure prominently in the development of integrative theoretical models in this domain.

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