French adaptation of the Mini-IPIP:
A short measure of the Big Five

Adaptation francophone du Mini-IPIP:
une mesure brève de la personnalité selon le Big Five

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Abstract

Introduction: The Big Five, or the Five-Factor Model (FFM) of personality, is the dominant model in trait psychology. Instruments to assess personality traits are usually long and not available in French. The Mini-International Personality Item Pool (Mini-IPIP) is a brief measure evaluating personality traits according to the Big Five model with promising psychometric properties.

Objective: The main purposes of this study were to develop and validate a French adaptation of the Mini-International Personality Item Pool.

Method: In Study 1, adaptation procedures that led to the translation of the French version as well as steps to maximize equivalence are described, in addition to internal consistency, temporal stability, and factor structure within a sample of 139 participants. In study two, confirmatory factor analysis was carried out with a sample of 1308 participants, and convergent validity was explored with several pertinent constructs.

Results: Internal consistency and test-retest correlations over a four-week period suggest adequate reliability, with coefficients respectively ranging from .64 to .81 and .74 to .89. Exploratory factor analysis suggested a sharply delineated structure. In Study 2, confirmatory factor analyzes revealed a five-factor solution consistent with the Big Five model, and convergent validity with several constructs was detailed.

Conclusion: Overall, results pointed to a satisfactory equivalence between the original and the adapted instrument. The satisfactory indices of reliability and validity of the Mini-IPIP warrant the use of the French adaptation of the Mini-IPIP.

Keywords: personality, Big Five, adaptation, translation, French, reliability, validity, psychological assessment, psychometrics.

Résumé

Introduction : Le modèle des traits de la personnalité est l'une des approches les plus utilisées pour conceptualiser et évaluer la personnalité. La plupart des mesures développées comportent de nombreux énoncés, ce qui entraîne une longue durée de passation. De plus, peu d'instrument sont disponibles en français. Le Mini-International Personality Item Pool (Mini-IPIP) est une brève mesure des traits de la personnalité selon le modèle du Big Five.

Objectif : L'objectif de cette étude est de développer et d'explorer les propriétés psychométriques d'une adaptation francophone du Mini-IPIP.

Méthode : Dans la première étude, la procédure d'adaptation en langue française est décrite, ainsi que les mesures prises afin de maximiser l'équivalence de notre mesure avec l'instrument original. De plus, auprès d'un échantillon de 139 participants, la cohérence internes et la stabilité temporelle sur une période de quatre semaines ont été explorées. Enfin, une analyse factorielle exploratoire a été effectuée. Dans la deuxième étude, auprès de 1308 participants, la structure factorielle a été évaluée à l'aide d'analyses factorielles confirmatoires. De plus, la convergence du Mini-IPIP a été observée en lien avec plusieurs construits pertinents.

Résultats : Les indices de cohérence interne et de stabilité temporelle variaient respectivement entre .64 et .81, puis entre .74 et .89. L'analyse factorielle exploratoire suggérait une structure factorielle adéquate et cohérente avec le modèle théorique du Big Five, ce qui fut répliqué avec les analyses confirmatoires. Enfin, les dimensions du Mini-IPIP présentaient des corrélations significatives avec différents construits théoriquement liés.

Conclusion : Dans l'ensemble, les résultats suggèrent que la version adaptée du Mini-IPIP est équivalente à la mesure originale et que ses propriétés psychométriques sont adéquates.

Mots-clés : Personnalité; Modèle en cinq facteurs; adaptation linguistique; traduction; fidélité; validité; évaluation psychologique; psychométrie.

French adaptation of the Mini-IPIP: A short measure of the Big Five

The Big Five, or the Five-Factor Model (FFM) of personality, is the dominant model in trait psychology. It has been extensively used to study normal personality across the life span. Today, it is generally accepted that personality traits are relatively stable, albeit some changes are observed over the life course (Roberts & DelVecchio, 2000; Roberts, Walton, & Veichtbauer, 2006). Cross-cultural studies support the replication of the factorial structure of Big-Five measures across different cultural groups (Costa & McCrae, 2005; for reviews see Heine & Buchtel, 2009; John, Naumann, & Soto, 2008), arguing in favor of the universality and robustness of the model. In the last decade, a great deal of empirical work has also been dedicated to the application of this model to psychopathology, both to clinical syndromes and to personality disorders. Meta-analyses highlight significant relationships, albeit some of modest sizes, between the five personality traits and various disorders (e.g., Saulsman & Page, 2004; Kotov, Gamez, Schmidt, & Watson, 2010). These findings have contributed to raise the FFM as an alternative to DSM for personality disorders diagnoses (e.g., Trull & Widiger, 2013). Normative and pathological definitions of traits have been used to capture pathological variations in personality disorders, and different measures are available for that endeavor (e.g., Lynam et al., 2001; Miller et al., 2013).

With the widespread interest in the FFM and personality traits more generally, assessment issues are noteworthy (Donnellan, Oswald, Baird, & Lucas, 2006). Given the extensive testing to which participants are often submitted in large scale studies and potential biasing effects of tests length on score accuracy (e.g., boredom, decrease in motivation or attention), short forms of FFM questionnaires have been developed, such as the 60-item NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992) or the 50-item International Personality Item Pool – Five Factor Model (IPIP-FFM; Goldberg, 1999). However, even though they much shorter, these questionnaires remain long enough to pose a significant toll on participants, especially in the context of comprehensive studies including large batteries of questionnaires or when participants' time use must be very brief as in online surveys without compensation. Consequently, some very brief FFM instruments were developed, such as the Five-Item Personality Inventory and the Ten-Item Personality Inventory (FIPI, TIPI; Gosling, Rentfrow, & Swann, 2003). These very short instruments present several psychometric limitations that pertain to the fact that they include only one or two items per dimension. It ensues that (a) it is nearly impossible to obtain good internal consistency for these short scales; (b) content coverage will be poor; and (c) either exploratory factor analysis and confirmatory factor analysis are compromised, since it is generally recommended to have at least three variables per latent factors in order to perform such analyses. Another noteworthy aspect of FFM questionnaires is that their factors, which are theoretically orthogonal, present usually significant intercorrelations and crossloadings (Block, 1995). The developers of the new 20-item Mini – International Personality Item Pool (Mini-IPIP; Donnellan et al., 2006) took these shortcomings into consideration and designed the Mini-IPIP as a compromise between the longer forms and the very briefs, so that this instrument: (a) is a short form with four items per dimension; (b) includes a sufficient number of items to allow an evaluation of internal consistency and factor structure; and (c) selection of items was made in order to reduce the frequently observed intercorrelations and crossloadings.

Although the Mini-IPIP has been found to possess promising psychometric properties, further investigation of its validity seems warranted, especially in French since scarce findings are available. Studies with linguistically and culturally diverse samples will consolidate the robustness of the measure. Moreover, as the factorial structure of the instrument has been equivocal in previous studies (Baldasaro, Shanahan, & Bauer, 2013; Cooper, Smillie, Corr, 2010; Donnelan et al., 2006; Oliviera, 2017; but see Laverdière, Morin, & St-Hilaire, 2013), further explorations are warranted. Consequently, the objectives of the present series of studies are to present the development of a French adaptation of the 20-item Mini-IPIP, and to further the exploration of its psychometric properties. In the first study, the procedures that allowed to develop the French translation/adaptation of the instruments, as well as results concerning internal consistency, temporal stability, and factor structure. The aim of the second study was to replicate the factor structure in larger and more diversified samples, as well as to verify the convergent validity of the Mini-IPIP.

Study 1: Adaptation and psychometric properties of the Mini-IPIP

Participants and Measures

In order to replicate the characteristics of the sample use in the initial validation study of the English Mini-IPIP (Donnellan et al., 2006), psychology undergraduates were enrolled to participate.

Students from a French Canadian university were invited in class to participate in this study on personality. Out of approximately 250 students, 139 (55.6%) gave informed written consent and completed the Mini-IPIP without receiving any incentives for doing so. Participants were aged from 19 to 59 years old ($M = 22.19$; $SD = 6.09$) and included 83.5% of women. Sixty-seven participants accepted to fill in again the measure four weeks later. Participants completed the Mini-IPIP by indicating on a five-point Likert scale how well each statement described them. Means, standard deviations, coefficient alphas, and retest correlations are presented in Table 1, as well as those of the original instrument taken from Donnellan et al. (2006) study.

Procedure

Method for adaptation. A combination of both forward-adaptation and backward adaptation designs was selected, akin to Vallerand's (1989) recommendations. A committee of four fully bilingual translators was formed. Committee members were considered content experts, since they had a solid academic background in personality and personality evaluation. Two members individually translated the Mini-IPIP from English to French and then met to discuss in order to consensually derive a unique version. This version was then back-translated into English by another committee member. The original English version, the consensually derived French version, and the back-translated English version were then compared by the whole committee. No significant differences were identified between the original version and the back-translated one. In order to rule out the risk of emphasizing literal similarity over conceptual similarity, we followed guidelines developed by Jeanrie and Bertrand (1999) for examining three levels of equivalence: content, conceptual, and linguistic. For content equivalence, each of the four committee members compared the adapted version with the original as to whether the behaviors and symbols described in the items were adequate for the target culture. Conceptual equivalence refers to the meaning of the concept carried by the items. This level of equivalence was systematically rated for all items with a four-point scale that includes the following stem and anchors: "*Referring to the meaning of the original item, the meaning of the translated item is: 1) identical, 2) rather similar, 3) rather different or 4) different*". By exploring linguistic equivalence, we assessed whether or not items employed comparable verb tenses, and idioms comparable in meaning to those of the original version. This type of equivalence was rated using the following scale: "*As compared to the original item, this translated item: 1) uses a perfectly equivalent language, in its form and its meaning, 2) uses an equivalent language in its meaning only, 3) uses an equivalent language in its form only, or 4) does not use an equivalent language*".

Results

Equivalence. In terms of content equivalence, all committee members agreed that the behaviors and symbols described in the items were present in the target culture and were obviously adequate in a French speaking culture. This is not surprising since Western countries (such as for instance the United States and Canada) share many socio-cultural realities. Also, since personality dimensions were found to be partially biological-based and heritable dimensions (e.g., Plomin & Caspi, 1999) and since studies found cross-cultural replication of FFM personality dimensions and facets, content equivalence of FFM instruments more generally seem to be supported both on theoretical and empirical ground. Regarding conceptual equivalence, 16 items were judged to be identical (i.e. rated 1 out of 4 by everyone), while four items (1, 14, 19, 20) received a mean score of 1.25, suggesting that three out of four judges evaluated these as identical (one judge rated "rather similar"), thus the four items can be considered mostly identical conceptually. Finally, all items were judged to be perfectly linguistically equivalent in their form and meaning.

Psychometric properties. Means, standard deviations, coefficient alphas, and retest correlations, and their 95% confidence intervals (CI), are presented in Table 1, for the original (taken from Donnellan et al., 2006) and adapted versions. All coefficient alphas of the adapted version are in the acceptable range ($\alpha = .69$ to $.89$; $M = 80$), especially given the reduced length of these scales (e.g. Streiner, 2003). The standard errors of alphas used in the computation of the 95% CI were derived according to Duhachek and Iacobucci's (2004) method. The retest correlations are high and even superior to those of the original version. For these correlations, 95% CI were computed using the R2 software (Fan & Thompson, 2001; Steiger & Fouladi, 1992). When one examines the correlations between the Mini-IPIP dimensions, only one was found to be superior to .20 ($r = .38$ between Extraversion and Agreeableness; for all correlations: $M = .11$, $SD = .11$, range goes from .00 to .38), mostly supporting the orthogonality of the dimensions. The exploratory factor analysis used a principal axis factoring extraction method and a varimax rotation. The factor structure is reported in

Table 2. The Kaiser measure of sampling adequacy is .69, above the .6 value of good factorability (Tabachnick & Fidell, 2001). Selection of the optimal number of factors present in this solution was based on the examination of Velicer's minimum average partial (MAP) test and Horn's parallel analysis (PA), two well-validated methods for factor selection (Fabrigar et al., 1999; Kahn, 2006; Preacher & MacCallum, 2003). These tests were calculated using macros developed by O'Connor (2000), and both suggested the presence of five factors, in conformity with our a priori hypothesis. Five factors were thus extracted and rotated, explaining 62.86% of variance. Only one nontrivial crossloading was found (.48) for an Intellect item (15, *Have difficulty understanding abstract ideas.*) that also loaded on the Agreeableness dimension.

Study 2: Replication of the factorial structure and convergent validity

The aims of the second study were to replicate the factor structure in a larger sample and to explore convergent validity of the instrument dimensions. Various constructs have been selected to explore the convergence of the Mini-IPIP. To explore the convergence of neuroticism, we selected various indicators of psychological adjustment and psychopathology: depression, anxiety, negative affects, and life satisfaction. Extraversion was put in relation with positive affect and narcissism. Agreeableness was studied in relation to empathy and attachment avoidance. Finally, for intellect and conscientiousness, we selected two specific dimensions of temperament according to Rothbart's model. This model of temperament consists of dimensions that closely parallel Big five factors (Rothbart, Ahadi, & Evans, 2000). Intellect was put in relation to associative sensitivity (frequency and remoteness of automatic cognitive activity) and with the alexithymia dimension of externally-oriented thinking, while conscientiousness linked to activation control (capacity to perform an action when there is a strong tendency to avoid it), a dimension of effortful control and with dimensions of impulsivity.

Participants and Procedure

A sample of 1308 adults was collected for studies on personality. The mean age of participants of this sample was 32 years (SD = 10.61), 77% were female, 55% were single, and 42% were undergraduates. Participants were solicited by email on or social media for a study on personality. After giving informed consent, they completed the instrument the Mini-IPIP and the other measures.

Measures

Anxiety. Participants completed the French adaptation (Gauthier & Bouchard, 1993) of the trait subscale from the State-Trait Anxiety Inventory (STAI; Spielberger, 1983). This subscale comprises 20 items that are rated on a 4-point scale. This instrument is known to possess strong psychometric properties, with internal consistency coefficients reaching .90 (e.g. Gauthier & Bouchard, 1993; Spielberger, 1983). In the current study, the mean is 2.01 (SD = .5) and the Cronbach alpha is .91.

Depression. Depressive symptoms were assessed with the French adaptation of the (Beck Depression Inventory (BDI-II; Beck et al., 1996), a 21-item inventory with 4-point scales. This instrument is also known to possess strong psychometric properties (e.g. α = .92; and test-retest r = .93; Dozois, Dobson & Ahnberg, 1998; also see Beck et al., 1996). In the current study, the mean is 6.98 (SD = 5.95) and the reliability was adequate (α = .87).

Affects. Positive and negative affects were assessed with the French adaptation of the Positive and Negative Affect Schedule (PANAS; Gaudreau, Sanchez, & Blondin, 2006; Watson et al., 1988). Both dimensions of affects are assessed with ten items on a 5-point scale. In the current sample, the reliability was adequate for both the positive (α = .86, M = 3.40, SD = .65) and the negative affect subscales (α = .79, M = 2.04, SD = .57).

Life satisfaction. Participants' levels of life satisfaction were assessed with the French adaptation (Blais, Vallerand, Pelletier, & Brière, 1989) of the 5-item Satisfaction with Life Scale (SLS; Diener et al., 1985), using a 7-point scale. Extensively studied, this instrument consistently showed good psychometric properties (e.g., Pavot & Diener, 1993). In the current sample, the reliability was adequate (α = .85, M = 5.06, SD = 1.25).

Narcissism. Participants' level of narcissism was assessed with the French adaptation of the Narcissistic Personality Inventory (NPI; Brin, 2010), a 40-item instrument assessing personality traits commonly associated with narcissism (Raskin & Terry, 1988). These items are rated on 7-point Likert scales. As the factorial structure of the NPI is not clearly delineated (e.g., Corry, Merritt, Mrug, & Pamp, 2008), we used a total single score as a measure of narcissism. The reliability was adequate in the current sample (α = .91, M = 3.98, SD = .71).

Attachment. Participants completed the French adaptation of the Experience in Close Relationship (ECR; Brennan et al., 1998; Lafontaine & Lussier, 2003), a self-report questionnaire of adult attachment in romantic relationship comprising 36 items answered on 7-point Likert-type scale. The total scores for the two dimensions (anxiety and avoidance) are calculated by averaging ratings of the 18 items per dimension. Internal consistency for the avoidance dimension was .94 ($M = 2.44$, $SD = 1.13$) and .90 for the anxiety dimension ($M = 3.75$, $SD = 1.10$).

Empathy. The Toronto Empathy Questionnaire (TEQ; Spreng, McKinnon, Mar, & Levine, 2009) is designed to provide a unidimensional assessment of respondent's perception of their own empathic abilities and was developed from factor analyses of all available measures of this construct. The TEQ consists of 16-items scored on a scale ranging from 0 (never) to 4 (always). The TEQ has high internal reliability and convergent validity (Spreng et al., 2009). Coefficient alpha in the study was .75.

Alexithymia. The Toronto Alexithymia Scale (TAS; Bagby, Taylor, & Parker, 1994) is a 20-item scale that evaluates three dimensions: difficulty identifying feelings (DIF), difficulty describing feelings (DDF), and externally oriented thinking (EOT). The EOT dimensions assesses a cognitive style oriented toward external stimuli. Participants are asked to rate their agreement with each statement on a 5-point Likert scale. The developers reported an alpha coefficient of .66, and a coefficient of .62 was observed in the current sample, using the French version of the TAS (Loas et al., 2001).

Impulsive behavior. The UPPS Impulsive Behavior Scale is a multidimensional measure of impulsivity comprising four dimensions: negative urgency, lack of premeditation, lack of perseverance, and sensation seeking (Whiteside & Lynam, 2001). Participants rate their agreement for the 45 items on a 4-point scale. The French adaptation had acceptable psychometric properties (Van der Linden et al., 2006). In the current sample, alpha coefficients were adequate: negative urgency (.88), lack of premeditation (.88), lack of perseveration (.97), and sensation seeking (.86).

Temperament. The short Adult Temperament Questionnaire (ATQ; Evans & Rothbart, 2007) is a self-report measure of Rothbart's model of temperament, comprising 77-items with 7-points Likert scale. Four temperament dimensions are assessed with the ATQ, but only two subdimensions, associative sensitivity and activation control. This measure has been used with college and community samples (Evans & Rothbart, 2007), with adequate internal consistency, good factorial structure, and evidence of convergent and divergent validity with the Big Five model. An adapted French version was used in the current study (Laverdière, Diguer, Gamache, & Evans, 2013). In an undergraduate sample, internal consistency for the two retained subdimensions was adequate, as was temporal stability over a one month period.

Results

Descriptive statistics. Sample statistics for Mini-IPIP factors were similar to those found in Study 1: Extraversion ($M = 3.42$, $SD = .83$), Agreeableness ($M = 4.23$, $SD = .66$), Conscientiousness ($M = 3.50$, $SD = .97$), Neuroticism ($M = 2.81$, $SD = 1.10$), and Intellect ($M = 4.05$, $SD = .74$). Mean scores were contrasted between men and women and no significant differences were found for Extraversion (men: $M = 3.36$, $SD = .87$, women: $M = 3.43$, $SD = .81$; $t = .92$, $p = .36$) and Conscientiousness (men: $M = 3.41$, $SD = .97$, women: $M = 3.52$, $SD = .97$; $t = 1.18$, $p = .24$). However, men had significantly higher scores for Intellect (men: $M = 4.23$, $SD = .67$, women: $M = 4.00$, $SD = .75$; $t = -3.27$, $p < .001$) and lower scores for Neuroticism (men: $M = 2.62$, $SD = .86$, women: $M = 2.87$, $SD = .83$; $t = 3.04$, $p = .002$) and Agreeableness (men: $M = 3.88$, $SD = .76$, women: $M = 4.34$, $SD = .59$; $t = 6.55$, $p < .001$).

Factor structure. As the Big Five model proposes a delineated factor structure, and that an adequate factor structure was found using EFA in Study 1, we conducted a CFA in order to evaluate FFM model fit to our data using the weighted least squares means and variance adjusted estimator as Likert scales are categorical in nature. The initial CFA model provided a near reasonable degree of fit to the data (CFI = .90; TLI = .88; RMSEA = .088).

Although the Mini-IPIP does not theoretically possess an intermediate conceptual level between the items and the dimensions, such as the facets seen for longer Big Five instruments, recent findings still suggested that intermediary dimensions may exist in the IPIP structure (DeYoung, Quilty, & Peterson, 2007). Facing similar problems in fitting factor structure of Big Five instruments in recent investigations, researchers have included correlated uniquenesses between items belonging to unmeasured facets of longer Big Five instruments (Laverdière et al., 2013; Marsh et al., 2010). Following a previous study using the Mini-IPIP (Laverdière et al., 2013), this strategy was thus applied for items that had obvious content similarity (#2 and #12, #5 and #20, and #10 and #15 in order to explore the possibility of an improved fit. The fit of the model significantly improves up to a satisfactory level with the addition of these three correlated uniquenesses (CFI = .95; TLI = .94; RMSEA = .064 [CI = .060 - .068]). Standardized loadings from this CFA model are reported in Table 2. None of the standardized loadings were under .30, and only one under .50 suggesting reasonably well-defined factors for a short measurement scale. Latent factor correlations are reported in Table 3 and show that only one correlation was superior to .30 (.49 between agreeableness and extraversion). The other correlations confirm that the factors are reasonably orthogonal, ranging from -.20 to .30. Table 3 also reports scale score reliability coefficients varying from .67 (Intellect/Imagination) to .86 (Conscientiousness). Given the limited number of items used to measure each broad dimension of the Big-Five, and the known association between scale score reliability and the number of items in a scale (Sijtsma, 2009), these coefficients are promising. Correlations between factors scores (observed variables) are also reported in Table 3.

Convergent validity. Correlations of the Mini-IPIP dimensions with the various constructs were as expected (see Table 3). For instance, neuroticism was associated positively with anxiety, depression, negative affectivity, and negatively with positive affectivity and life satisfaction. Extraversion was found to be positively associated with positive affectivity, empathy, and narcissism, and negatively associated with anxiety. Similarly, as expected, agreeableness was found to be significantly related to empathy and avoidant attachment. However, agreeableness was also found to be nonsignificantly associated with narcissism. As expected, positive relationships were observed between dimensions pertaining to attention and the two other Mini-IPIP dimensions. Intellect was found to be correlated with associative sensitivity, while conscientiousness was correlated with activation control. Intellect was also negatively correlated with externally-oriented thinking. Finally, conscientiousness was negatively correlated with impulsivity, especially with dimensions of lack of premeditation and perseverance, and with sensation-seeking. Overall, these results are similar to those observed by Donnellan et al. (2006) for the original version of the Mini-IPIP and add to the construct validity with the variety of constructs assessed.

Discussion

The aim of the first study was to report on the French adaptation of the Mini-IPIP and to examine key psychometric properties of this new version in terms of internal consistency, test-retest reliability and factor structure. This first study reached two main conclusions. Firstly, it showed that the qualitative and quantitative assessment made by judges revealed the adapted items to be largely similar in form, meaning and content to the original items. This adds to the bulk of knowledge establishing the cross-cultural pertinence of Big Five personality indicators in different languages or cultural backgrounds (Costa & McCrae, 2005). Secondly, the observed psychometric properties of the adapted version were adequate and highly similar to those of the original version for all five dimensions of the Mini-IPIP (Donnellan et al., 2006). Also, the factor solution provided unambiguous support to the a priori FFM factor structure. Overall, this first study suggested that the adapted items were adequately understood by judges and participants and suitable for French-speaking populations, and that the adapted measure had psychometric properties comparable to those of

the original instrument.

The second study aimed at cross-validating the factor structure identified in the first study with CFA and to explore convergent validity. As a preliminary step, gender differences were explored, and significant differences were observed. Men reported higher level of intellect, and lower level of agreeableness and neuroticism. These gender-based differences are consistent with robust findings (e.g., Costal, Terraciano, & McCrae, 2001; Feingold, 1994), adding to evidences regarding construct validity. The first confirmatory factor analysis yielded a five-factor structure that was nearly adequate. In a second analysis, correlated uniquenesses between items belonging to unmeasured facets were added, and a more optimal solution was observed, as in previous research (Laverdière et al., 2013; Marsh et al., 2010). This result is very promising and may reflect a particular strength of the instrument, since other CFA models of Big Five inventories often need to incorporate secondary ex post facto secondary loadings to obtain less than optimal indices of model fit (e.g., Church & Burke, 1994; McCrae, Zonderman, Costa, Bond, & Paunonen, 1996). Indeed, Mini-IPIP items were selected in order to reduce dimensions intercorrelations and crossloadings, which may explain the sharper factor structure.

The convergent validity of the Mini-IPIP was generally adequate. Overall, dimensions were meaningfully associated with pertinent constructs in a way similar to results obtained with the original instrument (Donnellan et al., 2006), and in conformity with our a priori hypotheses. Indeed, neuroticism was strongly correlated with indices of psychological symptoms and emotional disturbances and negatively associated with positive emotionality and life satisfactions, while the reverse relationships were observed with extraversion. Extraversion was also associated with a measure of narcissism that assesses assertiveness and social dominance. Agreeableness was positively associated with empathy, in coherence with the content of several Mini-IPIP items taping interest in others and their emotional experience. Also, agreeableness was shown to be negatively correlated with attachment avoidance, a construct reflecting disengagement from emotional connectedness with others. A negative correlation was expected between agreeableness and narcissism. While the NPI taps positive aspects of narcissism like self-esteem or social dominance, more pathological aspects are also assessed, thus the expected negative association with agreeableness. However, past studies also reported small associations between NPI scores and agreeableness (Corry et al., 2008). Finally, both intellect and conscientiousness were correlated with attentional dimensions from Rothbart's model of temperament. Intellect was specifically correlated with associative sensitivity which reflects the presence of cognitive content not related with standard associations with the environment, while consciousness was correlated with activation control, which assesses the capacity to perform an action when there is a strong tendency to avoid it. Intellect/ imagination was also related to a dimension of alexithymia, externally-oriented thinking, as was previously observed (Rosenberg et al., 2016). This cognitive style favoring concrete thinking describes individuals that are practical, inflexible and rigid, which corresponds to low level of intellect/imagination. Finally, impulsive behaviors were negatively associated with conscientiousness. Conscientious individuals are organized, dutiful, self-disciplined and act deliberately, which all represent characteristics associated with impulse control.

Overall, the results suggest that the French version of the Mini-IPIP possesses satisfactory psychometric properties and that it may be considered as equivalent to the original English version. However, our samples included a majority of women (near 80 %), which is a drawback in terms of generalizability, but still comparable to the original sample (79 %). Future work should evaluate the cultural invariance of the structure by comparing the structure of the original English-speaking sample to the French-speaking sample, and the presence of gender or cultural variations by comparing estimated latent means from invariant measurement models.

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Table 1

Means, Standard Deviations, Coefficient Alphas, and Retest Correlations of the Mini-International Personality Item Pool (Mini-IPIP).

Dimensions	Original version				Adapted version					
	M	*SD*	*α*	Retest	*M*	*SD*	*α*	95% CI	Retest	95% CI
Extraversion	3.45	.90	.82	.87	3.52	.81	.76	.70 - .83	.87	.79 - .92
Agreeableness	4.15	.64	.75	.62	4.45	.45	.69	.56 - .75	.74	.61 - .83
Conscientiousness	3.40	.86	.75	.75	3.43	.93	.81	.76 - .86	.84	.75 - .90
Neuroticism	2.62	.83	.70	.80	2.75	.90	.81	.76 - .86	.88	.81 - .92
Intellect	3.74	.76	.70	.77	3.91	.76	.72	.65 - .80	.89	.82 - .93

Table 2
Standardized Coefficients of the Exploratory and Confirmatory Factor Analysis.

Mini-IPIP dimensions	*Study 1*	*Study 2*
Extraversion		
1. Je suis le bout en train dans les partys / Am the life of the party	.66	.63
11. Je parle à plusieurs personnes différentes dans les partys / Talk to a lot of different people at parties	.52	.67
6. Je ne parle pas beaucoup / Don't talk a lot	.69	.70
16. J'ai tendance à rester en retrait / Keep in the background	.70	.87
Agreeableness		
2. Je sympathise avec les sentiments des autres / Sympathize with others' feelings	.63	.60
12. Je ressens les émotions des autres / Feel others' emotions	.40	.51
7. Les problèmes des autres ne m'intéressent pas / Am not interested in other people's problems	.64	.78
17. Je ne suis pas vraiment intéressé par les autres / Am not really interested in others	.59	.89
Conscientiousness		
3. J'accomplis les tâches ménagères sans délai / Get chores done right away	.64	.66
13. J'aime l'ordre / Like order	.73	.68
8. J'oublie souvent de ranger les choses là où elles vont / Often forget to put things back in their proper place	.66	.79
18. Je suis désordonné / Make a mess of things	.87	.94
Neuroticism		
4. J'ai de fréquentes sautes d'humeur / Have frequent mood swings	.83	.80
14. Je suis facilement contrarié / Get upset easily	.77	.75
9. Je suis détendu la plupart du temps / Am relaxed most of the time	.59	.57
19. Je me sens rarement déprimé / Seldom feel blue	.68	.62
Intellect		
5. J'ai une imagination fertile / Have a vivid imagination	.71	.43
10. Je n'ai pas d'intérêt pour les idées abstraites / Am not interested in abstract ideas	.48	.56
15. J'ai de la difficulté à comprendre les idées abstraites / Have difficulty understanding abstract ideas	.40	.58
20. J'ai très peu d'imagination / Do not have a good imagination	.90	.67

Table 3.
Latent Correlations and Reliabilities from the final Confirmatory Factor Analysis model.

	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Intellect/ Imagination
Extraversion	.81	.49	.01	-.20	.25
Agreeableness	.32	.79	.02	-.06	.30
Conscientiousness	.01	.01	.86	-.13	-.15
Neuroticism	-.15	-.02	-.11	.78	-.13
Intellect/ Imagination	.14	.15	-.11	-.07	.67

Note. Correlations above the diagonal are between latent dimensions while correlations below the diagonal are between factor scores; Scale score reliabilities are reported in the diagonal based on McDonald's (1970) omega: $\omega = (\Sigma|\lambda i|)^2 / ([\Sigma|\lambda i|]^2 + \Sigma\delta ii)$ where λi are the factor loadings and δii, the error variances ($1- h^2$).

Table 4

Convergent and Criterion-Related Validity for the Mini-IPIP.

Dimensions	Neuroticism	Extraversion	Intellect	Agreeableness	Conscientiousness
BDI-II Depression	**.50**	-.22	.09	-.01	-.11
STAI Anxiety	**.62**	**-.35**	-.02	.01	-.13
SLS Life satisfaction	**-.40**	.27	-.06	.08	.11
PANAS Negative affect	**.59**	-.09	.00	.12	-.14
PANAS Positive affect	**-.38**	**.33**	.18	.09	-.02
NPI Narcissism	.12	**.45**	.07	.00	-.01
ATQ Associative sensitivity	.17	.10	**.41**	.07	-.08
TAS Externally oriented thinking	.02	-.23	-.29	.14	-.02
ECR Avoidant attachment	.21	-.25	.03	**-.31**	-.15
ECR Anxious attachment	**.53**	.14	-.01	-.02	-.02
EQ Empathy	-.16	**.35**	.18	**.61**	.12
TEQ Empathy	.01	.28	.28	**.74**	.04
UPPS Negative urgency	**.49**	-.06	-.10	-.09	-.19
UPPS Lack of premeditation	.12	.15	-.08	-.12	**-.37**
UPPS Lack of perseverance	.29	-.06	-.02	-.10	**-.39**
UPPS Sensation seeking	.04	.12	.20	-.07	**-.34**
ATQ Activation control	-.27	.17	-.01	.22	**.36**

Note. Correlations superior to .30 are in bold.

Appendix 1

Veuillez lire attentivement chaque énoncé et évaluez à quel point cet énoncé vous décrit. Entourez le chiffre approprié selon ces critères :

1 si vous êtes en total désaccord
2 si vous êtes en désaccord
3 si vous êtes ni en désaccord, ni en accord
4 si vous êtes d'accord
5 si vous êtes en total accord

1. Je suis le bout en train dans les partys.
2. Je sympathise avec les sentiments des autres.
3. J'accomplis les tâches ménagères sans délai.
4. J'ai de fréquentes sautes d'humeur.
5. J'ai une imagination fertile.
6. Je ne parle pas beaucoup.
7. Les problèmes des autres ne m'intéressent pas.
8. J'oublie souvent de ranger les choses là où elles vont.
9. Je suis détendu la plupart du temps.
10. Je n'ai pas d'intérêt pour les idées abstraites.
11. Je parle à plusieurs personnes différentes dans les partys.
12. Je ressens les émotions des autres.
13. J'aime l'ordre.
14. Je suis facilement contrarié.
15. J'ai de la difficulté à comprendre les idées abstraites.
16. J'ai tendance à rester en retrait.
17. Je ne suis pas vraiment intéressé par les autres.
18. Je suis désordonné.
19. Je me sens rarement déprimé.
20. J'ai très peu d'imagination.