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Cognitive Balance: States-of-Mind Model and Mental Health among French Students

Muaweah Alsaleh, Romain Lebreuilly, Joëlle Lebreuilly, and Manuel Tostain

In the current study the authors examined the role of negative and positive thinking in the depression and anxiety level of 114 students between seventeen and twenty-six years of age using the Negative and Positive Automatic Thoughts Questionnaires, as well as the Beck Depression Inventory and Beck Anxiety Inventory questionnaires. Positive thinking and states of mind (SOM) were negatively correlated with both depression and anxiety indicators, whereas negative thinking was positively correlated with depression and anxiety. Multiple linear regression results showed that negative thinking ($p < .01$) had a significant effect on incremental unique variance in anxiety. It was also found that SOM ($p < .01$) and positive thinking ($p \leq .05$) had a significant effect on incremental unique variance in depression, whereas SOM and positive thinking ($p > .05$) did not have a significant effect on incremental unique variance for anxiety. In conclusion, negative thinking and SOM ratios were the strongest predictors of mental health among students; positive thinking was not the strongest predictor of mental health among students.

Key words: cognitive balance; mental health; negative and positive thinking

Introduction

The changes in cognitive balance and specific deviations from this balance are associated with psychopathology and mental disorder, but an optimal balance of positive and negative cognitions characterizes normal psychological functioning and mental health (Schwartz, 1986; Schwartz & Garamoni, 1986, 1989). The states of mind (SOM) ratio [positive thoughts/(negative thoughts + positive

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thoughts)]is perhaps the best predictor of psychological well-being and mental health. The mental health of a person is also perceived as being largely determined by the kind of thoughts that inhabit his or her mind for a day. Automatic thoughts are the central concept of several theories dealing with psychopathology (Ingram, Kendall, Siegle, Guarino, & McLaughlin, 1995).

Theoretical and empirical literature on cognitive-behavioral therapy (CBT) has focused attention on the dysfunctional consequences of excessive negativity in automatic thoughts such as internal dialogue and the therapeutic benefits of altering these negative automatic thoughts (Beck, Rush, Shaw, & Emery, 1979). The assessment of both positive and negative cognitions may contribute to a better understanding of psychopathology and to the development of more effective treatments (Kendall, 1983).

Schwartz and Garamoni (1989) observed that cognitive balance may represent a crucial aspect of psychological self-regulation, or cognitive homeostasis, that can be measured as a form of *mental temperature*. Current research has studied the SOM ratio to understand the role and significance of cognitive balance in mental health. Schwartz and Garamoni (1986, 1989) developed the SOM model, which suggests that adaptive psychological functioning is characterized by an optimal balance of positive and negative cognitions. The SOM model provides a structure for evaluating the relationship between psychopathology and the balance of positivity and negativity dimensions when processing information. This model makes it possible to simultaneously study these two dimensions. The absolute number of negative and positive thoughts may not be what is predictive of mental health, but rather the relative balance of positive and negative thoughts, as Schwartz and Garamoni suggest. In the original SOM model, the optimal balance between positive and negative thoughts, or the amount of positive thoughts divided by the sum of positive (P) and negative (N) thoughts [$P/(P + N)$] was 0.62, in a theoretical range of 0 to 1.

The central hypothesis of the model is that healthy functioning will be characterized by an optimal balance of positivity and negativity, and that psychopathology will be marked by deviations from the optimal balance. The model defines five SOM according to their different ratios [$P/(P + N)$] of positive to total positive and negative cognitions and/or effects. Those five SOM are defined by five different parameter values (0, 0.37, 0.50, 0.63, and 1; Schwartz & Garamoni, 1986, 1989) corresponding to differences between optimal, healthy, subnormal, and pathological balances of positive and negative thoughts.

The negative monologue, defined by a ratio of .31 to .00, characterizes severe psychopathology, such as acute periods of panic or profound depression and/or anxiety. This ratio is associated with an unstable state of mind. The negative dialogue, defined by a .32 set-point ratio and a range of $.38 \pm .06$ (.32 to .44), is associated with moderate psychopathology (i.e., moderate anxiety and/or depression). The internal dialogue of conflict, defined by a .50 set-point ratio and a range of $.50 \pm .05$ (.45 to .55), is associated with mild levels of psychopathology (i.e., doubt, ambivalence, and mild anxiety/depression). The positive dialogue is an

internal dialogue defined by a .61 set-point ratio and a range of $.62 \pm .06$ (.56 to .68). This state of mind is characterized by the optimal balance between cognitive and affective structure, corresponding to an adaptive and flexible balance in healthy persons in neutral situations. This theoretically optimal state of mind is positively balanced, but at the same time includes sufficient negative cognition to remain realistically cautious. The positive monologue, defined by a range of .69 to 1.00, is characterized by an unhealthy balance (i.e., excessive positivity, mania, and unrealistic optimism). Although adaptive for transitory periods, this state of mind is associated with maladaptive states of mania and hypomania if continually sustained at high levels (see Schwartz & Garamoni, 1986, for details of the model).

These five SOM, which vary between interpersonal (talking to another) and intrapersonal (talking to oneself) communications, form a continuum of inner dialogues or monologues. Three SOM (positive dialogue, internal dialogue of conflict, and negative dialogue) are dialogical forms. Two SOM (positive monologue and negative monologue) are monological forms. Negative monologues and positive monologues are based on assumptions associated with different forms of psychopathology. Also, according to Schwartz and Garamoni (1989), this model is supported by some studies dealing with anxiety, depression, and stress using instruments to measure positive and negative cognitions. This model will be used in this study and it will be related to mental health.

Studies have supported the SOM model in a range of adult samples including healthy students or adults (Calvete & Connor-Smith, 2005; Garamoni et al., 1991), people with test anxiety (Diaz, Glass, Arnkoff, & Tanofsky-Kraff, 2001), or people with subclinical social fear (Sturmer, Bruch, Haase, & Amico, 2002). The SOM model has also been supported in adult clinical samples with social phobia (Beazley, Glass, Chambless, & Arnkoff, 2001), agoraphobia (Michelson, Schwartz, & Marchione, 1991), or depression (Garamoni et al., 1991). Finally, Amsel and Fichten (1998) proved that answering scales with end points of 1 to 5 restrict the range of the SOM ratio. They therefore recommended calculating the SOM ratio based on an answering scale with an end point of 0 to 4.

The Present Study

The purpose of the current study is to examine the role of both negative and positive thoughts and the SOM ratio using several important psychological variables that indicate the mental health (depression or anxiety) of a nonclinical sample consisting of Caen students between seventeen and twenty-six years old. A questionnaire with an answering scale between 0 and 4 was used to measure different negative and positive thoughts.

A number of hypotheses were examined in the current study. Hypothesis 1 states that negative thinking (NT) would be positively correlated with depression and anxiety, whereas hypotheses 2 and 3 state that positive thinking (PT) and SOM would be negatively correlated with depression and anxiety:

- H1: NT + depression and anxiety.
- H2: PT - depression and anxiety.
- H3: SOM - depression and anxiety.

Following the cognitive model and the Power of the Non-negative Thinking (PNT) hypothesis, the authors expected the student sample aged between seventeen and twenty-six to have more positive thoughts than negative thoughts. Additionally, the authors expected that students whose SOM ratio was optimal (positive dialogue) would have better mental health than students who had other values of SOM ratio. Finally, for these students, the authors expected that negative thoughts and SOM ratios would be better predictors of anxiety and depression levels than positive thoughts.

Method

Participants

One hundred and fourteen students from the University of Caen participated in this study. The average age was 18.98 years ($SD = 1.41$). There were ninety-seven (85%) females and seventeen (15%) males. The ethnicity of these 114 students was French (100%). Participation was voluntary and responses were anonymous.

Inclusion Criteria

Male and female students between seventeen and twenty-six years old were included in the study. All students were French.

Measures

Negative Automatic Thoughts Questionnaire (ATQ-N) The Negative Automatic Thoughts Questionnaire (Hollon & Kendall, 1980) was designed to measure the frequency of negative thoughts. These negative thoughts are hypothesized to play an important role in the development, maintenance, and treatment of various psychological maladjustments, including depression (Beck et al., 1979) and anxiety (Beck, Emery & Greenberg, 1985). The thirty items on the ATQ-N are scored on a five-point Likert scale format (1 = *not at all*, 2 = *sometimes*, 3 = *moderately often*, 4 = *often*, 5 = *all the time*). The total score is a sum the scores for all thirty items. The ATQ has excellent internal consistency and has good concurrent validity for depression (Hollon & Kendall, 1980).

Positive Automatic Thoughts Questionnaire (ATQ-P) The ATQ-P (Ingram & Wisnicki, 1988) was developed as the theoretical complement to the ATQ-N. The ATQ-P is a thirty-item self-report instrument that measures the frequency of positive thoughts. The thirty items on the ATQ-N are scored on a five-point Likert scale format (1 = *not at all*, 2 = *sometimes*, 3 = *moderately often*, 4 = *often*, 5 = *all the*

time). The total score is a sum of the scores for all thirty items. The ATQ-P is reported to be reliable, able to discriminate between psychopathological and non-psychopathological states, unaffected by social desirability influences, capable of good convergent and discriminant validity, and sensitive to change in affective states (Ingram, Kendall, Siegle & Guarino, & McLaughlin, 1995).

Mental Health The Beck Depression and Anxiety Inventory, including cognitive, affective, and physiological aspects of depression and anxiety, was used in this study.

The Beck Depression Inventory (thirteen items; BDI-13) is a self-report measure that assesses depressive symptoms. Each item contains four statements reflecting varying degrees of symptom severity. Respondents are instructed to circle the number (ranging from 0 to 3, indicating severity) that corresponds to the statement that best describes them. The total BDI-13 score can range from 0 to 39. The BDI-13 has demonstrated high internal consistency, good test-retest reliability, and good construct and concurrent validity with other common measures of depression in clinical and nonclinical samples (Beck, Steer, & Brown, 1996; Whisman, Perez, & Ramel, 2000). Like the original version, the short version differentiates depressed subjects from nondepressed subjects and nondepressed anxious subjects, but it does not allow differentiating anxious depressed subjects from non-anxious depressed subjects (Bruch, Mattia, Heimberg, & Holt, 1993; Collet & Cottraux, 1986).

The Beck Anxiety Inventory (BAI; Beck et al., 1988) is a twenty-one-item self-report inventory for measuring the severity of anxiety. Respondents are instructed to circle the number representing one of the four alternatives, which range from no anxiety (1 = *not at all*) to severe anxiety (4 = *severe* or *I could barely stand it*). The total BAI score can range from 21 to 84. The BAI has demonstrated high internal consistency and test-retest reliability and good concurrent and discriminant validity (Beck, Epstein, Brown & Steer, 1988; Beck & Steer, 1991; Fydrich, Dowdall, & Chambless, 1992; Riskind, Beck, Brown, & Steer, 1987). Moreover, the BAI was carefully constructed to avoid confusion with depression.

Procedure and Data Analysis Participants were first year undergraduate psychology and sociology students at the University of Caen, Lower Normandy. The ATQ-N, ATQ-P, BDI, and BAI questionnaires were used in this study. Before completing the questionnaires, participants were asked to read the instructions. This study received approval from the Psychology Department's Human Research unit (CERReV Laboratory, MRSH) at Caen University, Lower Normandy.

In addition to descriptive statistics and correlational analyses, there were two sets of two multiple linear regression analyses for each of the two dependent variables of mental health—depression and anxiety—using three models (forward, backward, and stepwise) of multiple linear regression and the same five predictors of gender, age, positive thinking (positive automatic thoughts), negative thinking (negative automatic thoughts), and SOM in each analysis. Multiple linear regres-

sion was performed using SAS computer software. A narrow age range was selected to control its impact on the variables and the results of study.

Results

Sample Descriptives

Means (*M*) and standard deviations (*SD*) of the six variables measured in this study (number of students $n = 114$) were, respectively, age = 18.98, 1.41; negative thinking = 18.47, 15.76; positive thinking = 56.10, 20.61; depression = 4.83, 4.34; anxiety = 29.27, 7.09; and SOM = 0.75, 0.16.

The various correlation coefficients between the variables used in the study are reported in Table 1. Age was significantly correlated with gender and positive thoughts. Gender was significantly correlated with depression. Negative thoughts were inversely correlated with positive thoughts. Depression was significantly correlated with anxiety.

Table 1 Bivariate Correlations among Variables

Measure	1	2	3	4	5	6	7
1. Age	—	.15*	-.02	-.10*	-.00	-.04	.02
2. Gender		—	.07	.01	-.03	.10*	-.09
3. Negative thinking			—	-.25**	-.91**	.76**	.58**
4. Positive thinking				—	.54**	-.43**	-.23**
5. SOM ratio					—	-.78**	-.57**
6. Depression						—	.56**
7. Anxiety							—

Note: * $p < .05$ (2-tailed)**; $p < .01$ (2-tailed)

Thinking and Mental Health

The authors studied the relationship between both types of thinking, SOM ratios, and mental health, including depression and anxiety aspects of mental health.

Thinking and Depression Depression was significantly correlated with SOM ratios, negative thinking, positive thinking, and gender in descending order of magnitude (see Table 1). Multiple linear regression analyses showed that SOM ($p < .01$), positive thinking, and negative thinking ($p \leq .05$) significantly affect depression. Gender and age do not significantly affect depression (see Table 2).

Thinking and Anxiety Anxiety was significantly correlated with negative thinking, SOM ratios, positive thinking, and gender in descending order of magnitude (see Table 1). Multiple linear regression analyses showed that only negative thinking ($p < .01$) significantly affected anxiety. Gender, age, positive thinking, and SOM ($p > .05$) did not significantly affect anxiety (see Table 2).

Table 2 Summary of Multiple Linear Regression Analyses for Variables Predicting Depression and Anxiety

Step	Variable	Labels	R ²	R ² model	C(p)	F value	P _r > F
Depression							
1	SOM ratio	SOM ratio	0.61	0.61	8.45	172.80	.00**
2	Positive thinking	Positive thinking	0.01	0.63	4.43	4.27	0.04*
3	Negative thinking	Negative thinking	0.01	0.62	6.71	3.62	0.05*
4	Gender	Gender	0.00	0.64	5.27	1.16	0.28
5	Age	Age	0.00	0.64	6.00	1.27	0.26
Anxiety							
1	Negative thinking	Negative thinking	0.34	0.34	2.65	57.41	.00**
2	Gender	Gender	0.02	0.36	1.55	3.14	0.06
3	SOM ratio	SOM ratio	0.00	0.37	4.12	0.12	0.73
4	Age	Age	0.00	0.36	2.43	0.31	0.58
5	Positive thinking	Positive thinking	0.01	0.36	1.55	1.13	0.29

Note: * $p < .05$; ** $p < .01$.

SOM and Aspects of Mental Health

The results (means and standard deviations) show the two components of mental health (depression and anxiety) according to the five SOM. The results also show the number of participants associated with each of the SOM. In fact, only 1 participant had a negative monologue, 5 maintained a negative dialogue, 10 had an internal dialogue of conflict, and 18 had a dialogue that can be characterized as optimal (positive dialogue according to the criteria proposed by Schwartz & Garamoni, 1986). A high number of participants, 80 out of 114 (70.18%), had an unadapted SOM ratio (too positive according to the authors because it is located within the limits of positive monologue, between 0.69 and 1). In other words, in this sample of students, the authors noted that four times more students had a SOM ratio called positive monologue ($N = 80$, unadapted state of mind) compared to those found within the positive dialogue ($N = 18$, adapted state of mind).

The authors tested differences in average mental health variables (depression and anxiety) between participants who had a positive dialogue versus participants who had a positive monologue because they were the only groups for which the number of subjects was sufficiently high. The results present the means and standard deviations of depression and anxiety among participants who showed a positive dialogue or positive monologue.

For each category of the five SOM, the authors studied the two mental health variables. They examined the t student values in both categories (positive dialogue and positive monologue). The addition of a T test helps demonstrate significant differences between the two groups regarding depression [$t(96) = 5.40, p < .001$] and anxiety [$t(96) = 3.80, p < .001$]. This means that there are statistically significant differences between positive dialogues and positive monologues in depression and anxiety.

In conclusion, participants having a positive monologue seemed to report a depression and anxiety that were significantly lower than those of participants having a positive dialogue level. The authors' third hypothesis was refuted. Indeed, the students whose mind-set was optimal (positive dialogue) had poorer mental health than students who had a positive monologue. The analysis of average values of variables showed that students who had a positive monologue presented with significantly better mental health (decreased levels of depression and anxiety) than those who had a positive dialogue. However, it must be remembered that positive monologue as an unadapted SOM is considered too positive according to Schwartz and Garamoni (1986). It is difficult to interpret the mixed evidence. One possible explanation is the age and/or number of participants.

Discussion

The purpose of the current study was to examine the role of both negative and positive thoughts and the SOM ratio in a nonclinical sample and several important psychological variables that indicate the mental health (depression and anxiety) among students between seventeen and twenty-six years old in a Caen student sample. The current study focuses on studying negative thinking, positive thinking, and SOM across multiple negative and positive health outcomes and their relationships with mental health, including depression and anxiety aspects of mental health.

Some limitations of the current study must be noted before discussing the findings. First, the findings may not be generalized to clinical samples. Further studies using nonclinical and/or clinical samples are needed to replicate the results. Future studies using experimental or prospective research designs may be helpful to shed light on this issue. An examination of the demographic variables showed that they played a relatively minor explanatory role compared to SOM, negative thinking, and positive thinking. Age did not significantly predict any of the variables because the age range was very narrow, but age was significantly correlated with gender and positive thinking.

Gender was also found not to be correlated with either type of thinking or SOM. This means that males are as likely as females to think both negatively and positively, contrary to common gender stereotypes. According to what was expected based on the PNT hypothesis, students reported both more positive and less negative thoughts. Furthermore, the SOM ratio was the strongest predictor of depression level in mental disorder; but negative thoughts were the strongest predictors of anxiety level in mental disorder. The role of SOM and positive thoughts in the mental disorder model among students clearly needs further research.

Similar to previous research findings (Zahn-Waxler, Crick, Shirlcliff, & Woods, 2006), gender was significantly correlated with depression. Multiple linear regression results showed that the gender effect sizes were weaker when compared to SOM and both types of thinking in depression, but the gender, positive thinking, and SOM effect sizes were not significant when compared to negative thinking in anxiety. These results underlined the importance of examining factors beyond gender when explaining individual differences in mental health.

With regard to the hypotheses being tested, correlational results supported hypotheses 1, 2, and 3. Negative thinking was positively correlated with depression and anxiety (hypothesis 1). For positive thinking and SOM, the reverse pattern was obtained. Positive thinking and SOM were negatively correlated with anxiety and depression (hypotheses 2 and 3). The correlational results obtained were congruent with the theoretical expectations as well as previous research findings. Similar to the studies (e.g., Beck, Rush, Shaw & Emery, 1979; Szentogotai & Freeman, 2007), negative thinking was found to be positively related to depression and anxiety. The multiple linear regression results supported hypotheses 1, 2, and 3 for depression, but not for anxiety.

The multiple linear regression results showed that gender and age ($p > .05$) have no size effect with depression and anxiety. In order of effect size, SOM ($p < .01$) and positive and negative thinking ($p \leq .05$) accounted for more of the incremental unique variance in depression. Negative thinking ($p < .01$) accounted for more of the incremental unique variance in anxiety than positive thinking and SOM ($p > .05$). This result is consistent with the proposal by Kendall (1984) in that the presence of positive thinking may be less important in determining psychopathology than the absence of negative thinking.

The current study uncovered a number of implications. First, the results underlined that SOM ratios were relatively more important than negative thinking and positive thinking in explaining depression, but they also indicated that negative thinking was relatively more important than positive thinking and SOM ratios in explaining anxiety. The results emphasized the importance of examining negative cognition when explaining psychological disorders and mental health. This means that evoking positive thinking and/or SOM ratio alone may not be sufficient to protect oneself from depression and anxiety. Therefore, it is also consistent with the PNT hypothesized by a number of theorists such as Kendall and Chansky (1991). This means that the reduction of depression and anxiety is associated with a reduction of negative thoughts rather than an increase of positive thoughts. Perhaps the severity of one's depression may play a part in determining the frequency of negative and/or positive thoughts present. In the current non-clinical sample, it was found that SOM explained more than negative and positive thinking about the variance in depression, but it was also found that the presence of negative thinking explained more than SOM and positive thinking about the variance in anxiety.

With regard to the hypothesis being tested, students whose SOM ratio was optimal (positive dialogue) had good mental health compared to students who had other values of SOM ratio. The authors' hypothesis was refuted because participants having a positive monologue seem to report depression and anxiety that are significantly lower than those reported by participants who have a positive dialogue level. However, it must be remembered that positive monologue as an unadapted state of mind is considered too positive according to Schwartz and Garamoni (1986).

Negative and positive thoughts and SOM ratios differentially predicted depression and anxiety level depending upon group status. It was found that SOM ratios were the strongest predictors of depression level in mental health, with a large effect on positive thoughts and a medium effect on negative thoughts. However, negative thoughts were the strongest predictors of anxiety level in mental health. In this study, SOM and positive thoughts (large effect) predicted depression level, but negative thoughts (small effect) predicted depression level. This suggests that, next to more negative thoughts, less positive thoughts are a first indicator of elevated mental disorder in normal students. As anxiety levels and depression levels increase and reach the level of a mental disorder, negative thoughts may become more important and more interfering.

Finally, negative and positive thinking have directly opposite effects because they are negatively correlated. It is possible for one individual to have both types of thinking within a specific period of time. However, individuals with high negative thinking do have low positive thinking and vice versa.

Nonclinical Implications

This study suggests that a lack of positive thoughts may be more than an epiphenomenon of anxiety. Although more research is needed, it cannot be ruled out that a lack of positive thoughts is equally important in the development or manifestation of an excessive amount of negative thoughts. It should be noted, however, that this study was correlational and that the authors did not assess the temporal precedence of positive and negative thinking, depression, and anxiety.

The PNT hypothesis supposes that psychopathology is associated with more negative but not less positive thoughts, and it also predicts that good mental health is associated with a reduction of negative thoughts rather than an increase in positive thoughts (Kendall, 1984). Based on the results of this study, restructuring negative thoughts and enhancing positive thoughts may both be important in improving mental health. On the other hand, enhancing positive thoughts may be more effective only in the prevention of depressive disorders because positive thoughts were predictive only of depression level in the study sample. It remains unclear whether both negative and positive thoughts are important mechanisms in improving mental health. Research in this area has not been exhaustive, especially in adults, but it is needed to clarify this issue.

To conclude, in this study a cognition questionnaire was used to simultaneously measure the amount of negative and positive thoughts in a sample of students. Negative and positive thoughts and their ratio all seem to be related to the level of mental health. However, negative thoughts and the SOM ratio are the strongest predictors of mental health levels in nonclinical students, whereas positive thoughts are related to lower levels of anxiety and depression. Future research should clarify which is most effective in improving mental health: restructuring negative thoughts, enhancing positive thoughts, or restricting

negative thoughts and enhancing positive thoughts. Furthermore, more research is necessary concerning the validity of the SOM model among students and adults.

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