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French Validation of the Overexcitability Questionnaire 2: Psychometric Properties and Factorial Structure

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Overexcitability corresponds to an overall response to stimulations in 5 domains: psychomotor, sensual, intellectual, imaginational, and emotional. The aim of this study was to develop a French version of the Overexcitability Questionnaire 2 (OEQ2) and to expand its psychometric properties. Two studies were conducted: one with a sample of 474 adolescents and another with a sample of 436 adults. Internal consistency, factorial structure, and validity (correlations with intelligence, personality, and alexithymia) were examined. The French OEQ2 showed satisfactory psychometric properties, thus advocating for its use in further research on overexcitability and in clinical practice.

Dabrowski (1964) introduced the theory of positive disintegration (TPD) and the related concept of overexcitability (OE[1]). The TPD consists of a five-level hierarchical theory of personality development. According to Dabrowski, the intensity, the duration, and the frequency of life experiences are essential to the development of personality and talent (Piechowski & Colangelo, 1984). The main idea of the TPD is that personality structures change (disintegrate) over time to reach a higher level of development and that OE is one of several components that facilitate this process (Tillier, 2009). OE provokes inner conflicts, and their resolutions allow an individual to reach the next level of personality development. Bouchard (2004) clarified that, although these reactions can be potentially negative, crises are necessary to achieve a higher level of emotional and moral development (for an introduction to the TPD, see Ackerman, 2009; Mendaglio & Tillier, 2006; Tillier, 2009).

The Concept of Overexcitability

The Polish word *nadpobudliwosc,* translated as overexcitability (Dabrowski, Kawczak, & Piechowski, 1970), refers to the capacity to be superstimulated, in the neurological sense (Piechowski, 1999). It is "an innate tendency to respond with heightened intensity and sensitivity to intellectual, emotional, and other stimuli, also called psychic overexcitability" (p. 325). The characteristics of OE are (a) the reaction does

not necessarily depend on the stimulus, (b) sometimes the reaction can be stronger than the stimulus, (c) the reaction persists for a long time, and (d) the reaction is immediately processed by the sympathetic nervous system (accelerated heartbeat, perspiration).

The OE construct is easy to observe through psychosomatic indexes such as blushing, perspiration, shivering, physical tensions, or sensations of warmth or coldness. Emotions are experienced as positive or negative, but always as intense (Piechowski, 2006). Experiencing life intensely is a key condition to allow positive disintegration and thus personality structure changes (Ackerman, 2009).

OE is experienced in five domains (Dabrowski, 1972; Piechowski, 1991):

1. Psychomotor OE corresponds to the need to move, to be physically active, and to express a lot of energy. Individuals who score high on this OE domain have a heightened activity of their nervous system that could lead to impulsive behavior, nervous tics, gesticulation, vivid facial expression, or rapid speech.
2. Sensual OE refers to a heightened sensory experience. Individuals who score high on this OE are attracted to sensory experiences and appreciate art, music, and language (Lind, 2001). Piechowski (1979) explained that they like physical appearance and beauty, as well as touching, tasting, and smelling things.
3. Intellectual OE corresponds to a strong need to understand, to acquire knowledge, to search for truth, and to analyze information. People with high intellectual OE are curious and try to understand how things work. They observe and analyze things to generate new ideas and theories. They think quickly and persevere until they find an explanation. Thus, intellectual OE is not a measure of intelligence, but reveals an interest for analyzing complex problems (Ammirato, 1987).
4. Imaginational OE is characterized by creative thought, a strong ability to make detailed associations from images,

[1]When OE appears alone, it refers to the overall construct of overexcitability whereas when a name (e.g., Intellectual) precedes the OE, we are talking about a specific subscale. When we refer to the questionnaire, we mention OEQ.

the use of metaphors and analogies, vivid dreams, and the tendency to fantasize and invent ideas. Individuals who score high on this OE mix truth and fiction or develop their own imaginary world (Lind, 2001).

5. Emotional OE corresponds to the experience of intense emotional situations through a wide range of feelings, attachments, compassion, and heightened sense of responsibility. Individuals with high emotional OE also show a strong ability to recall affective memories.

DESCRIPTION AND RATIONALE OF THE OEQ2

The original Overexcitability Questionnaire (OEQ), developed by Piechowski (1979), included 21 open-ended questions across all OE domains. The first version of the questionnaire was very time-consuming because the answers had to be coded individually, reducing the interest of this scale for quantitative studies. Consequently, a second version of the OEQ was developed (OEQ2; Falk, Lind, Miller, Piechowski, & Silverman, 1999; Falk, Piechowski, & Piirto, 2000).

The OEQ2 is a 50-item questionnaire (10 items for each OE); participants answer using a 5-point Likert scale ranging from 1 (*not at all like me*) to 5 (*very like me*; Falk et al., 1999). The development of the questionnaire was based on published and unpublished data, including the use of some answers on the OEQ collected by Piechowski as items for the new questionnaire, the findings of an unpublished doctoral dissertation (Ammirato, 1987), and the Wilson–Barber Inventory of Childhood Memories and Imaginings (Myers, 1983). Items from the Affect Intensity Measurement questionnaire (AIM; Larsen, Diener, & Emmons, 1986) were also used to construct the Emotional OE subscale. Larsen and Diener (1985, 1987) defined affect intensity as the tendency to feel and experience emotional reactions as strong or extreme in a given emotional situation–a definition that perfectly fits the concept of Emotional OE. Initially, affect intensity was conceptualized as unidimensional, but analyses of the psychometric properties of the AIM revealed four dimensions: positive affectivity, negative intensity, negative reactivity, and serenity (Bryant, Yarnold, & Grimm, 1996; Simonsson-Sarnecki, Lundh, & Torestad, 2000; Weinfurt, Bryant, & Yarnold, 1994; Zenasni et al., 2003). Consequently, the OEQ2 differs from AIM by the unidimensional conception of the Emotional OE.

Factor Structure and Reliability

Initial psychometric investigations of the original English OEQ2 were conducted in two samples. In accordance with theoretical expectations, five components were identified through a principal component analysis, and internal consistency was good; Cronbach's alphas for each dimension were above the classical recommendation of .70 (Cronbach, 1951; Gable & Wolf, 1993; Nunnally, 1978; Peterson & Kim, 2013): Psychomotor $\alpha = .86$, Sensual $\alpha = .89$, Intellectual $\alpha = .89$, Imaginational $\alpha = .85$, and Emotional $\alpha = .84$. Falk et al. (1999) also reported descriptive statistics showing a normal distribution of the OE scores. However, Emotional OE had the smallest variance and slightly higher mean scores in comparison with other OE dimensions ($M = 3.72$, $SD = 0.77$, range = 1.72–5.00, skewness = −.45).

The correlations observed between the subscales suggested that the different OE dimensions are not independent. For example, Tieso (2007) tested a five-factor model in which the scales were allowed to correlate. Results of the confirmatory factor analysis revealed a moderate fit, $\chi^2(1130) = 1899.07$, $p < .001$, root mean square error o approximation (RMSEA) = .049, Goodness-of-Fit Index (GFI) = 0.79, comparative fit index (CFI) = 0.85.

In a Chinese sample, Siu (2010) observed moderate correlations between all the OE scales (mean $r = .32$, range = .23–.39), suggesting again a five-factor model in which the subscales are all intercorrelated. The internal consistency, although not as high as the English version, was acceptable (Psychomotor $\alpha = .81$, Sensual $\alpha = .85$, Intellectual $\alpha = .90$, Imaginational $\alpha = .77$, and Emotional $\alpha = .70$), and the factor structure of the Chinese OEQ2 had an acceptable fit, $\chi^2(1165) = 733.88$, $p < .01$, RMSEA = .05, GFI = .93, CFI = .89.

Overall, past research has supported the five-factor structure, although some questions were not systematically addressed. For example, it is unclear whether a second-order OE factor could account for correlations among the five factors. Concerning reliability, a recent meta-analysis (Warne, 2011) has shown that the reliability of the English OEQ2 was good to excellent, almost always close to .80. The rare exceptions are studies with small samples ($n < 100$) or with low variance of OE scores, such as Piirto, Montgomery, and May's (2008) study of the psychometric properties of the Korean version (Psychomotor $\alpha = .57$, Sensual $\alpha = .68$, Intellectual $\alpha = .68$, Imaginational $\alpha = .72$, and Emotional $\alpha = .66$).

Validity and Relation With Other Variables

Carman (2011) showed that the OEQ2 has good divergent validity with classical measures of intelligence and good convergent validity with another measure of sensory excitability. However, in another study, Wirthwein and Rost (2011) found the discriminative power of OEQ2 was moderate, although high-intelligence adults and high-achieving adults scored approximately 0.5 *SD* higher than average-intelligence adults and achievers on the Intellectual OE. Additionally, Mendaglio (2012) suggested that, according to the theory of positive disintegration, high intelligence does not predict any OE. Thus, the link between OE and intelligence appears complex.

The OE concept has been examined among academically gifted children (Piirto, Beach, Rogers, & Fraas, 2000; Yakmaci-Guzel & Akarsu, 2006) and gifted adults (Bouchet & Falk, 2001; Wirthwein & Rost, 2011). Although some studies found that gifted samples have higher OE than average samples (Bouchet & Falk, 2001; Piirto et al., 2000; Yakmaci-Guzel & Akarsu, 2006), OE does not seem sufficient to be used alone to identify giftedness (Mendaglio, 2012); rather, OE has to be combined with other variables to improve its predictive efficacy. For instance, such variables could be personality factors of the Five-factor model (e.g., John & Srivastava, 1999).

There are, however, to our knowledge, few studies directly addressing the question of the relation between OEQ2 and the Five-factor model. Altaras-Dimitrijevic (2012) investigated the personality profile differences between gifted and average

children within the Big Five framework, highlighting the links of these two conceptions of personality (Big Five and OE). She concluded that gifted students are "characterized by a combination of higher assertiveness, higher openness to ideas, fantasy, aesthetics, and feelings, but lower gregariousness, compliance, modesty, tender-mindedness, order, and deliberation" (p. 246). Based on these results and because gifted individuals score high on OE (Ackerman, 1997; Miller, Silverman, & Falk, 1994; Piechowski, 1999; Tucker & Hafenstein, 1997), it is reasonable to anticipate that some Big Five factors would be correlated with OE dimensions.

Although no previous studies have examined the relationship between OE and alexithymia, Dabrowski's (1964) TPD refers to emotional development (Ackerman, 2009), and examining the relationship of OE with alexithymia might be interesting. Indeed, alexithymia is a multidimensional concept that includes difficulties identifying and describing feelings, difficulties distinguishing feelings from bodily sensations, and an externally oriented thinking style that focuses on concrete aspects of life at the expense of emotional activities (Taylor, 1994; Taylor & Bagby, 2000). Alexithymia also corresponds to a difficulty experiencing feelings and is associated with a lack of imagination (Bermond, Bierman, Cladder, Moormann, & Vorst, 2010; Sifneos, 1973; Vermeulen, Luminet, & Corneille, 2006). Botella, Zenasni, and Lubart (2011) suggested that the alexithymia construct is the opposite of Emotional OE (i.e., very low or lack of overexcitability).

Gender Differences

Various individual differences in relation with OE have been investigated during the past several decades. For example, females score higher than males on Sensual and Emotional OEs (Ackerman, 1997; Bouchet & Falk, 2001; Gross, Rinn, & Jamieson, 2007; Miller et al., 1994; Tieso, 2007), whereas they score lower on Psychomotor and Intellectual OEs (Bouchet & Falk, 2001; Lysy & Piechowski, 1983; Miller et al., 1994; Rinn, Mendaglio, Moritz Rudasill, & McQueen, 2010; Tieso, 2007). The relationship between gender and Imaginational OE is less consistent; depending on the study, females have sometimes been found to score higher than males (Ackerman, 1997; Gross et al., 2007) and sometimes lower (Bouchet & Falk, 2001).

AIMS OF THIS STUDY

The OEQ2 has already been translated into several languages, such as Chinese (Siu, 2010), Turkish (Falk, Yakmaci-Guzel, Chang, Sanz, & Chavez-Eakle, 2008), and Korean (Piirto et al., 2008). In this context, the first aim of this study was to translate and adapt the OEQ2 into French and, notably, to test its psychometric properties. In particular, analyses focused on the OEQ2's reliability (internal consistency and temporal stability) and factor structure in preadolescents and adolescents and adult samples. As a second objective, convergent and divergent validity were examined in the relations between OE, Big Five personality factors, intelligence, and alexithymia. Finally, gender differences were examined.

Although OE has been mainly examined in gifted populations in previous work, we suggest that the OEQ2 could be

useful across other research domains, including studies of the general population. Tillier (2009), who tried to keep the TPD in line with the initial conception of Dabrowski, explained that Dabrowski "was not focused on 'genius' [... but on] exceptional personality development" (p. 123). Thus, even if OE is important for giftedness, it could be as important for the development of personality in the general population. Hence, we proposed that OEQ2 could be complementary to other personality assessments (e.g., the Big Five personality factor theory; John, Naumann, & Soto, 2008; McCrae & Costa, 1990). Moreover, compared to the AIM, the OEQ2 allows for a global measurement of life experiences (psychomotor, sensual, intellectual, and imaginational) in addition to the emotional aspect. Two studies were conducted. The common objective of both studies was to test the factorial structure of the French-language version of the OEQ2 and to provide evidence in favor of its validity. Based on previous studies discussed earlier, we expected a five-correlated-factor structure to be superior to two alternative structures: a five-uncorrelated-factors structure and a structure with a second-order factor loading on all five first-order factors.

The first study specifically explored psychometric properties of the scale in preadolescents and adolescents. We tested discriminant and construct validity of the OEQ2 by correlating it with intelligence, personality, and alexithymia measures. We expected (a) null or weak positive correlations between all the OEs and intelligence, (b) positive correlations of OE with Openness and Extraversion but negative correlations with Agreeableness and Conscientiousness, (c) negative correlations between OE and alexithymia, and (d) gender effects–females will score higher than males on Sensual and Emotional OEs but lower on Psychomotor and Intellectual OEs.

The second study examined psychometric properties of OEQ2 in young adults. Our aim was to compare and confirm results found in the first study and to demonstrate that the OEQ2 can be applied to children, adolescents, and adults from the general population. In this study, the construct validity with alexithymia was extended, using two different scales measuring the construct. As in Study 1, we expected negative correlations between alexithymia and OE, especially between Imaginational OE and the difficulty fantasizing factor, and between Emotional OE and the difficulty experiencing feelings factor.

PRESTUDY: FROM TEN ITEMS TO SEVEN ITEMS PER DIMENSION

Although we initially intended to translate and validate the full 50-item questionnaire (10 items for each OE dimension), we finally decided to propose a 35-item version (7 items for each dimension). The main reason for this is that initial analyses of the full version revealed poor model fit; in particular, all CFI in confirmatory analysis were below .80, which is far below the classical cutoff values of .90 or .95 (e.g., Hu & Bentler, 1999). To bring the model's fit to a more acceptable level, we could have freed an important number of cross-loadings and residual covariances, but we thought that it would be sounder to reduce the scale to its best and least redundant items. Moreover, we opted to eliminate certain items because

of the small factor loadings for certain items. In this case, we found that removing three items per scale was sufficient for our purposes.[2] We acknowledge that this method is data driven. However, as we had two very different samples, the risk of abusive item suppression should be limited–a weak item in the first sample was generally also weak in the second. Regardless, we think that research would generally benefit from shorter scales, and the safer way to do this is empirically.

STUDY 1

Method

Participants and data collection. The sample included 474 preadolescents and adolescents ($M = 12.33$ years, $SD = 1.18$, range = 10.0–16.5, 56% male). Participants were recruited in French middle schools in which we collected written authorization forms from parents. Measures were administered collectively in the classroom (20–30 participants per session). The participants had as much time as needed to complete the scale. Three researchers were present during the task, and participants could ask them if they had difficulties understanding some words. However, almost none of them asked for help.

Materials.

The French Overexcitability Questionnaire 2: The French OEQ2 includes 35 items evaluating five dimensions of OE on a 5-point Likert scale: Psychomotor (e.g., "If an activity is physically exhausting, I find it satisfying"), Sensual (e.g., "I feel music throughout my whole body"), Intellectual (e.g., "I am an independent thinker"), Imaginational (e.g., "When I get bored, I begin to daydream"), and Emotional (e.g., "I have strong feelings of joy, anger, excitement, and despair"). Each item is rated from 1 to 5; a high score on a given subscale indicates high OE. Scores for each dimension are calculated by averaging the 7 items per scale.

We used the back-translation method to create the French version of the OEQ2 (Brislin, 1970, 1980; Brislin, Lonner, & Thorndike, 1973; Geisinger, 1994; Werner & Campbell, 1970). First, a native French speaker, familiar with OE and fluent in English, translated the questionnaire from English to French. Second, two native English speakers, unfamiliar with OE, back-translated the questionnaire from French to English. Third, both English versions were compared and all translators discussed the translation together. Fourth, three researchers in psychology, unfamiliar with OE, completed and provided comments on the translation (Brislin, 1970; Brislin et al., 1973; Sechrest, Fay, & Zaidi, 1972). Finally, based on the researchers' comments, some minor changes were made to improve the meaning in French (Chen & Boore, 2009).

Naglieri Nonverbal Ability Test: The Naglieri Nonverbal Ability Test (NNAT; Naglieri, 1997, 2003) is a global intelligence measurement used with preadolescents and adolescents.

In this 40-item test (including two sample questions), participants have 30 min to examine a pattern and determine the right answer among five possibilities, according to the information given in the pattern. This test is recommended to test nonverbal reasoning and problem resolution. The global scores range from 0 to 38 corresponding to the sum of the correct answers, without considering the two examples. Then, the global score is converted into an IQ score ($M = 100$, $SD = 15$). A high score indicates good reasoning abilities. Using the Kuder–Richardson formula, reliability coefficients range between .81 and .88 (McCallum, Bracken, & Wasserman, 2001). The NNAT also predicts academic achievement (Balboni, Naglieri, & Cubelli, 2010). Convergent validity with academic knowledge tests has ranged between .32 and .63 (Naglieri, 1997).

Brief Big Five: The Five-factor model of personality was assessed with the Brief Big Five (BB5; Barbot, 2011). The BB5 evaluates five bipolar dimensions: Agreeableness (interpersonal tendency to be compassionate and friendly), Conscientiousness (tendency to show control and self-discipline), Extraversion (interpersonal tendency to be social and to search out external stimulations), Neuroticism (tendency to experience unpleasant emotions and to be emotionally unstable), and Openness (tendency to have active imagination, sensibility to aesthetics and emotions). This self-report measure is composed of 100 adjectives rated on a 5-point Likert scale. The score of each dimension varies between 18 and 90 and is computed by summing the answer of items corresponding to each dimension after rescoring negatively cued items. The factor structure has been confirmed in a sample of 3,544 adolescents, $\chi^2(80) = 1259.3$, $p < .001$, RMSEA = .068, adjusted GFI (AGFI) = 0.93, normed fix index = 0.94, and root mean square residual = 0.022. Cronbach's alpha values ranged between .75 and .86 (Barbot, 2011).

Toronto Alexithymia Scale: The Toronto Alexithymia Scale (TAS–20; Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994), validated in French (Loas, Parker, Otmani, Verrier, & Fremaux, 1997), includes 20 items rated on 5-point Likert scales ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Three factors that are assessed include (a) difficulty describing feelings (DDF), (b) difficulty identifying feelings (DIF), and (c) externally oriented thinking (EOT), with thoughts turned to concrete aspects of life at the expense of emotional aspects. The global score of alexithymia is calculated by adding all the factors, resulting in scores ranging from 20 to 100. Each dimension includes a different number of items, so they differ in range: Scores on DDF range from 5 to 25; scores on DIF range from 7 to 35; and scores on EOT range from 8 to 40. The French TAS–20 presents satisfying psychometrics properties with a global Cronbach's alpha of .79 (Vermeulen & Luminet, 2009) and a three-factor model based on a sample of French students (GFI = 0.89, AGFI = 0.86, and standardized root mean square residual = 0.06; Loas et al., 1997). This scale is the most widely used to evaluate alexithymia (Taylor & Bagby, 2000).

Results

The overall factor structure was investigated in the latent variable framework (e.g., Bollen, 1989; Byrne, 2001). Based on recommendations of Hu and Bentler (1999) and Beauducel

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[2]Additionally, we also considered the normality of the distribution (e.g., items with strongly asymmetrical distribution were excluded) or residual covariance (items redundant with other items were deleted). Quite often the suppressed items actually suffered several of these problems. (A detailed list of the reasons for the exclusion of each items, as well as the full results of the analysis for the complete scale, are available from the second author.)

TABLE 1.—Fit indexes of overexcitability models in preadolescents and adolescents (Study 1) and adults (Study 2).

	NP	df	χ^2	χ^2/df	RMSEA [90% CI]	SRMR	CFI	AIC
Preadolescents and adolescents (Study 1)								
M1: Five independent factors	105	560	1544.42	2.76	0.061 [0.057. 0.065]	0.139	0.743	54599.9
M2a: Five correlated factors	115	550	1047.40	1.90	0.044 [0.040, 0.048]	0.053	0.870	54122.9
M2b: M2a with residual covariancea	116	549	1015.17	1.85	0.042 [0.038, 0.046]	0.053	0.878	54092.7
M3: One second-order factor	111	555	1041.06	1.88	0.043 [0.039, 0.047]	0.056	0.873	54108.6
Adults (Study 2)								
M1: Five independent factors	105	560	1764.2	3.15	0.070 [0.067, 0.074]	0.142	0.823	41036.8
M2a: Five correlated factors	115	550	1507.97	2.74	0.063 [0.059, 0.067]	0.065	0.859	40800.5
M2b: M2a with residual covarianceb	121	544	1179.22	2.17	0.052 [0.048, 0.056]	0.06	0.907	40483.7
M3: One second-order factor	116	549	1195.9	2.18	0.052 [0.048, 0.056]	0.064	0.905	40490.4

Note. NP = number of estimated parameters; *df* = degrees of freedom; SRMR = root mean square residual; RMSEA = root mean square error of approximation; CFI = comparative fit index; AIC = Akaike information criterion.
aResidual covariance between Items 48 and 37. bResidual covariance between the following pairs of items: 48–37, 41–26, 40–23, 22–4, 22–24. Item 34 also loads on the Sensual factor (in addition to Imaginational).

and Wittmann (2005), we used the following model fit indexes: the root mean square residual (SRMR $\leq$ .08), the RMSEA (RMSEA $\leq$ .06), and the CFI (CFI $\geq$ .90). These analyses were conducted with M*plus* 5.2 (Muthén & Muthén, 2007), using full information likelihood estimation. The difference between nested models was statistically tested with a likelihood ratio test–difference in chi-square statistic ($\Delta\chi^2$) for a given difference in degrees of freedom (Δdf).

Specifically, three models were tested: M1, the independence model, in which correlations between factors were set to 0 (the original structure implicitly hypothesized by Dabrowski); M2, a model allowing all factors to be correlated freely (the more frequently found factor structure in various languages); and M3, a model with a second-order OE factor, which could possibly be more parsimonious to account for correlations between first-order factors.

Detailed results of the models' fit indexes are provided in Table 1. The fit of the independence model (M1) was poor;

the SRMR in particular was unacceptably high. The model allowing correlations between factors (M2a) was significantly better ($\Delta\chi^2 = 497.03$, $\Delta df = 10$, $p < .0001$). This model had good RMSEA and SRMR values (0.044 and 0.053, respectively), although the CFI remained quite low (.87). To improve this model, modification indexes were inspected; as we did not want to unnecessarily complicate the model, we freed only one additional parameter that had a high modification index, the residual covariance between Items 48 and 37. This model is M2b. Based on M2b, the last model (M3) was estimated. The fit of this model was similar to M2b in terms of CFI, RMSEA, and SRMR. However, the likelihood ratio test indicated that the loss in fit was nonetheless significant ($\Delta\chi^2 = 25.9$, $\Delta df = 5$, $p < .001$). Hence the better model was M2b. In this model correlations among the five factors were quite high, about .50 in most cases (see Table 2 for details), although the Psychomotor factor remained relatively independent of the four others. Reliabilities (also in Table 2) were

TABLE 2.—Factor descriptions for preadolescents and adolescents (Study 1) and adults (Study 2): Descriptive statistics, correlations, and reliability.

	Psychomotor	Sensual	Intellectual	Imaginational	Emotional
Preadolescents and adolescents (Study 1)					
Correlations (and reliability)					
Psychomotor	(.78)				
Sensual	.12	(.78)			
Intellectual	.30	.45	(.75)		
Imaginational	.08	.43	.43	(.75)	
Emotional	.12	.48	.47	.47	(.69)
Descriptive statistics					
M (Male/Female)	3.48 (3.59/3.34)	2.89 (2.81/3.00)	3.15 (3.27/3.00)	2.95 (3.02/2.86)	3.31(3.17/3.49)
SD (Male/Female)	0.93 (0.92/0.93)	0.92 (0.87/0.99)	0.85 (0.84/0.83)	0.93 (0.90/0.97)	0.80 (0.81/0.75)
Skewness	−0.33	0.10	−0.03	0.22	−0.19
Kurtosis	−0.43	−0.61	−0.27	−0.48	−0.23
Adults (Study 2)					
Correlations (and reliability)					
Psychomotor	(.89)				
Sensual	.10	(.88)			
Intellectual	.19	.44	(.88)		
Imaginational	−.03	.39	.33	(.81)	
Emotional	.06	.33	.27	.27	(.78)
Descriptive statistics					
M	3.05	3.25	3.32	2.86	3.72
SD	0.90	0.89	0.82	0.79	0.68
Skewness	0.00	−0.02	−0.14	0.16	−0.76
Kurtosis	−0.50	−0.53	−0.39	−0.44	1.16

Note. All correlations > .12 are significant at *p* < .01.

TABLE 3.—Factor loadings for preadolescents and adolescents (Study 1) and adults (Study 2).

	Preadolescents and Adolescents (Study 1)		Adults (Study 2)	
	Estimate	SE	Estimate	SE
Psychomotor				
Item_7	0.65	0.03	0.71	0.03
Item_10	0.62	0.04	0.76	0.02
Item_15	0.71	0.03	0.78	0.02
Item_18	0.52	0.04	0.64	0.03
Item_39	0.57	0.04	0.79	0.02
Item_42	0.39	0.05	0.63	0.03
Item_50	0.66	0.03	0.84	0.02
Sensual				
Item_3	0.60	0.04	0.75	0.02
Item_8	0.50	0.04	0.70	0.03
Item_32	0.61	0.04	0.86	0.02
Item_37	0.59	0.04	0.71	0.03
Item_45	0.54	0.04	0.83	0.02
Item_46	0.55	0.04	0.52	0.04
Item_48	0.61	0.04	0.62	0.03
(Item_34)			(0.30)	(0.05)
Intellectual				
Item_19	0.58	0.04	0.69	0.03
Item_23	0.51	0.04	0.58	0.04
Item_25	0.55	0.04	0.77	0.02
Item_30	0.56	0.04	0.78	0.02
Item_36	0.46	0.04	0.67	0.03
Item_40	0.56	0.04	0.61	0.03
Item_43	0.60	0.04	0.82	0.02
Imaginational				
Item_4	0.63	0.04	0.65	0.04
Item_14	0.42	0.04	0.71	0.03
Item_22	0.71	0.03	0.64	0.04
Item_24	0.63	0.03	0.61	0.04
Item_28	0.43	0.04	0.38	0.05
Item_34	0.59	0.04	0.42	0.05
Item_47	0.45	0.04	0.67	0.04
Emotional				
Item_6	0.42	0.05	0.63	0.04
Item_11	0.45	0.05	0.64	0.04
Item_26	0.43	0.05	0.52	0.05
Item_31	0.38	0.05	0.67	0.04
Item_35	0.57	0.04	0.53	0.04
Item_41	0.62	0.04	0.44	0.05
Item_49	0.57	0.04	0.58	0.04

acceptable to good, ranging from .69 to .80. Factor loadings (see Table 3) ranged from .38 to .71, with the majority around .50.

The discriminant and construct validity of the French translation of the OEQ2 was investigated by evaluating the correlations of the OEQ2 with the NNAT (intelligence), the BB5 (personality), and the TAS–20 (alexithymia). Pearson's correlation coefficients are reported in Table 4.

Results indicated nonsignificant or very small correlations between all OEs and intelligence evaluated with the NNAT. Concerning personality, results indicated no relevant correlation between OEs and Conscientiousness. Moreover, only one positive and moderate correlation was observed between Psychomotor OE and Extraversion ($r = .28$), whereas no other OE was significantly correlated with this trait. Apart from the Psychomotor OE, other OEs correlated positively with Openness. Imaginational and Emotional OEs were also positively linked to Neuroticism.

Surprisingly, positive correlations were observed between OE and alexithymia: Except Psychomotor, all the other OEs correlated positively and moderately with DDF, strongly with DIF, and moderately with global alexithymia evaluated with the TAS–20. However, as expected, negative correlations were found between EOT and Intellectual and Emotional OEs.

Gender differences were investigated through classical mean comparisons (see Table 2 for descriptive statistics). Student's t tests and effect sizes were calculated and equality of variances was verified by Levene's (1960) test. With the exception of Imaginational OE, all the other OE dimensions revealed significant gender differences ($p < .05$) Girls had slightly higher Sensual OE, $t(471) = 2.23$, $p < .05$, Cohen's $d = .21$, $M = 3.00$, $SD = 0.99$, and Emotional OE, $t(471) = 4.36$, $p < .001$, Cohen's $d = .40$, $M = 3.49$, $SD = 0.75$, scores than boys (respectively, $M = 2.81$, $SD = 0.87$, and $M = 3.17$, $SD = 0.81$), whereas girls have slightly lower means on Psychomotor OE, $t(471) = 2.85$, $p < .01$, Cohen's $d = .26$, $M = 3.34$, $SD = 0.93$, and Intellectual OE, $t(471) = 3.49$, $p < .001$, Cohen's $d = .32$, $M = 3.00$, $SD = 0.83$, than boys (respectively $M = 3.59$, $SD = 0.92$, and $M = 3.27$, $SD = 0.84$).

Discussion

In this first study, the best fitting model was the five-correlated-factor model. This is in accordance with past research and other translations of the OEQ2 (e.g., Siu, 2010; Tieso, 2007) although it is different from Dabrowski's original conception of OE (e.g., Ackerman, 2009). Additionally, the OEQ2 was not associated with intelligence and Conscientiousness, whereas OE was correlated with Openness. The surprising positive correlations observed with alexithymia encouraged us to explore this link in a second study. However, we first were interested in administering the OEQ2 to young adults. We wanted to investigate more fully the factor structure and the psychometric properties of this scale (reliability, stability, and construct validity with alexithymia) in an adult sample.

STUDY 2

Method

Participants and data collection. The sample was composed of 436 students in psychology ($M = 21.32$ years, $SD = 5.45$, range $= 17–62$), mostly female (86%). Participants were French-speaking individuals in Belgium ($n = 175$), Switzerland ($n = 143$), and France ($n = 118$). Groups did not differ on age, $F(2, 432) = 1.44$, ns. A first subsample of 60 participants completed the questionnaire twice to test reliability ($M = 21.69$, $SD = 6.46$, range $= 18–62$, 90% female). The subsample was composed of Belgian (63%) and French students (37%). A second subsample of 33 participants completed the questionnaire a third time to retest reliability ($M = 22.16$, $SD = 7.97$, range $= 17–62$, 97% female). This subsample also included Belgian (61%) and French students (39%). Of the second subsample, 78% completed the questionnaire all three times, whereas other students agreed to participate only the second or third time.

Participants were invited to complete the questionnaire online. Some of them agreed to be contacted again later for the retest. One week after their first completion, students were

TABLE 4.—Divergent and construct validity for preadolescents and adolescents (Study 1): Correlations between the Overexcitability Questionnaire 2 and intelligence (NNAT), personality (BB5), and alexithymia (TAS–20).

| | NNAT | BB5 | | | | | TAS–20 | | | |
		Agreeableness	Conscientiousness	Extraversion	Openness	Neuroticism	DDF	DIF	EOT	Alexithymia
Correlations										
Psychomotor	−.14	−.07	.19	**.28**	.04	.08	.01	.14	.08	.13
Sensual	.04	.10	.13	−.10	**.20**	.18	**.26**	**.43**	−.15	**.33**
Intellectual	.06	−.15	.12	−.01	**.38**	.14	**.23**	**.42**	**−.21**	**.29**
Imaginational	.04	−.04	−.14	.02	**.41**	**.27**	**.24**	**.52**	−.17	**.37**
Emotional	−.01	.20	.00	.01	**.23**	**.25**	**.28**	**.47**	**−.29**	**.30**
Descriptive statistics										
Reliability	.87	.78	.88	.74	.68	.76	.49	.71	.03	.58
M	100.28	64.41	60.59	62.73	62.45	60.97	15.06	19.12	23.50	57.65
SD	14	10.09	11.94	9.43	8.91	8.97	4.01	6.00	3.93	9.24
Skewness	0.55	−0.75	−0.17	−0.06	0.14	−0.45	−0.16	−0.01	0.09	−0.14
Kurtosis	0.95	1.53	−0.41	0.02	−0.18	0.06	−0.08	−0.52	0.63	−0.22

Note. All correlations > .10 are significant at $p < .05$. Correlations > .20 are shown in bold (significant at $p < .001$). NNAT = Naglieri Nonverbal Ability Test; BB5 = Brief Big Five; TAS–20 = Toronto Alexithymia Scale; DDF = difficulty describing feelings; DIF = difficulty identifying feelings; EOT = externally oriented thinking.

invited to complete the OEQ2 a second time. The time interval between both evaluations was 12.35 days on average (SD = 8.30 days, range = 6.37–37.87 days). Four months later, students were invited to complete the OEQ2 a third time (M = 5 months, 10 days, SD = 6.26 days, range = 4.5–5.5 months).

Materials. In this study, only OE and alexithymia were assessed. In addition to the OEQ2 and the TAS–20, we administered the Bermond–Vorst Alexithymia Questionnaire (Bermond & Vorst, 1994) translated into French by Zech, Luminet, Rimé, and Wagner (1999). This scale offers the possibility to assess complementary dimensions of alexithymia. The BVAQ includes 40 items rated on 5-point Likert scales ranging from 1 (*not agree at all*) to 5 (*completely agree*) and assesses five dimensions: verbalization (difficulty using words to describe emotions), identification (difficulty recognizing emotions), analysis (difficulty explaining emotions), fantasy life (difficulty daydreaming), and emotionalizing (difficulty being stimulated by emotional events). Each dimension's subscale varies from 8 to 40, and the global score is computed as the sum of the five dimensions, ranging from 40 to 200. High scores represent high alexithymia. The BVAQ has satisfactory psychometric qualities (Bermond et al., 2007; Bermond, Vorst, Vingerhoets, & Gerritsen, 1999; Vorst & Bermond, 2001): Internal consistency of each dimension varies from .71 to .81 (Zech et al., 1999) and the five-factor structure is satisfactory, $\chi^2(730) = 1768.8$, RMSEA = .062, SRMR = 0.081 (Müller, Bühner, & Ellgring, 2004).

Results

Detailed results of models' fit indexes are provided in Table 1. Once again, the fit of the independence model (M1) was poor. The model allowing correlations between factors (M2a) was much better in this respect (SRMR = .065). According to the likelihood ratio test, this model fit the data much better than the independence model, $\Delta\chi^2 = 256.3$, $\Delta df = 10$, $p < .0001$). This correlated model also had an acceptable RMSEA (0.063), but the CFI remained quite low (.86).

As for preadolescents and adolescents, to improve this model, modification indexes were inspected; these indexes

suggested setting free several parameters. Considering only the modification indexes with an important χ^2 change (> 30), we chose to free six additional parameters: one cross-loading (Item 34 loading on the Sensual and Imaginational factors) and five residual covariances (between the following pairs of items: 48–37, 41–26, 40–23, 22–4, 22–24). This model is M2b, which fit the data better and had a more acceptable CFI value (0.91), although it remains somewhat low. However, the SRMR (0.052) and RMSEA (0.06) values indicate a good fit.

Finally, based on M2b, the last model (M3) was estimated; this model estimates a general, second-order OE factor (instead of the 10 correlations between the five factors). This model is simpler and more parsimonious, and its fit was indeed comparable to M2b in terms of CFI, RMSEA, and SRMR. However, the likelihood ratio test indicated that the loss in fit was nonetheless significant ($\Delta\chi^2 = 16.7$, $\Delta df = 5$, $p = .005$). Hence, in the end, the best model is M2b.

Correlations between the five factors and their respective reliabilities are provided in Table 2; loadings for each item are provided in Table 3. Loadings ranged from .38 to .86, with most of them being between .50 and .70. Reliability figures were also high, from .78 to .88. Most correlations between factors were positive (between .25 and .51), with a relative exception for the Psychomotor factor, which was only weakly correlated to the other factors (between 0 and .20).

Temporal stability was investigated using test–retest Pearson's correlation coefficients. The first stability analysis at 12 days produced satisfactory results: Psychomotor ($r = .91$), Sensual ($r = .93$), Intellectual ($r = .91$), Imaginational ($r = .91$), and Emotional OEs ($r = .77$). The second stability analysis at 5 months also yielded satisfactory results: Psychomotor ($r = .84$), Sensual ($r = .90$), Intellectual ($r = .90$), Imaginational ($r = .78$), and Emotional OEs ($r = .78$). The construct and discriminant validity were investigated using correlation analyses with two measures of alexithymia: the TAS–20 and the BVAQ (see Table 5). As in Study 1, the Psychomotor OE was not significantly correlated with alexithymia. As expected, many correlations were negative, except for Emotional OE, which correlated positively with DIF. However, Sensual OE correlated negatively with both EOT evaluated with the TAS–20 and the BVAQ. Intellectual OE was

TABLE 5.—Divergent and construct validity for adults (Study 2): Correlations between the Overexcitability Questionnaire 2 and alexithymia (TAS–20 and BVAQ).

	TAS–20				BVAQ					
	DDF	DIF	EOT	Alexithymia	DDF (Verbalization)	DIF (Identification)	EOT (Analyze)	Fantasy Life	Emotionalizing	Alexithymia
Correlations										
Psychomotor	−.02	−.01	−.01	−.02	−.03	−.09	−.02	.14	.02	.01
Sensual	−.15	.00	**−.35**	−.19	−.20	−.17	**−.32**	**−.26**	−.05	**−.33**
Intellectual	**−.23**	−.05	**−.54**	**−.33**	**−.25**	**−.24**	**−.38**	−.17	.13	**−.30**
Imaginational	.02	.19	−.13	.05	−.03	.06	−.11	**−.68**	−.03	**−.28**
Emotional	.00	**.24**	**−.28**	.02	−.12	.01	**−.42**	**−.21**	**−.60**	**−.41**
Descriptive statistics										
Reliability	.83	.81	.59	.83	.87	.80	.79	.82	.74	.86
M	14.07	17.96	18.03	50.06	23.46	19.62	16.24	17.40	18.70	95.42
SD	4.54	5.28	3.88	10.41	6.74	5.11	4.32	5.74	4.69	16.06
Skewness	0.24	0.26	0.24	0.17	0.31	0.22	0.65	0.81	0.75	0.42
Kurtosis	−0.76	−0.33	0.42	−0.04	−0.46	0.03	1.17	0.57	0.88	1.17

Note. All correlations > .10 are significant at $p < .05$. Correlations > .20 are shown in bold (significant at $p < .001$). TAS–20 = Toronto Alexithymia Scale; BVAQ = Bermond–Vorst Alexithymia Questionnaire; DDF = difficulty describing feelings; DIF = difficulty identifying feelings; EOT = externally oriented thinking.

negatively related to difficulty describing and verbalizing feelings in both scales, as well as to operative thinking and to global alexithymia, whereas Intellectual OE correlated negatively only with difficulty identifying feelings evaluated by the BVAQ. Emotional OE correlated negatively and moderately with EOT assessed by the TAS–20 and when assessed with the BVAQ. The global alexithymia score in the BVAQ revealed only negative correlations with OEs: More alexithymic participants tended to score lower on all dimensions of the OEQ2.

Also, as expected, there were strong negative correlations between Emotional OE and Emotionalizing and between Imaginational OE and Fantasy life. Fantasy life also correlated negatively with two other OEs: Sensual and Emotional OEs.

Discussion

The same expected factorial structure was found in this adult sample as in the preadolescent and adolescent sample. Reliabilities and factor loadings were slightly higher than in the adolescent sample; on the other hand, there were more residual covariance issues to address in scale development. Additionally, correlations between factors were small and the pattern of correlations with alexithymia was different than in the preadolescent and adolescent group.

GENERAL DISCUSSION

The purpose of this study was to translate and adapt the OEQ2 into French and to test its psychometric properties. As a secondary objective, construct and divergent validity of the instrument were investigated through correlations with intelligence, Big Five personality factors, and alexithymia. Finally, gender differences were also examined. The factorial structure was studied and compared in a sample of preadolescents and adolescents and in a sample of adults. The findings support the five-correlated-factor model of OE in both groups, albeit with some important differences. Correlations between OE and other related constructs were mostly in line with past research and our initial hypotheses, although some unexpected results were observed. Finally, gender effects mainly supported our

hypotheses that females tend to score higher than males on Sensual and Emotional OEs, whereas they tend to score lower on Psychomotor and Intellectual OEs.

The Seven-Item Version

In both samples, the factorial structure of the 10-item scale was not satisfactory. For that reason, we decided to improve and simplify the French version of the OEQ2 by removing problematic items and creating a shorter version with seven items per dimension. Our results indicated that the reliability and validity of the OEQ2 was not seriously affected by this modification. The largest change in reliability was observed for the Emotional OE in the adult group (from .84 to .78). Concerning validity, the shorter scale correlated very highly with the longer equivalent subscales (all correlations were above .95). Hence, the losses are negligible given the gain in profitability (cleaner factor structure and shorter administration time).

Reliability and Factor Structure

Results showed an approximately normal distribution for each score. Only Emotional OE presented limit values with a slightly left asymmetry in the adult sample, corresponding to a tendency to score high on this subscale. Falk et al. (1999) already noted the less normal distribution of Emotional OE scores compared to other subscales. However, the French short OEQ2 does not present this limitation in the adolescent sample. Overall, the reliability of this French version of OEQ2 is good to excellent and in line with reliability indexes of the English version.

Confirmatory factor analysis indicated that a five-correlated-factor model fit the data quite well. The factors were positively correlated with each other, particularly in the adolescent sample, although the Psychomotor OE was relatively independent in both groups. This is in contrast with conflicting claims found in the literature that the five OE factors are independent (Ackerman, 2009; Carman, 2011). The five-correlated-factor model had both an RMSEA < .06 and SRMR < .08, a result that supports the conclusion of adequate fit (Hu & Bentler, 1999), even when the CFI is only .90

(Beauducel & Wittmann, 2005). Thus, the shortened French OEQ2 shows an acceptable fit, similar to the original English version or other translations (e.g., Siu, 2010; Tieso, 2007), and even better than the Korean version (Piirto et al., 2008).

It is important to note that Dabrowski's TPD suggested these five dimensions are independent of each other. The findings reported here in both samples did not support this factor structure, but rather support a related five-factor model as found by Falk et al. (1999). Five-correlated-factors models allow profiling of the intraindividual differences, whereas the score of each OE allows interindividual comparisons, for instance regarding gender differences, as examined in this article.

The nonsignificant correlation between OE and intelligence supports the hypothesis that intelligence is unrelated to OE and can be viewed as an indicator of the OEQ2's divergent validity (Carman, 2011; Mendaglio, 2012). It should be noted that intelligence assessed by the NNAT is different from Intellectual OE–Intellectual OE corresponds more to thinking about thinking than classical intelligence tests mainly used to identify giftedness. This divergent validity supports Mendaglio's (2012) point of view, which considered that OE alone is not sufficient to identify gifted individuals.

Moreover, correlations with the Big Five personality factors provided evidence for the OEQ2's construct validity. First, as expected, positive correlations were found between Openness and OE dimensions. This pattern of results is coherent with the supposedly heightened curiosity and activity at the core of OE. Moreover, the fact that Extraversion is associated only with Psychomotor OE and is the only OE that is not associated with Openness could lead to two different explanations: (a) Psychomotor OE could lead to negative disintegration (when only the dissolving part of the TPD is experienced with conflicts and negative emotions but no resolution–the resolution of these conflicts leads to positive disintegration; Mendaglio, 2008; Mika, 2006), decreasing the Openness score; or (b) this result could correspond to an impulsive-reflective style that opposes subjects who answer the task immediately to those who favor the correct answer instead of a fast answer (Kagan, 1965) as in Markon, Krueger, and Watson (2005), who placed impulsivity as a third dimension in a hierarchical conception of personality. This result could oppose a developmental potential oriented to action (Extraversion and Psychomotor OE, corresponding to an impulsive style) and a developmental potential oriented to thinking (Openness, Intellectual, and Imaginational OEs, corresponding to reflective style). Second, Imaginational and Emotional OEs were positively related to Neuroticism. Because OE is defined by high excitability, it should indeed be positively correlated with Neuroticism, as this personality factor, among other traits, represents overall nervous system excitability (e.g., McCrae & Costa, 1990). Finally, and contrary to our expectation, no negative correlations between Conscientiousness and OE were found. Although this awaits deeper investigation in further research, we can suggest that the correlation between Agreeableness and Emotional OE reveals the higher sensitivity and empathy of people with high Emotional OE (e.g., Ackerman, 2009). Thus, OE and the Big Five model are two different views of personality, and their combination might enhance the understanding of the development of personality. We also assessed the relationship between OE and alexithymia. In

Study 1, contrary to our expectations, positive correlations were observed between OE and alexithymia. Specifically, preadolescents and adolescents who have greater difficulties describing and identifying their feelings tend to score higher on Sensual, Intellectual, Imaginational, and Emotional OEs. These surprising results could be due to the very low reliability of the TAS–20 scale in an adolescent sample (α varies from .03 to .71). However, results also indicated negative correlations with EOT, the operative thinking style, in which thoughts are turned to concrete aspects of life at the expense of emotional aspects. This specific finding is in accordance with our initial hypothesis.

In Study 2, results mostly supported our expectations. Imaginational and Emotional OEs correlated strongly and negatively with BVAQ Fantasy Life and Emotionalizing subscales. Jacob and Hautekeete (1999) explained that alexithymics undervalue the level of affect intensity, thus revealing a disinterest for emotions. Additionally, the several negative correlations between BVAQ and various dimensions of OE support the general idea that high alexithymics are not easily stimulated or excited. Differences between the two age groups suggest that there might be some developmental issues requiring further exploration.

The results of mean comparisons performed in the preadolescents and adolescents sample supported past findings: Girls scored higher than boys on Sensual and Emotional OEs (Ackerman, 1997; Bouchet & Falk, 2001; Gross et al., 2007; Miller et al., 1994; Tieso, 2007) and lower on Psychomotor OE (Bouchet & Falk, 2001; Tieso, 2007). These differences could reflect differences in traditional socialization as a traditional gender role: "feminine personality characteristics were more emotional and sensual; those with masculine characteristics were more intellectual" (Miller, Falk, & Huang, 2009, p. 166) as typical stereotypes start to differentiate males and females during adolescence (Gross et al., 2007). Similar results were found in alexithymia research with the emotionalizing subscale of the BVAQ (Bermond et al., 1999): Females scored lower than males, showing a greater tendency to be stimulated by emotional events. Piirto et al. (2008) explained that Western culture and schools encourage their students to express their point of view and especially their feelings. Based on both of these studies (Bermond et al., 1999; Piirto et al., 2008), we can conclude that females are more inclined to express their feelings because they have greater tendency to be stimulated by emotional events.

Limitations, Future Research, and Conclusion

In this article, we investigated the psychometric properties of a French version of the OEQ2 in a sample of preadolescents and adolescents and adults. We found that this version of the OEQ2 presents satisfactorily similar psychometric properties as the original version and other translations. We also found that many parameters differed across groups (i.e., loadings, correlations, residual covariances, and factors' means). Although some of these differences might have arisen from idiosyncrasies of the individual samples, we suggest that future research pursue the examination of these differences. Furthermore, additional comparisons should be performed, for instance between gifted adolescents and average adolescents.

Indeed, although intelligence is uncorrelated to OE, gifted adolescents might show a special pattern of loadings or correlation between factors. In the same vein, gender differences should be investigated more thoroughly. Herein, we reported differences between boys and girls, but we were limited in exploring gender differences in adults because our adult sample contained mainly women. This issue also limited the comparison between preadolescents and adolescents and adults. Additionally, the method was not the same in both samples, because preadolescents and adolescents completed the questionnaire in their classroom, whereas adults completed it online. However, there is recent evidence, at least for the TAS–20, that the Internet and paper versions are comparably reliable and valid (Bagby, Ayearst, Morariu, Watters, & Taylor, 2014).

Another limitation of our study is that no Big Five measures were included in the adult sample. However, we provided a starting point for the investigation of the relation between OE and the Big Five, showing that the pattern of correlations in preadolescents and adolescents was consistent with the face validity of OEQ2. Future studies might pursue this line of investigation in several ways. First, correlations between OE and the Big Five could be compared in various samples (preadolescents and adolescents and adults, gifted and average). Second, facets of the Big Five (instead of overall domains) might be used to deepen our understanding of classic personality traits and OE. In particular, intellectual OE should be more strongly related to the ideas and fantasy facets than to overall Openness and other facets. Similarly, as we have seen that Emotional OE correlated modestly with Openness, it is likely that this correlation would be higher if the specific feelings facet were considered instead of overall Openness. More generally, studies about OE could also include measures of creativity, a construct that is arguably close to both intelligence and Openness and that has already been associated with OE (Piechowski, 2003).

Finally, the relations between OE and alexithymia should be studied from a developmental perspective. Ackerman (2009) provided a good summary and examples of how different OEs (Emotional in particular) evolve over time.

In conclusion, along with other researchers (e.g., Piechowski, 2006; Piirto, 2002, 2004), we believe that OE is a valuable construct, adequately measured with the OEQ2. This version of the OEQ2, unlike the first version, is a practical tool that is easy to administer in various populations. OE can be situated at the crossroads between intelligence, personality, creativity, and emotions. Indeed, in Dabrowski's theory, OE is necessary to access a high level of developmental potential, but OE also leads to negative disintegration as, for example, Emotional OE, which was associated with better psychological and social maladjustment (Chang & Kuo, 2013). As such, this should retain the attention of many researchers interested in individual differences.

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