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The Amelioration of Anxiety Sensitivity by Cognitive Defusion Techniques: A Focus on the Fear of Respiratory Symptoms*

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Anxiety sensitivity (AS) refers to the tendency to fear of anxiety-related sensations. Catastrophic interpretation of bodily sensation is the major characteristic of AS. Cognitive Defusion (CD), the key process of acceptance and commitment therapy, is to prevent suffering from one's own thoughts (i.e., Cognitive Fusion) and aims to make people aware that a thought is just a thought and a feeling is just a feeling. To investigate CD's effects on AS, this study focused on fear of respiratory symptoms (FRS), one of the sub-components of AS, and examined whether FRS can be conceptualized as Cognitive Fusion (CF) and whether CD can ameliorate FRS. Female college students who scored in the top 75 percentile or the bottom 25 percentile in their FRS scores were invited (28 people for each group) to participate in the experiment among 329 preliminary survey respondents. Two groups (high FRS and low FRS) showed significant differences in all scales related with CF. Afterwards, half of both groups were given CD intervention while the remaining were allotted into a control condition. After intervention, the changes of FRS and other measures measuring CF were analyzed. Results showed that CD decreased FRS and believability of a negative thought during a breath-holding task only in high FRS group, but increased willingness and breath-holding duration for both high and low FRS groups. In this regard, the present study suggests that even a short intervention, such as CD focusing on disconnecting a catastrophic thought process, can ameliorate AS.

Key words : Anxiety sensitivity, Cognitive fusion, Acceptance and commitment therapy, Catastrophic thought

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Anxiety sensitivity (AS) refers to the fear of anxiety-related symptoms. Reiss and McNally (1985) posited that AS results from the belief that such symptoms are signs of harmful consequences (e.g., impending heart attack, going crazy, or losing control). Previous studies have shown this catastrophic interpretation of bodily sensation is a key point in understanding AS (e.g., Keogh, Hamid, Hamid, & Ellery, 2004).

Such misinterpretations of bodily sensations are processed consciously and automatically. On a conscious level (measured by the Brief Body Sensations Interpretation Questionnaire), high AS people show more interpretation bias toward panic-related situations and have stronger panic-related self-schema than low AS people on an automatic processing level (Teachman, 2005). Furthermore, in Schneider and Schulte's (2008) study, automatic catastrophic cognitions were negatively correlated with the reduction of anxiety sensitivity after cognitive-behavioral treatment for panic disorder, and the correlation was independent to the strength of conscious catastrophic cognitions. In this regard, high AS people seem to have a pathogenic cognitive style.

Such a cognitive style could be explained by *cognitive fusion* (CF) from the perspective of the acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999). CF means being fused between an actual event and thoughts about it. For example, when a person with high anxiety sensitivity feels uncomfortable while breathing, he or she might think 'the feeling of being suffocated is not good', and then thoughts such as 'something that makes me feel uncomfortable is dangerous' and 'something dangerous could kill me' might sequentially occur. Afterwards, he or she would be frightened by these thoughts which are not distinguished with an actual event. From the relational frame theory (cf. Hayes, Barnes-Holems, & Roche, 2001) perspective from which ACT has developed, such a verbal process "can make the world of direct (nonverbal) contingencies (e.g., bodily sensations) far more aversive than it needs to be" (Blackledge, 2007, p.556), and it is automatically or unconsciously processed (Hayes et al., 1999).

Although it has been verified by some of the studies mentioned above that an interpretation bias of bodily sensation is the key to understanding AS, the characteristics of the bias itself needs to be understood more deeply, and it also needs to investigate different subcomponents of AS separately. Each subcomponent predicts a distinctive vulnerable characteristic, such as panic disorder, depression, and social phobia (Deacon & Abramowitz, 2006). Specifically, physical and cognitive concerns factors of AS are highly related with panic disorder, cognitive concerns factor correlates with depression, and social concerns factor is associated with social phobia (Naragon -Gainey, 2010).

To investigate the catastrophic cognitive

process of AS and to test the effects of CF-focused intervention on the process, this study focused on the major subcomponent of AS, the fear of respiratory symptoms (FRS: the first factor of the AS Index-Revised, Taylor & Cox, 1998). Investigating features of sub-factors could help understand AS more in-depth, and separately testing a sub-factor can make the advantage of having a homogeneous sample to verify effectiveness of a treatment more clearly. Also, after it is verified that whether FRS could be conceptualized as CF, CF-focused intervention dealing with catastrophic interpretation bias could be applied to ameliorate FRS and AS. However, a study focusing on only ameliorating catastrophic misinterpretation of AS has not yet been founded, even though previous studies using cognitive -behavioral therapy (CBT) with diverse interventions (Schmidt et al., 2007) have shown that AS could be reduced easily, even in a 30-minute session. A CF-focused intervention based on ACT might have advantages compared with traditional CBT. ACT is less preceptive and uses behavioral experiences pursuing cognitive changes so that it is less intrusive and rejective, especially for people with anxiety disorders (Eifert & Forsyth, 2005).

In ACT, diverse *cognitive defusion* (CD) techniques are used to break up CF in order to achieve emotional acceptance and willingness to do things previously avoided, yet deemed valuable. CD does not intend to change the content, form, or frequency of thoughts, but instead change the process of the thoughts. Thus, CD aims to 1) distinguish evaluations of an event from the actual event, 2) alter the undesirable functions of thoughts or private events by creating contexts where their unhelpful functions are diminished, and 3) eventually decrease the believability of, or attachment to, private events (Hayes et al., 1999). Recent empirical research using specific CD techniques have shown therapeutic effectiveness in reducing the impact of negative thoughts about the self (e.g., Healy et al., 2008; Masuda, Hayes, Sackett, & Twohig, 2004).

To find out the change of FRS and CF level, a breath-holding task and three self-report measures (*willingness* to face, *discomfort* with, and *believability* of catastrophic thought to anxiety-related symptoms during and after the task) were used, in addition to the AS Index-Revised (ASI-R, Taylor & Cox, 1998). This task evokes broadband cardio- respiratory sensations and the feeling of suffocation (Eifert & Forsyth, 2005), which are dealt with in the ASI-R. Breath-holding is a simple (requiring no equipment) method of inducing an endogenous increase in CO_2 (Nardi et al., 2006), and CO_2 is one of the most reliable panicogenic agents (Perna, Cocchi, Bertani, Arancio, & Bellodi, 1995). Also, AS is strongly related with a tendency to report greater panic, fear, and distress in response to such panicogenic challenges (Zvolensky, Eifert, & Lejuez, 2001).

In summary, this study first investigated

whether FRS can be conceptualized as a phenomenon of CF by comparing 1) CF levels, 2) self-relevant negative automatic thoughts, and 3) intensity of bodily sensations and fears between people with high FRS and people with low FRS. Second, it was planned to examine the effects of CD on the change of FRS by between (low vs. high FRS) subjects design comparing 1) FRS scores, 2) CF-related measures' (willingness, believability, & discomfort) scores after breath-holding, and 3) breath-holding duration. Also, the effects of CD were compared with the changes according to time-spending (i.e., control condition).

Method

Participants

In previous studies, women have generally higher AS levels, especially regarding physical concern, than men (e.g., Stewart, Taylor, & Baker, 1997). In this regard, only female participants were recruited to minimize variability caused by gender. This study employed two (individual difference) by two (intervention type) factorial design rather than comparable (e.g., traditional cognitive behavioral therapy) and control conditions considering limited availability of sub-clinical participants. In Noh's (2007) study, female college students with FRS scores above the 75th percentile of the mean were qualitatively different from the students below the 25th percentile in terms of cognitive and behavioral responses of physical sensations, so the current study used the same sampling criteria. The process of recruiting participants into the experiment was done by randomly selecting 28 people (LFRS) with 6 or less points (below the 25th percentile) and 28 people (HFRS) with 18 or greater points (above the 75th percentile) on their FRS scores among the initial 329 respondents to the ASI-R questionnaire (administered during psychology classes at a university in Seoul, Korea). This study was introduced to them with the title "measuring anxiety-related thoughts". The recruitment and experiments were conducted as a double-blinded design. Both groups were divided into 2 conditions: half of people in both groups were given CD intervention for approximately 30 minutes, and the other half were given a control treatment for the same duration. They were given 10,000 won for participating for a total of 100 minutes in the experiment. Low and high FRS groups were not significantly different in age, $t(55) = 2.89$, *ns*, ($M = 21.1$, $SD = 1.6$ vs. $M = 20.4$, SD = 1.7) and had no mental or physical disorders in the past 6 months.

Materials

AS-Related Measures

Anxiety Sensitivity Index-Revised(ASI-R; Taylor & Cox, 1998)

The ASI-R is a 36-item self-report instrument assessing the fear of anxiety-related sensations. It was developed specifically to assess the lower-order factors of the AS construct (Reiss & McNally, 1985). The ASI-R has a four-factor hierarchical structure, including (1) fear of respiratory symptoms, (2) fear of publicly observable anxiety reactions, (3) fear of cardiovascular symptoms, and (4) fear of cognitive dyscontrol (Taylor & Cox, 1998). Respondents indicated their level of agreement with each item on a 5-point scale, and total scores ranged from 0 to 144. The first factor (i.e., FRS), 12 items (the 1st to the 12th item) of the Korean version of the ASI-R (Kim et al., 2004), was employed to divide experiment groups and to examine the therapeutic effects of CD. Kim et al's study showed sound internal consistency: Cronbach's alpha coefficient of the entire items was .92, and test-retest reliability was high (r = .82) for a 3-week period. In this study, the internal consistency of entire items was .94, and that of FRS was .93.

Hyperventilation Checklist(HC: Schmidt & Telch, 1994)

The HC requires individuals to rate the intensity of bodily sensations and fear of them on 4-point scales ranging from 0 (*not at all*) to 3 (*very severe*). The items include various sensations, such as faintness, pounding heart, and fears about dying. The HC includes 2 "response bias" items; thus, total scores range from 0 to 42. This study used the Korean version of the HC (Noh, 2007). Internal consistency (Cronbach's alpha coefficient) was .84 in this study.

Breath-holding task and Breath-holding duration

This task was similar to that of McNally and Eke's (1996) study. As an indirect index of sensitivity to the build-up of carbon dioxide, the experimenter timed how long individuals could hold their breath (in seconds). They emptied their lungs, took a deep breath, and held it as long as possible. This procedure was repeated twice with a 2-minute break between the first and second attempts, and the longer of the two times were recorded as the best estimate of the individual's maximum breath-holding duration. Their first and second attempts were highly correlated, $r(56) = .85$, $p < .01$, thereby indicating the reliability of this measure.

CF-Related Measures

Avoidance and Fusion Questionnaire for Youth(AFQ-Y: Greco, Lambert, & Baer, 2008)

The AFQ-Y is a child-report measure of psychological inflexibility engendered by high levels of cognitive fusion and experiential avoidance. Consistent with the theory underlying the ACT, items were converged into a 17-item

scale. Although it is based on the survey results from children, we assumed that it could measure college students' cognitive fusion because the items ask about behaviors in school and with friends. This questionnaire was translated into Korean by one of the authors of this study and translated back into English by a bilingual speaker to control for changes of meaning. The score range was 17 to 85. Internal consistency was .87 in this study.

Automatic Thought Questionnaire-Negative (ATQ; Hollon & Kendall, 1980), and its' Believability Version (ATB)

The ATQ items consist of negative self -statements characterizing depressive thoughts (e.g., "I can't finish anything") and ask how often those thoughts occur. The ATQ includes 30 statements and has recently been shown to be a useful measure of frequency of automatic negative thoughts in both clinical and non-clinical populations (Chioqueta & Stiles, 2004). The ATB asks how much you believe the same statements as a fact. Eifert and Forsyth (2005) suggested that ATB could be used to measure CF. Also, ATQ and ATB were major indicators of psychological acceptance, which is directly related with CF, in Moon's (2006) study. The ATQ and ATB require respondents to rate the items on a 0-4 Likert scale. This study used the Korean version of the ATQ (Kwon & Yoon, 1994). The internal consistencies of both ATQ and ATB were .95 in the current study.

CF-Related Scales(Believability, Discomfort, and Willingness)

The current study involved measuring participants' reactions to the breath holding task, using three self-report Likert-type rating scales that assessed levels of believability, discomfort, and willingness associated with bodily sensation and breath-holding. The three self-report scales were chosen on the basis of their inclusion in previous ACT research (e.g., Masuda et al., 2004). Participants were asked to provide three ratings as follows: rating the extent to which they (1) found 'the strongest negative thought during breath -holding' believable (believability); (2) felt uncomfortable to the strongest negative thought during breath-holding (discomfort); and (3) were willing to do breath-holding again if practicing breath-holding can be helpful in overcoming fears of bodily sensations (willingnes s)[1]. All three rating scales were visual analogue scales, ranging from 0 (*not at all uncomfortable, believable, and willing*) to 100 (*extremely uncomfortable, believable, and willing*).

1) Participants first answered the question, "what was the strongest negative thought during breath-holding." The answers were different person to person; for example, "I felt like I am dying soon" or "I just felt stuffy." Afterwards, participants answered the three rating questions.

Intervention

Cognitive Defusion Treatment

According to the CD's process (cf. Hayes et al., 1999), this study gave participants CD rationale, which teaches limits of language in apprehending direct experiences. This rationale was based on the CD rationale of Keogh and Barnes-Holmes' (2006) study with one of the authors' permission and included the description of thought processes of AS. It explained the negative sides of human language and fused-thought processes. After reading the rationale, participants were given 3 CD interventions, which were based on the protocols of the ACT self-help workbook (Hayes, 2005) with the author's permission. They aimed to 1) undermine fusion between self and language, 2) undermine evaluation and automatic rule- governed functions of language, and 3) teach healthy distancing and nonjudgmental awareness, respectively. First, participants did the "say the word 'milk' as fast as you can" exercise, which was to repeat the word "juice"[1] for 30 seconds in order to do the first aim mentioned above and to have an insight to view a word just as a word. The participants also repeated another word for 30 seconds, which was extracted from the strongest negative thought that occurred when they had been doing breath-holding. The second exercise was "exploring the difference between descriptions and evaluations." It was for the second aim mentioned above and to make some distinctions between descriptions and evaluations about both external objects and internal events. Participants wrote down objective features of juice, followed by subjective feelings of it. Afterwards, they wrote down descriptions of bodily responses when they had been doing breath-holding, and then evaluations which had occurred during breath-holding. This took approximately 10 minutes. The third exercise was the "floating leaves on a moving stream." It was for the third aim mentioned above and to notice one's thoughts as they came into one's mind. Participants, closing eyes, were told to "imagine you are sitting beside a beautiful slow-moving stream watching the leaves float by", and then "each time a thought pops into your head, imagine that it is written on one of those leaves." In this study, it was added to the exercise to "put some words or thoughts about juice on the leaves and floating them away, but it was not necessary to try to think only about juice, and just float away words about anything, including negative words, gently and one by one." Afterwards, participants repeated the same exercise but dealt with "breath-holding" instead of juice This exercise took 10 minutes, so the total CD treatment took approximately 30 minutes.

Control Condition

Participants read an article about nutrition and health. They spoke aloud some part of the

1) Juice was employed because it provokes sensation more than milk (cf. Moon, 2006).

article for 1 minute and answered 4 questions about the article. Afterwards, they practiced meditation without any guiding statements for 10 minutes, the same length of time as the third exercise of the CD treatment.

Procedure

All participants individually visited two times with a one-week interval. On the first day, they randomly completed questionnaires among the AFQ-Y, ATQ, and ATB. Afterwards, they did the breath-holding task, and rated the CF-related three scales and the HC. On the second day, they were given a 30-minute intervention, and then did 'the breath-holding task and rating CF-related scales' and 'the ASI-R', in a random order. Finally, they were debriefed to the purpose of this study.

Results

CF-Related Measures

To examine indirectly the difference of CF levels between LFRS and HFRS, a simple one-way Analysis of Variance (ANOVA) was conducted. The mean scores of the AFQ-Y, ATQ, and ATB of HFRS were significantly greater than those of LFRS, $t(54) = 12.26$, $p < .01$, $t(54) = 6.78$, $p < .01$, and $t(54) = 24.49$, $p < .01$, respectively (Table 1).

Table 1. Mean(SD) Scores on Cognitive Fusion-Related Questionnaires

Measure	Group		t
	LFRS (n = 28)	HFRS (n = 28)	
AFQ-Y	37.88 (10.66)	48.07 (9.94)	12.26**
ATQ	29.21 (19.76)	43.81 (19.84)	6.78*
ATB	23.50 (15.59)	49.07 (20.39)	24.49**

*p<.05, **p<.01; LFRS = low fear of respiratory symptoms group; HFRS = high fear of respiratory symptoms group; AFQ-Y = Avoidance and Fusion Questionnaire for Youth; ATQ = Automatic Thought Questionnaire-Negative; ATB = Automatic Thought Questionnaire-Negative Believability Version

AS-Related Measure

To test whether the breath-holding task could evoke anxiety and bodily sensation and have a different effect on each group, the HC scores of LFRS and those of HFRS were compared by using the ANOVA. The mean score of HFRS (M = 15.43, SD = 6.10) was significantly greater than that of LFRS (M = 9.07, SD = 4.17), $F(1, 54) = 20.72$, $p < .01$. From this result, it was concluded that the breath-holding task is an appropriate task to differentiate FRS levels and to investigate the change of fearful responses of bodily sensations.

Treatment Effects

The treatment effects of CD on FRS were

analyzed by using a 2 (High FRS vs. Low FRS) X 2 (CD treatment vs. Control treatment) ANOVA. The dependent variable was calculated by subtracting pre-treatment FRS scores from post-treatment FRS scores. The two-way interaction between the FRS level and treatment condition was significant, $F(1, 52) = 12.37$, $p < .01$, η_p^2[1] $= .19$. To investigate the interaction between the FRS level and treatment condition, simple main effect of the FRS level on FRS was tested separating each treatment condition. In CD condition, the simple main effect of the FRS level was significant, $F(1, 26) = 44.30$, $p < .01$, $\eta_p^2 = .63$. In control condition, the simple main effect of the FRS level was not significant, $F(1, 26) = 3.68$, *ns*, $\eta_p^2 = .12$. That is, only in the CD condition, HFRS showed great decrease in FRS scores compared with LFRS. Also, main effects of the FRS level and treatment condition were all significant, $F(1, 52) = 9.74$, $p < .01$, $\eta_p^2 = .16$, and $F(1, 52) = 22.17$, $p < .01$, $\eta_p^2 = .30$, respectively. As shown in Figure 1, the scores of HFRS given CD showed the greatest decrease compared to the other groups (see Table 2).

The treatment effects of CD on believability were analyzed by using the same way mentioned above. The two-way interaction between the FRS level and the treatment condition was significant, $F(1, 52) = 5.07$, $p < .05$, $\eta_p^2 = .09$. In CD condition, the simple main effect of the FRS level was significant, $F(1, 26) = 6.25$, $p < .05$, $\eta_p^2 = .19$. In control condition, the simple main effect of the FRS level was not significant, $F(1, 26) = 1.28$, *ns*, $\eta_p^2 = .05$. That is, only in the CD condition, HFRS showed great decrease in believability scores compared with LFRS. The main effect of the treatment condition was also significant, $F(1, 52) = 7.97$, $p < .01$, $\eta_p^2 = .13$, but that of the FRS level was not significant, $F(1, 52) = 0.79$, *ns*, $\eta_p^2 = .02$. As shown in Figure 2, the believability scores of the high FRS group given CD showed the greatest decrease compared to the other groups (see Table 2).

The treatment effects of CD on discomfort were analyzed by using the same way mentioned

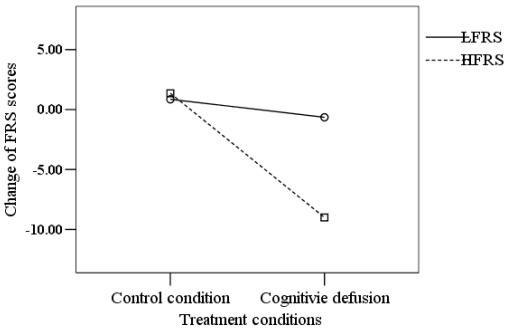

Figure 1. Change of FRS Scores After Each Treatment

(LFRS = low fear of respiratory symptoms group; HFRS = high fear of respiratory symptoms group)

1) Partial eta-squared is one of the index of effect size describing the "proportion of total variation attributable to the factor, partialling out (excluding) other factors from the total non-error variation" (Pierce, Block, & Aguinis, 2004, p. 918).

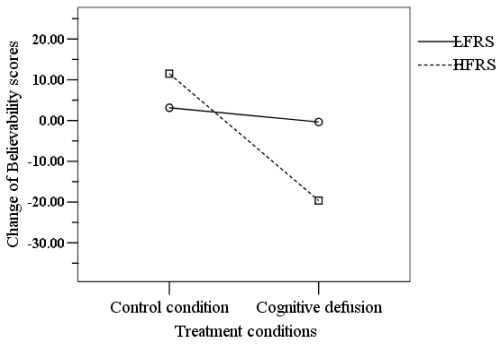

Figure 2. Change of Believability Scores After Each Treatment

(LFRS = low fearof respiratory symptoms group; HFRS = high fear of respiratory symptoms group)

above. The two-way interaction between the FRS level and the treatment condition was insignificant, $F(1, 52) = 2.63$, *ns*, $\eta_p^2 = .05$. Also, main effects of the FRS level and treatment condition were all insignificant, $F(1, 52) = 3.12$, *ns*, $\eta_p^2 = .06$, and $F(1, 52) = 2.08$, *ns*, $\eta_p^2 = .04$, respectively (see Table 2).

The treatment effects of CD on willingness were analyzed using the same 2 X 2 ANOVA mentioned above. The two-way interaction between the FRS level and the treatment condition was not significant, $F(1, 52) = 0.30$, *ns*, $\eta_p^2 = .01$. The main effect of the FRS level was also insignificant, $F(1, 52) = 1.05$, *ns*, $\eta_p^2 = .02$; however, that of the treatment condition was significant, $F(1, 52) = 10.53$, $p < .01$, $\eta_p^2 = .17$. Thus, it seems that CD increased

Table 2. Mean(*SD*) Fear of Respiratory Symptoms and Fusion-Related Scores, and Breath-Holding Duration Before and After Intervention

Measure		Group			
		LFRS		HFRS	
		Cognitive defusion (*n*=14)	Control condition (*n*=14)	Cognitive defusion (*n*=14)	Control condition (*n*=14)
Fear of respiratory symptoms	pre	15.64 (2.13)	15.79 (1.89)	33.86 (4.52)	34.79 (2.69)
	post	15.00 (2.42)	16.64 (3.65)	24.86 (5.52)	36.14 (6.79)
Believability	pre	28.21 (19.77)	30.36 (20.80)	44.29 (24.40)	40.36 (23.73)
	post	27.86 (23.84)	33.50 (25.70)	24.64 (13.37)	51.86 (28.24)
Discomfort	pre	27.86 (23.91)	37.14 (23.91)	56.79 (23.66)	57.64 (23.32)
	post	26.43 (25.22)	34.64 (29.93)	35.36 (15.50)	54.29 (27.09)
Willingness	pre	62.71 (30.30)	56.29 (33.91)	50.43 (26.94)	51.43 (28.14)
	post	65.93 (27.42)	45.79 (36.98)	61.64 (23.89)	43.36 (25.03)
Breath-holding duration	pre	70.29 (24.18)	70.93 (17.14)	64.07 (13.23)	67.21 (34.07)
	post	70.14 (20.06)	70.71 (19.14)	76.07 (18.55)	69.43 (31.26)

LFRS = low fear of respiratory symptoms group; HFRS = high fear of respiratory symptoms group

willingness regardless of FRS levels (see Table 2).

The treatment effects of CD on breath-holding duration were analyzed by using the same 2 X 2 ANOVA mentioned above. The two-way interaction between the FRS level and the treatment condition was not significant, $F(1, 52) = 2.27$, *ns*, $\eta_p^2 = .04$. The main effect of the FRS level was also insignificant, $F(1, 52) = 2.34$, *ns*, $\eta_p^2 = .04$; however, the main effect of the treatment condition was significant, $F(1, 52) = 5.11$, $p < .05$, $\eta_p^2 = .09$. Thus, it seems that CD increased breath-holding duration regardless of FRS levels (see Table 2).

Discussion

This study's aim was to investigate the effects of CD on AS. Accordingly, it was examined whether FRS, a major subcomponent of AS, could be conceptualized as CF. According to the level of FRS, the levels of cognitive fusion (AFQ-Y), negative automatic thought (ATQ), and believability of negative automatic thought (ATB) were compared. The results showed significant differences between HFRS and LFRS. In this regard, it is possible to conclude that FRS can be explained as CF, at least in part.

To investigate CD's effects on AS, the changes of FRS and fusion-related scales (believability, discomfort, and willingness) scores and of breath-holding duration were tested by using a 2 (treatment conditions) X 2 (FRS levels) factorial design. The results showed that CD decreased FRS and Believability, and regardless of FRS levels, increased willingness to experience the breath-holding task again and actual willingness to bear negative feelings. However, it should be cautious to interpret these results because CD affected both HFRS and LFRS to increase their willingness and breath-holding duration, but there were no changes in discomfort in both group.

However, from those results, it could be assumed that decreasing believability of negative thoughts about bodily sensation in HFRS leads to the increase in willingness and duration of breath-holding (this is also supported by the result that LFRS without high believability showed the increase in willingness and breath-holding after given CD intervention) and also helps to reduce the fear of respiratory symptoms. The increased duration, in spite of unchanged discomfort during breath-holding, might indicate psychological acceptance was indeed enhanced (cf. Campbell-Sills, Barlow, Brown, & Hofmann, 2006). This is consistent with the goal and process which CD pursues in the ACT (see Hayes et al., 1999). That is, acquiring the ability to view a thought as a thought and a feeling as a feeling increases psychological acceptance and willingness to do things for a valuable goal. In this respect, it can be concluded that catastrophic interpretation (reflected on believability) of bodily sensation may be the key to understanding FRS, and that

catastrophic interpretation may be constituted of the misbelief that a specific bodily sensation is a sign of harmful consequences. However, these speculations need more empirical evidence.

The effects of CD intervention on believability and willingness in the current study were concurrent with the results of Masuda et al. (2004) study (decrease in believability to negative thoughts about the self after repeating self-referential negative words) as well as with the results of Healy et al.'s (2008) study (increase in willingness to read and think about a self-referential negative statement after a cognitive distancing exercise). Interestingly, the result of the present study was different from those of the two studies which showed decrease on the discomfort measure. Because the second exercise of the CD in the present study emphasized that a feeling is just a feeling, participants might report discomfort to the similar extent to the report before the CD treatment. Thus, given that willingness (the goal of CD) was enhanced, the treatment effects of CD in the previous and present studies seem to be similar.

Meanwhile, there were limitations of this study to interpret the results and to generalize them. First, all of the measurements were self-reports. Despite 2 x 2 factorial design, it could not be guaranteed that demand characteristics or agreeableness of HFRS (Naragon-Gainey, 2010) did not interact with the treatment effects of CD. Second, although the effectiveness was found, follow-up measures are needed to verify the effectiveness. Third, generalization of the results has limitations due to sampling only female college students and recruiting participants above 75th and below 25th percentile of population. Fourth, on some measures, expected changes did not occur; that is, discomfort, willingness, and time of breath-holding were not indicative of the effectiveness of CD on FRS. Though the speculation of non-significant or no changes in those variables is plausible according to the previous studies, replication of this trial would clarify the mechanism of change in FRS and other relevant variables. Fifth, the measures used to find treatment effects and the change of catastrophic interpretation were infirm. As one of the reviewers mentioned, the independent and dependent variables were defined and measured by the same scale, FRS. In order to verify the change of the interpret ation bias, other reliable measures of catastrophic interpretation should have been used even though the measure of believability detected the change of misbelief. Finally, it would be better for further studies to employ another comparable condition (e.g., traditional cognitive behavioral therapy or psychoeducational treatment) to test efficacy of CD treatment.

This study may contribute to understand the concept of the cognitive aspect of AS by examining that the major sub-factor of AS can be explained as CF. Also, it has an implication

to panic disorder. Panic disorder is predicted by AS (Schmidt, Zvolensky, & Maner, 2006), and accounted for by panicogenic cognitive processes (Clark, 1986). Because FRS highly correlates with panic and agoraphobia scale, and panic disorder patients have higher scores of FRS than other patients with different anxiety disorders (Deacon & Abramowitz, 2006), a CD focused therapy would benefit people with panic disorder.

Moreover, by verifying the therapeutic impact of CD, the current study may help empirically confirm the effectiveness of the core process of the ACT, which is widely applied in clinical fields. Though the clinical effectiveness of ACT has been verified in many studies (see Hayes, Luoma, Bond, Masuda, & Lillis, 2006), studies which investigate the clinical usefulness of CD without other processes of the ACT are few. Also, this study is the first empirical investigation to demonstrate that CD alone can reduce an avoidant behavior. Furthermore, this study showed a similar result that even a very short intervention can ameliorate AS, which was previously reported in Schmidt et al.'s (2007) study. In this regard, this study suggests a short-term intervention for AS to help prevent a more severe mental illness.

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인지적 탈융합 처치를 통한 불안민감성 감소: 호흡계 증상에 대한 두려움을 중심으로

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불안민감성은 불안 증상 자체에 대해 공포를 느끼는 것으로, 이는 신체적 감각에 대해 파국적으로 해석하는 경향성에 주로 기인한다. 인지적 탈융합은, 새로운 인지행동치료법 중 하나인 수용 및 전념 치료의 핵심 요소로서, 자신의 생각으로 심리적 고통을 초래하는 일(인지적 융합)을 막는 것으로, '생각은 생각, 느낌은 느낌일 뿐'임을 자각하게 하는 것을 목표로 한다. 본 연구는 인지적 탈융합 처치가 불안민감성에 미치는 영향을 살펴보고자 불안민감성의 하위 요인인 호흡계 증상에 대한 두려움(FRS)에 초점을 맞추어, FRS가 인지적 융합의 개념으로 볼 수 있는지, 그리고 인지적 탈융합이 FRS를 감소시킬 수 있는 지를 확인하였다. 329명의 여자 대학생들을 대상으로 한 예비조사에서 FRS점수가 상위 및 하위 25%이내인 이들(각각 28명)을 실험참여자로 모집하였고, 다시 각 집단에서 절반은 탈융합 처치조건에, 나머지 절반은 통제조건에 할당한 뒤, 개별 피험자에게 30여 분간 인지적 융합 관련 설문지들과 실험조건에 따른 처치를 실시하였다. 그 결과, FRS점수 상위 집단이 하위 집단에 비해 모든 인지적 융합 관련 척도에서 유의미하게 높은 점수를 보였다. 탈융합 처치는 FRS상위 집단에게만 FRS점수와 숨참기 과제 동안의 부정적 사고에 대한 믿음을 감소시켰으나, FRS점수 상하위 집단 모두에서 숨참기 과제를 다시 할 의향과 숨참기 시간을 증가시켰다. 이러한 점에서, 본 연구는 파국적인 사고 과정을 깨는 데 초점을 맞춘 인지적 탈융합과 같은 단기간의 처치가 불안민감성을 감소시킬 수 있을 것으로 제언한다.

주요어 : 불안 민감성, 인지적 융합, 수용 및 전념 치료, 파국적 사고