

## The Effect of Intolerance of Uncertainty, Perfectionism and Autonomy/Sociotropy on Worry

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The purpose of this study was to investigate the effect of intolerance of uncertainty, multidimensional perfectionism, autonomy/sociotropy, and the interactions between multidimensional perfectionism and autonomy/sociotropy on worry. A total of 278 university students completed questionnaires on worry (PSWQ), intolerance of uncertainty (IUS), multidimensional perfectionism (MPS), and autonomy/sociotropy (PSI). The data were analyzed through stepwise regression analysis. The results showed that intolerance of uncertainty, sociotropy, self-oriented perfectionism, and the interaction between self-oriented perfectionism and autonomy significantly predicted worry, in support of the hypothesis. However, socially prescribed perfectionism, and the interaction between socially prescribed perfectionism and sociotropy did not significantly predict worry. The implications and limitations of this study are discussed, and directions for future research are suggested.

*Key words : worry, intolerance of uncertainty, multidimensional perfectionism, autonomy, sociotropy*

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Worry is a common cognitive phenomenon that everyone experiences once in a while. 38% of people report worrying at least once a day (Tallis, Davey, & Capuzzo, 1994). In general, worry stops naturally and does not cause great interference with an individual's everyday life. It even has a positive function such as motivating people to act. However, when it becomes uncontrollable, excessive and chronic, worry can be so disruptive that it prevents an individual from functioning normally at school, at work or even in everyday life. Excessive worry is also a defining symptom of Generalized Anxiety Disorder (GAD) and an important characteristic in 40 to 60% of other anxiety disorders (Barlow, 1988) that appear in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994).

The earliest form of research related to worry can be found in the test anxiety literature (Borkovec, Ray, Stöber, 1998). However, with the suggestions that worry is not simply an epiphenomenon of anxiety, but is worth to be investigated on its own (Davey, Hampton, Farrell, & Davidson, 1992; Davey & Tallis, 1994; Zebb & Beck, 1998), systematic research devoted to understanding worry began in the early 1980s (Borkovec et al., 1998).

Attempts to identify factors or personality characteristics that explain and predict worry well have accumulated in the past 20 years (see Borkovec et al., 1998; Heimberg, Turk, & Mennin, 2004; for a review). This paper has selected the personality characteristics that are

most relevant to worry from the studies carried out by different researchers and aims to examine their effect on worry simultaneously. Moreover, the role of autonomy and sociotropy, which are relatively stable personality dimensions and have usually been investigated with relation to depression, are explored in this study in terms of their effect on worry. The following section reviews each of the personality characteristics in relation to worry.

### Intolerance of Uncertainty

One of the most recent, compelling, and intensively investigated concepts in the worry literature is intolerance of uncertainty which is defined as "a predisposition to react negatively to an uncertain event or situation, independent of its probability of occurrence and of its associated consequences" (Ladouceur, Gosselin, & Dugas, 2000b, p.934). Intolerance of uncertainty has been confirmed to predict excessive worry well and to distinguish GAD which is characterized by pathological worry from other anxiety disorders and mental disorders (Buhr & Dugas, 2002; Buhr & Dugas, 2006; De Bruin, Rassin, & Muris, 2006; Dugas, Freeston, & Ladouceur, 1997; Dugas, Gagnon, Ladouceur, & Freeston, 1998; Dugas, Gosselin, & Ladouceur, 2001; Dugas et al., 2005; Dugas, Schwartz, & Francis, 2004; Ladouceur et al., 2000b; Laugesen, Dugas, & Bukowski, 2003). The high correlation between worry and intolerance of uncertainty remains even after controlling for anxiety or depression

(Dugas et al., 1997; Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994). Moreover, experimental research shows that high worriers perform worse than low worriers as the ambiguity level of a task increases (Metzger, Miller, Cohen, Sofka, & Borkovec, 1990). High worriers also require a relatively greater amount of information before making a decision (Tallis, Eysenck, & Mathews, 1991a), and such an 'elevated requirement of evidence' can be the result of intolerance of uncertainty and function as a means of decreasing the level of uncertainty.

### Multidimensional Perfectionism

Perfectionists who set unrealistically high standards and have a strong fear of failures and concern about negative evaluation by others tend to worry a lot constantly. A strong association between perfectionism and worry is reported in numerous studies (Chang, 2000; Joormann & Stöber, 1997; Kawamura et al., 2001; Pratt, Tallis, & Eysenck, 1997; Santanello & Gardner, 2006; Stöber & Joormann, 2001).

Acknowledging perfectionism as being multidimensional rather than unidimensional in its nature, researchers have distinguished between different aspects of perfectionism and found their differential relationship to worry. For instance, among the six dimensions of perfectionism that are conceptualized by Frost, Marten, Lahart, and Rosenblate (1990), Concern over Mistakes and Doubts about Action are

found to contribute to an increased level of worry whereas Personal Standards, Parental Criticism, Parental Expectations, or Organization do not (Borkovec et al., 1998; Kawamura et al., 2001; Santanello & Gardner, 2006; Stöber & Joorman, 2001).

In the meanwhile, another cardinal and popular conceptualization of perfectionism has received relatively little attention in the worry literature. Unlike Frost and his colleagues (1990), Hewitt and Flett (1991) emphasized both intrapersonal and interpersonal contexts of perfectionism by suggesting three dimensions according to the object to whom the perfectionistic standards are directed and by whom they are prescribed: self-oriented perfectionism (SOP) involves setting unrealistically stringent standards for oneself, socially prescribed perfectionism (SPP) is perceiving that significant others have overly high standards on oneself, and other-oriented perfectionism (OOP) is characterized by expecting others to be perfect. These perfectionism dimensions are demonstrated to be highly associated with various indices of psychopathology and adjustment difficulties (see Hewitt & Flett, 1991, for a review), but surprisingly little research has been carried out in relation to worry *per se*. Other investigators have also pointed out the necessity to examine both intraindividual and interindividual personality components when studying a pathological phenomenon (Kiesler, 1982; McLemore & Benjamin, 1979; Millon, 1981). Considering that everyone necessarily forms a

part of larger social contexts, the possibility that such a framework can offer a more refined view for the nature of worry, and the lack of research relating worry to Hewitt's dimensions of perfectionism, worry needs to be further investigated in relation to the three dimensions of perfectionism which contain both self-related and social aspects.

Among the three dimensions of perfectionism, only self-oriented perfectionism and socially prescribed perfectionism, and not other-oriented perfectionism, are expected to increase worry. Taking into account the object to whom the perfectionistic standards are prescribed, it is reasonable to expect a higher level of worry when the stringent standards are set on oneself rather than on others. Believing that other people who are important to oneself expect perfect results from oneself (i.e. socially prescribed perfectionism) will lead to a high level of worry due to the concern about the possibility of not meeting the standards, all the more because they are perceived to be out of one's control. Establishing perfect standards on oneself (i.e. self-oriented perfectionism) will also lead to an increased level of worry because of the pressure and stress to be perfect which is impossible in reality and the fear of any small mistakes. However, when one expects perfect standards in other people's behavior and stringently evaluates them, they are unlikely to suffer from worrying, considering that worry, by its nature, involves preventing aversive future events happening to oneself rather than to others.

## Autonomy/Sociotropy

Autonomy means a strong need for and excessive concern about individualistic and independent achievement issues while sociotropy means a strong need for and excessive concern about interpersonal relationships (Beck, Epstein, Harrison, & Emery, 1983; Robins et al., 1994). The terms were first developed by Beck and his colleagues (1983) who postulated that they both confer vulnerability to depression. Various researchers have since then examined their influence on depression; however, recent studies suggest that they are not personality characteristics that are specific or unique to depression. Nietzel and Harris (1990) pointed out that "we do not know to what extent dependency needs or achievement/autonomy needs are uniquely associated with depressive experiences versus anger, anxiety or negative affects" (p.293).

Subsequently, numerous studies with both non-clinical and clinical subjects have suggested that sociotropy, and possibly autonomy, may be related as much to anxiety as to depression (Alford & Gerrity, 1995; Clark & Beck, 1991; Moore & Blackburn, 1994; Persons, Burns, Perloff, & Miranda, 1993; Robins, Block, & Peselow, 1989). Besides, sociotropy was related to anxiety symptoms in an empirical study (Robins et al., 1997), and in another study (Alford & Gerrity, 1995), sociotropy predicted anxiety but not depression.

The emerging data evidencing the relationship of autonomy/sociotropy to anxiety

suggests the possible relationship between autonomy/sociotropy and worry which is a cognitive symptom of anxiety. Besides, both individualistic achievement issues and interpersonal issues are major sources of stress in everyday life, and individuals who score high on either of those two personality dimensions are expected to worry constantly and excessively.

### Interaction between Multidimensional Perfectionism and Autonomy/Sociotropy

Prior findings have reported that perfectionism can aggravate the aversiveness of the experienced stress and perceived difficulties of the near-future events (Hewitt & Flett, 1993; Brown et al., 1999). Moreover, the specific vulnerability hypothesis of Hewitt, Flett, and Ediger (1996) postulates that stressors which are congruent with a particular perfectionistic style are experienced as more aversive than noncongruent stressors. According to their hypothesis, they proposed that self-oriented perfectionism interacts only with achievement stress to predict depression whereas socially prescribed perfectionism interacts only with social stress.

In line with this hypothesis, in the present study, self-oriented perfectionism is expected to interact only with autonomy, and socially prescribed perfectionism only with sociotropy, to predict worry. If a highly self-oriented perfectionist is also very susceptible to the implication that he or she has failed to achieve his or her goals or exercise control over him or

herself and has a strong need for independent achievement (i.e. highly autonomic), they will worry significantly more than someone who is a highly self-oriented perfectionist but is not highly autonomic. On the other hand, for someone with a high level of socially prescribed perfectionism and also with an excessive need for approval from and dependency on others (i.e. highly sociotropic), the level of worry will be much greater than someone with a high level of socially prescribed perfectionism but without a high level of sociotropy.

### Objectives and Hypotheses

The present study aims to examine and explore the influence of the above mentioned personal characteristics on worry. Intolerance of uncertainty is a personality characteristic of which the effect on worry is very strong according to numerous recent studies, and is also included in the present study. This study also explores the effect of Hewitt's multidimensional perfectionism on worry. Despite the extensive research on the maladaptive effects of perfectionism, Hewitt's three dimensions of perfectionism which are categorized according to who sets the stringent standards and on whom, have rarely been investigated in relation to worry. In addition, the role of autonomy and sociotropy, which have mainly been limited to the depression literature, is explored in the present study. Recent findings have reported that they are not personality characteristics that are unique or

specific to depression, and positive correlations have been found with anxiety symptoms. Moreover, according to Hewitt's specific vulnerability hypothesis, each of the perfectionism dimensions is expected to interact with a congruent vulnerability or stress, that is, self-oriented perfectionism with autonomy, and socially prescribed perfectionism with sociotropy, to influence worry.

It is hypothesized that intolerance of uncertainty, self-oriented perfectionism, socially prescribed perfectionism, autonomy, and sociotropy will increase worry. In addition, it is hypothesized that self-oriented perfectionism will interact only with autonomy, and socially prescribed perfectionism only with sociotropy, to influence worry.

## Method

### Participants

Three hundred and five participants ( $N=305$ ) were recruited from the undergraduate participant pool of the Department of Psychology at a university in Seoul. After excluding twenty-five participants with any missing data and two outliers based on the Mahalanobis' Distance, two hundred and seventy-eight participants ( $N=278$ ) remained of which 132 (47.48%) were males and 145 (52.16%) were females. Information regarding gender was missing for one participant. They averaged 20.84 years of age ( $SD=2.66$ ).

### Instruments

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990; Korean version translated by Kim & Min, 1998). The PSWQ consists of 16 items that measure the tendency to engage in excessive, uncontrollable, and generalized worry. Participants indicate their response on a 5-point Likert scale ranging from 1='not at all typical of me' to 5='very typical of me'. The PSWQ is a unifactorial measure with excellent internal consistency,  $\alpha = .86$  to  $.94$ , and test-retest reliability over 8-10 weeks,  $r = .92$  (Meyer et al., 1990). The Korean version which was used in this study was translated by Kim and Min (1998) who reported very good internal consistency,  $\alpha = .92$ . The internal consistency was  $.93$  in this study.

Intolerance of Uncertainty Scale (IUS; Freeston et al., 1994; Korean version translated by Choi, 1997). The IUS is comprised of 27 items relating to uncertainty, emotional and behavioral reactions to ambiguous situations, implications of being uncertain, and attempts to control the future. Participants rate items on a five-point Likert scale ranging from 1='not at all characteristic of me' to 5='entirely characteristic of me'. Higher scores indicate an increased level of intolerance of uncertainty. The original French version of the IUS has very good internal consistency,  $\alpha = .91$ , and test-retest reliability over a five-week period,  $r = .78$ . In this study, the 4-point Korean version by Choi (1997), who translated the

English version of Buhr and Dugas (2002), was used. The internal consistency of the present study was .89.

Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991; Korean version translated by Han, 1993). The MPS is a 45-item scale that includes three 15-item subscales of Self-Oriented Perfectionism, Socially Prescribed Perfectionism, and Other-Oriented Perfectionism. Participant respond on a 7-point scale ranging from 1='strongly disagree' to 7='strongly agree'. Each subscale of the MPS has good internal consistency,  $\alpha = .86, .87,$  and  $.82$  for SOP, SPP, and OOP, respectively. The Korean version which was translated by Han (1993) had internal consistency of  $.84, .76,$  and  $.73$ . In this study, internal consistency was  $.92$  for all the items, and  $.91, .81, .80$  for SOP, SPP, and OOP, respectively.

Personal Style Inventory (PSI; Robins et al., 1994 Korean version translated by Kim and Kim, 1998). The PSI is a revised version of the Sociotropy-Autonomy Scale (SAS; Beck et al., 1983) and is a new measure of interpersonal and achievement vulnerabilities. The inventory contains 48 items composed of two 24-item subscales, Sociotropy and Autonomy. Participants rate items on a 6-point Likert scale, ranging from 1='strongly disagree' to 6='strongly agree'. Both scales had excellent internal consistency,  $\alpha = .90$  for Sociotropy and  $\alpha = .86$  for Autonomy (Robins et al, 1994). The test-retest reliabilities were  $.80$  for Sociotropy and  $.70$  for Autonomy over a 5- to 13-week period (Robins et al., 1994). In this

study, the Korean version translated by Kim and Kim (1998) was used, and the internal consistency was  $.88$  for Sociotropy and  $.84$  for Autonomy.

## Procedure

Participants were asked to complete the Korean versions of the four questionnaires with 136 items in total and to supply demographic information. In exchange for participating in this study, the participants received a partial credit for the course in which they were enrolled.

## Statistical Analysis

SPSS 12.0 was used for the overall statistical analyses. Stepwise multiple regression analysis was conducted in order (1) to examine which of the independent variables - intolerance of uncertainty, each dimension of perfectionism, autonomy, sociotropy, and interaction terms between each dimension of perfectionism and autonomy or sociotropy - make meaningful contributions to the overall prediction of worry and (2) to see how much variance of worry is explained by the predicting variables.

## Results

### Descriptive Statistics and Correlations

Means and standard deviations for the main

Table 1. Means and Standard Deviations for Study Measures (N=278)

Variable (Measure)	M(SD)
Worry (PSWQ)	51.77 (11.52)
Intolerance of Uncertainty (IUS)	61.74 (11.50)
Perfectionism (MPS)	191.76 (29.96)
Self-Oriented Perfectionism	72.71 (14.47)
Socially Prescribed Perfectionism	59.90 (11.14)
Other-Oriented Perfectionism	59.16 (10.94)
Autonomy (PSI)	83.75 (13.49)
Sociotropy (PSI)	95.30 (15.03)

Note. PSWQ = Penn State Worry Questionnaire; IUS = Intolerance of Uncertainty Scale; MPS = Multidimensional Perfectionism Scale; PSI = Personality Style Inventory.

Table 2. Correlations Among the Variables

	1	2	3	4	5	6	7	8
1. Worry	—							
2. IU	.64**	—						
3. Perfectionism Total	.44**	.44**	—					
4. SOP	.38**	.33**	.86**	—				
5. SPP	.43**	.48**	.78**	.48**	—			
6. OOP	.27**	.29**	.81**	.55**	.47**	—		
7. Autonomy	.32**	.45**	.36**	.25**	.39**	.25**	—	
8. Sociotropy	.56**	.47**	.33**	.22**	.39**	.22**	.18**	—

Note. IU = Intolerance of Uncertainty; SOP = Self-Oriented Perfectionism; SPP = Socially Prescribed Perfectionism; OOP = Other-Oriented Perfectionism.

\*\*  $p < .01$ .

variables are presented in Table 1, and the Pearson's correlation matrix is presented in Table 2. Worry was highly and positively correlated with intolerance of uncertainty,  $r = .64$ ,  $p < .01$ , sociotropy,  $r = .56$ ,  $p < .01$ , self-oriented perfectionism,  $r = .38$ ,  $p < .01$ ,

and socially prescribed perfectionism,  $r = .43$ ,  $p < .01$ . Worry was moderately and positively correlated with autonomy,  $r = .32$ ,  $p < .01$ , and weakly correlated with other-oriented perfectionism,  $r = .27$ ,  $p < .01$ . The correlation coefficients between all the study



measures were significant at the significance level of .01.

The Effect of Intolerance of Uncertainty, Autonomy, Sociotropy, Dimensions of Perfectionism and Their Interactions with Autonomy or Sociotropy on Worry: Stepwise Regression Analysis

Preliminary analyses confirmed that all variables respected the conditions of normality, linearity, and homoscedasticity. Twenty-five cases with any missing values were excluded, and two outliers based on the Mahalanobis' Distance were also excluded from the data.

Stepwise multiple regression analysis showed that intolerance of uncertainty, sociotropy, self-oriented perfectionism, and the interaction between self-oriented perfectionism and autonomy significantly predicted worry. The results are displayed in Table 3.

Intolerance of uncertainty alone accounted for 40.8% of worry. Sociotropy explained another 8.3%, and self-oriented perfectionism explained another 2.7% in worry. These changes in the

variance of worry were all significant at the level of  $p < .001$ . Finally, the interaction between self-oriented perfectionism and autonomy accounted for another 1.2% in the variance of worry, which was significant at the level of  $p = .01$ . According to the standardized coefficients ( $\beta$ ), the variable which could predict worry best was intolerance of uncertainty,  $\beta = .438, p < .001$ , and then sociotropy,  $\beta = .284, p < .001$ , self-oriented perfectionism,  $\beta = .179, p < .001$ , and the interaction between self-oriented perfectionism and autonomy,  $\beta = .113, p = .01$ , in a descending order. Overall, all these four variables explained 52.3% of the variance in worry.

The significant interaction between self-oriented perfectionism and autonomy indicates that the association between self-oriented perfectionism and worry changes depending on the level of autonomy. Figure 1 provides a graphical representation of this interaction in which it is apparent that the higher the level of autonomy, the greater the magnitude of the relationship between self-oriented perfectionism and worry.

Table 3. Stepwise Multiple Regression Analysis Predicting Worry

Predicting Variable(s)	$R^2$	Adj. $R^2$	$\Delta R^2$	$\Delta F$	$df$
IU	.408	.406	.408	183.517***	1, 266
IU, Sociotropy	.491	.487	.083	43.228***	1, 265
IU, Sociotropy, SOP	.518	.513	.027	14.851***	1, 264
IU, Sociotropy, SOP, SOP×Autonomy	.530	.523	.012	6.760**	1. 263

\*\*  $p = .01$  \*\*\*  $p < .001$

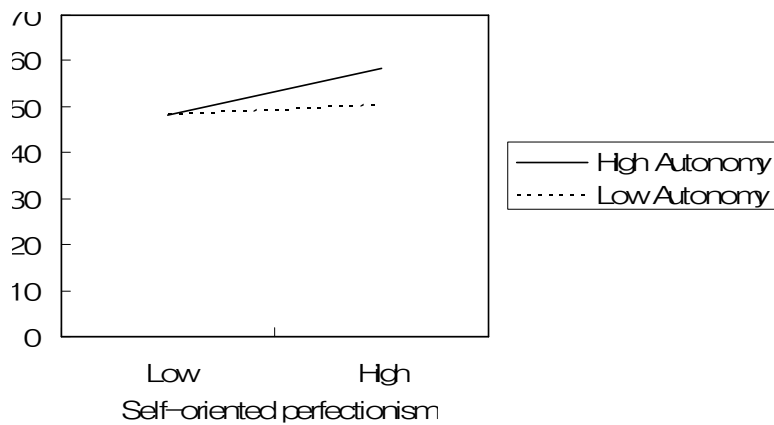


Figure 1. Self-oriented perfectionism interacting with autonomy to predict worry

### Discussion

The present study investigated the effect of intolerance of uncertainty, multidimensional perfectionism, autonomy/sociotropy, and the interaction between multidimensional perfectionism and autonomy/sociotropy on worry. The results showed that as expected, intolerance of uncertainty, sociotropy, self-oriented perfectionism, and the interaction between self-oriented perfectionism and autonomy significantly predicted worry. However, socially prescribed perfectionism, the interaction between socially prescribed perfectionism and sociotropy, or autonomy did not have a significant effect on worry. Of interest and a new finding was that even though autonomy alone did not contribute to the explanation of worry, the interaction between self-oriented perfectionism and autonomy was significant. In other words, having a strong need for independent and individualistic accomplishments does not in itself

lead to excessive worry, but if this characteristic is found in people who set stringent standards on oneself, it functions as a moderator and steeply increases the level of worry.

The result that autonomy alone did not significantly predict worry is consistent with some of the previous findings. For instance, some studies (Alford & Gerrity, 1995; McBride, Bacchioni, & Bagby, 2005) reported that autonomy was not significantly related to anxiety symptoms whereas sociotropy was. Bagby and his colleagues (2001) reported that sociotropy was more strongly correlated with anxiety than autonomy was with anxiety ( $r = .50$ ;  $r = .20$ ,  $p < .01$ , respectively). It appears that the influence of autonomy on worry is relatively weak as well. This relationship needs to be further investigated in future studies.

The result that socially prescribed perfectionism did not increase worry may be due to the following possible reasons. The first possible explanation involves response bias. Flett,

Hewitt, and De Rosa (1996) have pointed out that people with a high level of socially prescribed perfectionism are accustomed to respond in a manner to avoid anticipated criticism by others. Therefore, the participants with a high level of socially prescribed perfectionism in the current study might have answered in a more socially desirable way by underreporting their level of worry, which might have weakened the effect of socially prescribed perfectionism on worry. The second explanation involves the concept of controllability. According to Hewitt and Flett (1991), when the perfectionistic standards are prescribed by other people, it results in the perception of an external locus of control, which in turn leads to a sense of learned helplessness. Thus, it is plausible that socially prescribed perfectionists feel hopelessness regarding the extremely high expectations set by others and give up trying to satisfy them feeling that nothing can be done, rather than worrying and striving to achieve the high standards. The third possibility is related to the age of the sample. According to the individuation theory (Youniss & Smollar, 1985), the need and striving for autonomy in making decisions gradually increases during adolescence. For the participants in their late adolescence in this study, the impact of the opinion by others may be relatively weaker than their own, and the perfectionistic standards that are established by others and not by themselves may have little influence on their psychological state.

The present study contributes to the existing

literature on worry and offers implications in the following ways. First, it confirmed the robust influence that intolerance of uncertainty has on worry. When treating anxiety disorders that are characterized by excessive worry, it would be essential to increase the client's tolerance level toward uncertainty. Second, the present study investigated Hewitt's multidimensional perfectionism which has relatively been neglected in the worry literature compared to the perfectionism dimensions of Frost. And as a result, it was found that the effect of perfectionism on worry differs depending on who sets the perfectionistic standards. Another important point when treating excessive, chronic worry will be to deal with and reduce the perfectionistic standards which the client establishes on himself/herself. Third, the personality dimensions of autonomy/sociotropy which has been restricted to the depression research were first employed in this study to examine their effect on worry. It has recently been pointed out that autonomy/sociotropy personality characteristics are not vulnerability factors only for depression, but also for anxiety disorders. Such attempts extend the usefulness of the autonomy/sociotropy dimensions in identifying the risk factors for other mental disorders. The present study demonstrated that sociotropy indeed increased worry. Besides, autonomy was found to moderate the strength of relationship between self-oriented perfectionism and worry. Reducing the sociotropic tendency of excessive concern about interpersonal relationships and an exaggerated preoccupation with being

loved will be beneficial in the treatment of pathological worry. Further, dealing with the autonomic tendency in highly self-oriented perfectionists will also be useful in decreasing the level of worry.

Future work should address the following limitations of the present study. First, the correlational nature of this study precludes inferring causality. Use of longitudinal designs or experimental investigations will extend the importance of the current findings. Second, only a nonclinical sample from a university participated in this study. Replications with both clinical and nonclinical samples with a broader demographical range will make the findings more generalizable.

In sum, the present study contributes to a growing literature on worry by advancing one more step in an effort to elucidate the origins, maintenance and manifestation of worry and to enhance the effectiveness of treatment for people who suffer from the adverse effects of excessive worry.

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