FRENCH VALIDATION OF THE ATTENTIONAL CONTROL SCALE : FACTOR STRUCTURE AND RELATIONSHIPS WITH SYMPTOMS OF ANXIETY AND DEPRESSION

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A large body of evidence have shown that patients with anxiety and mood disorders selectively attend to negative or threatening information (Schoorl, Putman, & Van Der Does, 2013). This increased processing of negative information may reinforce and maintain symptoms over time (Cisler & Koster, 2010). Several models have been proposed in order to explain the underlying cognitive processes of those attentional biases (Schoorl, Putman, Van Der Werff, & Van Der Does, 2014a). The Attentional Control Theory (Eysenck, Derakshan, Santos, & Calvo, 2007) postulates that anxiety affects the executive processes of inhibition and flexibility, leading to the predominance of negative information (worrying thoughts, threat, etc.), even though this information is not relevant for the ongoing task. Specifically, individuals with low attentional control have been found to get easily distracted by emotional irrelevant information (e.g. decreased inhibition) and are enable to return to the main task (e.g. decreased flexibility). Impaired attentional control abilities have been linked to many clinical features of anxiety-related disorders such as worry, rumination, intrusive thoughts (Fox, Dutton, Yates, Georgiou, & Mouchlianitis, 2015; Hallion, Tolin, Assaf, Goethe, & Diefenbach, 2017), emotion regulation and distress tolerance (Bardeen, Tull, Dixon-Gordon, Stevens, & Gratz, 2015), obsessive compulsive disorders (Bradley et al., 2016) and pediatric anxiety (Wauthia & Rossignol, 2016). This vast amount of studies showed that attentional control may play an important role in our understanding of psychopathology. The Attentional Control Scale (ACS, Derryberry & Reed, 2002) is a 20 items self-reported questionnaire conceived to measure those two attentional processes. Authors have therefore conceived two subscales : the first one, labelled "Focusing" is represented by 9 items and assess the ability to maintain attention while inhibiting attentional distractors.

The second one, labelled "Shifting" is represented by 11 items and evaluates the ability to move attention from one task to the other (Judah et al., 2013). Items (e.g., "*It's very hard for me to concentrate on a difficult task when there are noises around*"; "*I can quickly switch from one task to another*") are answered on a 4-point Likert scale ranging from A (*almost never* = 1) to D (*always* = 4). A total score can be computed and tend to represent the global ability of an individual to consciously guide its attention toward one target among the environment without being distracted by irrelevant information, higher scores reflecting better attentional control abilities. Even though the ACS has been largely used in order to assess executive processes of attentional control, this scale has not yet been translated and validated in French.

The current study addressed this issue and investigated the psychometric properties of a French version of the ACS (F-ACS). In order to replicate previous research, we divided our study into three steps. First, we excluded items presenting weak correlations with others. Second, we explored the factor structure of the F-ACS using an exploratory factor analysis. We expected a two-factor model similar to those reported by Ólafsson (2011) and Judah (2013). Third, we explored the relationships between F-ACS and symptoms of depression and anxiety by performing hierarchical regression analyses. In line with previous studies (Judah, Grant, Mills, & Lechner, 2013; Ólafsson et al., 2011; Reinholdt-Dunne, Mogg, & Bradley, 2013), we expected (1) the Beck Depression Inventory to be associated with the Shifting subscale of the ACS and (2) the trait anxiety as measured by the STAI to be associated with Focusing subscale of the F-ACS.

In the present study, 217 individuals completed an online version of the F-ACS, the State-Trait anxiety Inventory (STAI, Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) and the Beck Depression Inventory (BDI, Beck & Beck, 1972). The sample consisted of 156 females (71.9%) and 61 males (28.1%). The average age was 29.9 (SD = 10.84).

First, correlations between individual items were investigated. Correlation analyses revealed that most of the items presented highly significant positive correlations (p-values < 0.05). However, theitem 9 ("*When concentrating I ignore feelings of hunger or thirst*") did not significantly correlate with 17 of the items (p-values > 0.10) and had significant but weak correlations (r = 0.14, 0.20 and 0.16, p-values < 0.05) with the remaining three items of the scale. Item 20 ("*It is hard for me to break from one way of thinking about something and look*

at it from another point of view") did not have a significant correlation with 15 of the items (p-values > 0.10) and had significant but weak correlations (r = 0.15, 0.16 and 0.19, p-values < 0.05) with the remaining five items of the scale. Given that items with weak or non-significant correlations with other items tend to perform poorly in a factor analysis (Costello & Osborne, 2005), they were not included in the remaining analysis. The remaining 18 items presented a Kaiser-Meyer-Oklin value of 0.824 and a Bartlett score of .000, which makes a factor analysis on those data an appropriate computation method.

Second, evaluation of the scree plot suggested that two factors should be extracted and parallel analysis (Horn, 1965) considered a three factors solution. Principal axis factoring was used to evaluate both options. In accordance with previous studies (Ólafsson, 2011; Judah, 2013) and in regard to factor interpretation, the two factor model was adopted. The first factor explained 27.67% of the ACS variance; item 7 ("*When trying to focus my attention on something, I have difficulty blocking out distracting thoughts*") and item 1 ("I*t's very hard for me to concentrate on a difficult task when there are noises around*") had the largest factor loadings on the first factor. A total of 10 items loaded on this factor, and each described the "Focusing" abilities, meaning the capacity to focus attention in the presence of distractors. The second factor explained 11.83% of the ACS score variance; item 19 ("*It is easy for me to alternate between two different tasks*"), had the largest factor loading. Each of the 7 items which loaded on this factor described the "Shifting" dimension that is the ability to switch attentional focus between tasks. Those two factors are in line with previous research (Derryberry & Reed, 2002; Ólafsson et al., 2011). The standardized factor loadings in this model are presented in Table 1. Internal consistency of the total score (α = 0.83) and the focusing factor (α = 0.84) were good and the shifting factor was reasonable (α = 0.71). The two subscales highly correlated (r = .316, p < 0.001) with each other.

Third, relationships between F-ACS and symptoms of depression and anxiety were explored. Our analyses showed that focusing and shifting factors of the ACS had high and negative correlations with symptoms of depression ($r_{focusing}$= −0.29; p = 0.01 and $r_{shifting}$ = −0.307; p < 0.001) and with state anxiety symptoms ($r_{focusing}$ = −0.234 and $r_{shifting}$ =−0.265, p < 0.005). Only focusing factor of the ACS had a high negative correlation with trait anxiety symptoms (r = −0.361; p < 0.001). These results indicate that anxiety and depression are associated with a decreased ability to focus and shift attention, which is in line with previous studies (Judah, Grant, Mills, & Lechner, 2013; Ólafsson et al., 2011; Reinholdt-Dunne, Mogg, &

Bradley, 2013). Since scores on the anxiety (state and trait) and depression scales were strongly correlated (respectively $r = 0.523$ and $r = .528$, $p < 0.001$), additional hierarchical regression analyses were conducted to investigate if the ACS subscales are differentially related these types of symptoms. Results (Table 2) revealed that when controlling for depression levels and demographics, the focusing subscale of the ACS makes a significant contribution ($p < 0.01$) in the predicting model of trait-anxiety scores and when controlling for anxiety levels and demographics, the shifting subscale of the ACS makes a significant contribution ($p < 0.01$) in the predicting model of depression scores

In conclusion, the present study supports a factor structure of the Attentional Control Scale in a French speaking population. We empirically replicated the two factor construct of the English version. Our next step is to run a confirmatory factor analysis in order to validate the present model. Second, we highlighted specific relations the F-ACS subscale and symptoms of depression and anxiety since "focusing" appeared to be associated with symptoms of anxiety while ''shifting'' from negative information was linked with depressive symptoms. This is congruent with literature regarding the presence of cognitive biases for threatening cues in anxiety disorders and depression (Cisler & Koster, 2010; Gollan et al., 2016; Schoorl, Putman, Van Der Werff, & Van Der Does, 2014b). Therefore, this scale offers a precise assessment of differentials executive processes, and provides concrete everyday life examples of the impact of rumination and attentional bias in a psychoeducation goal.

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Table 1

Results from the two-factor solution exploratory factor analysis (EFA) of the Attentional Control Scale items

Description of item content		EFA results (n = 217)		
		I	II	h^2
7	When trying to focus my attention on something, I have difficulty blocking out distracting thoughts	**.778**	.014	.60
1	It's very hard for me to concentrate on a difficult task when there are noises around	**.758**	.094	.58
6	When I am reading or studying, I am easily distracted if there are people talking in the same room	**.724**	.039	.53
3	When I am working hard on something, I still get distracted by events around me	**.721**	.006	.52
5	When concentrating, I can focus my attention so that I become unaware of what's going on in the room around me	**.699**	.199	.53
2	When I need to concentrate and solve a problem, I have trouble focusing my attention	**.666**	.197	.48
18	When a distracting thought comes to mind, it is easy for me to shift my attention away from it	**.513**	.119	.28
11	It takes me a while to get really involved in a new task	**.494**	.277	.32
8	I have a hard time concentrating when I'm excited about something	**.485**	.079	.24
4	My concentration is good even if there is music in the room around me	**.447**	.119	.21
19	It is easy for me to alternate between two different tasks	.063	**.738**	.54
10	I can quickly switch from one task to another	-.030	**.695**	.48
17	After being interrupted or distracted, I can easily shift my attention back to what I was doing before	.350	**.595**	.48
15	I have trouble carrying on two conversations at once	.111	**.561**	.33
13	I can become interested in a new topic very quickly when I need to	-.021	**.526**	.28
16	I have a hard time coming up with new ideas quickly	.184	**.522**	.31
12	It is difficult for me to co-ordinate my attention between the listening and writing required when taking notes during lectures	.254	**.439**	.26
14	It is easy for me to read or write while I'm also talking on the phone	.065	**.363**	.14

Note : h^2 = communality. Pattern matrix is shown with oblimin rotation and loadings of 0.30 or greater in bold.

Table 2

Results from two hierarchical regression analyses using focusing and shifting subscales of the ACS to predict anxiety and depression scores (n = 217).

	B	SE B	β	t
Dependent Variable : Depression				
Step 1 (ΔR^2 = .04)*				
Gender	-1.113	1.013	-.096	-1.099
Age	-.084	.039	-.189	-2.16*
Step 2 (ΔR^2 = .29)***				
Anxiety	.188	.028	.532	6.598 ***
Step 3 (ΔR^2 = .35)***				
ACS Focusing	-.001	.083	-.001	-.010
ACS Shifting	-.322	.107	-.244	-2.998 **
Dependent Variable : Anxiety				
Step 1 (ΔR^2 = .125)***				
Gender	-10.17	2.74	-.31	-3.71***
Age	-.206	.105	-.16	-1.96
Step 2 (ΔR^2 = .351)***				
Beck Depression	1.38	.21	.49	6.59 ***
Step 3 (ΔR^2 = .38)***				
ACS Focusing	-.57	.224	-.209	-2.529 **
ACS Shifting	.264	.306	.071	.863

Note : * p < 0.05

  ** p < 0.01

  *** p < 0.001

BIBLIOGRAPHY

Badura-Brack, A. S., Naim, R., Ryan, T. J., Levy, O., Abend, R., Khanna, M. M., … Bar-Haim, Y. (2015). Effect of Attention Training on Attention Bias Variability and PTSD Symptoms: Randomized Controlled Trials in Israeli and U.S. Combat Veterans. *American Journal of Psychiatry*, *172*(12), 1233–1241. https://doi.org/10.1176/appi.ajp.2015.14121578

Bardeen, J. R., Tull, M. T., Dixon-Gordon, K. L., Stevens, E. N., & Gratz, K. L. (2015). Attentional Control as a Moderator of the Relationship Between Difficulties Accessing Effective Emotion Regulation Strategies and Distress Tolerance. *Journal of Psychopathology and Behavioral Assessment*, *37*(1), 79–84. https://doi.org/10.1007/s10862-014-9433-2

Beck, A. T., & Beck, R. W. (1972). Screening depressed patients in family practice. A rapid technic. *Postgrad Med*, *52*, 81–85.

Bradley, M. C., Hanna, D., Wilson, P., Scott, G., Quinn, P., & Dyer, K. F. W. (2016). Obsessive–compulsive symptoms and attentional bias: An eye-tracking methodology. *Journal of Behavior Therapy and Experimental Psychiatry*, *50*, 303–308. https://doi.org/10.1016/j.jbtep.2015.10.007

Cisler, J. M., & Koster, E. H. W. (2010). Mechanisms of attentional biases towards threat in anxiety disorders: An integrative review. *Clinical Psychology Review*, *30*(2), 203–216. https://doi.org/10.1016/j.cpr.2009.11.003

Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation*, *10*(7), 1–9.

de Voogd, E. L., Wiers, R. W., Prins, P. J. M., de Jong, P. J., Boendermaker, W. J., Zwitser, R. J., & Salemink, E. (2016). Online attentional bias modification training targeting anxiety and depression in unselected adolescents: Short- and long-term effects of a randomized controlled trial. *Behaviour Research and Therapy*, *87*, 11–22. https://doi.org/10.1016/j.brat.2016.08.018

Derryberry, D., & Reed, M. A. (2002). Anxiety-related attentional biases and their regulation by attentional control. *Journal of Abnormal Psychology*, *111*(2), 225–236. https://doi.org/10.1037//0021-843X.111.2.225

Fox, E., Dutton, K., Yates, A., Georgiou, G. A., & Mouchlianitis, E. (2015). Attentional Control and Suppressing Negative Thought Intrusions in Pathological Worry. *Clinical Psychological*

Science, *3*(4), 593–606. https://doi.org/10.1177/2167702615575878

Gollan, J. K., Hoxha, D., Hunnicutt-Ferguson, K., Norris, C. J., Rosebrock, L., Sankin, L., & Cacioppo, J. (2016). Twice the negativity bias and half the positivity offset: Evaluative responses to emotional information in depression. *Journal of Behavior Therapy and Experimental Psychiatry*, *52*, 166–170. https://doi.org/10.1016/j.jbtep.2015.09.005

Hallion, L. S., Tolin, D. F., Assaf, M., Goethe, J., & Diefenbach, G. J. (2017). Cognitive Control in Generalized Anxiety Disorder: Relation of Inhibition Impairments to Worry and Anxiety Severity. *Cognitive Therapy and Research*, *41*(4), 610–618. https://doi.org/10.1007/s10608-017-9832-2

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, *30*, 179–185. https://doi.org/10.1007/BF02289447

Judah, M. R., Grant, D. M., Mills, A. C., & Lechner, W. V. (2013). Factor structure and validation of the attentional control scale. *Cognition and Emotion*, *28*(3), 433–451. https://doi.org/10.1080/02699931.2013.835254

Ólafsson, R. P., Smári, J., Guðmundsdóttir, F., Ólafsdóttir, G., Harðardóttir, H. L., & Einarsson, S. M. (2011). Self reported attentional control with the Attentional Control Scale: Factor structure and relationship with symptoms of anxiety and depression. *Journal of Anxiety Disorders*, *25*(6), 777–782. https://doi.org/10.1016/j.janxdis.2011.03.013

Reinholdt-Dunne, M. L., Mogg, K., & Bradley, B. P. (2013). Attention control: Relationships between self-report and behavioural measures, and symptoms of anxiety and depression. *Cognition & Emotion*, *27*(3), 430–440. https://doi.org/10.1080/02699931.2012.715081

Schoorl, M., Putman, P., Van Der Werff, S., & Van Der Does, A. J. W. (2014). Attentional bias and attentional control in Posttraumatic Stress Disorder. *Journal of Anxiety Disorders*, *28*(2), 203–210. https://doi.org/10.1016/j.janxdis.2013.10.001

Spielberger, C. ., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the state-trait anxiety inventory (form Y): Self-evaluation questionnaire*. Palo Alto, CA: Consulting Psychologists Press.

Wald, I., Bitton, S., Levi, O., Zusmanovich, S., Fruchter, E., Ginat, K., … Bar-Haim, Y. (2017). Acute delivery of attention bias modification training (ABMT) moderates the association between combat exposure and posttraumatic symptoms: A feasibility study. *Biological Psychology*, *122*, 93–97. https://doi.org/10.1016/j.biopsycho.2016.01.005

Wauthia, E., & Rossignol, M. (2016). Emotional Processing and Attention Control Impairments in Children with Anxiety: An Integrative Review of Event-Related Potentials Findings. *Frontiers in Psychology*, *7*. https://doi.org/10.3389/fpsyg.2016.00562

Ziaee, S. S., Fadardi, J. S., Cox, W. M., & Yazdi, S. A. A. (2016). Effects of attention control training on drug abusers' attentional bias and treatment outcome. *Journal of Consulting and Clinical Psychology*, *84*(10), 861–873. https://doi.org/10.1037/a0040290

VALIDATION FRANÇAISE DE L'ÉCHELLE DE CONTRÔLE ATTENTIONNEL : STRUCTURE FACTORIELLE ET LIENS AVEC LES SYMPTÔMES D'ANXIÉTÉ ET DE DÉPRESSION

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De nombreuses évidences cliniques et empiriques ont démontré que individus atteints de syndromes dépressifs et anxieux privilégiaient les informations négatives et / ou menaçantes. La théorie dite du contrôle attentionnel a permis de décomposer ce phénomène en deux processus cognitifs : premièrement, une difficulté à inhiber les informations émotionnelles, et deuxièmement une incapacité à déplacer son attention sur une autre information de l'environnement. L'Échelle de Contrôle attentionnel, un auto-questionnaire de 20 items, a été conçu afin d'évaluer séparément ces deux processus en les situant dans des contextes écologiques. Cependant, aucune version française de ce questionnaire n'avait été validée jusqu'à présent.