

## Assessing Dispositional Empathy in Adults: A French Validation of the Interpersonal Reactivity Index (IRI)

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The goal of this study was to validate a French version of the Interpersonal Reactivity Index (IRI), a self-report questionnaire comprised of four subscales assessing affective (empathic concern and personal distress) and cognitive (fantasy and perspective taking) components of empathy. To accomplish this, 322 adults (18 to 89 years) completed the French version of the IRI (F-IRI). A confirmatory factor analysis confirmed the four-factor structure of the original IRI. The F-IRI showed good scale score reliability, test–retest reliability, and convergent validity, tested with the French version of the Empathy Quotient. These findings confirmed the reliability and validity of the F-IRI and suggest that the F-IRI is a useful instrument to measure self-reported empathy. In addition, we observed sex and age differences consistent with findings in the literature. Women reported higher scores in empathic concern and fantasy than men. Older adults reported less personal distress and less fantasy.

*Keywords:* empathy, Interpersonal Reactivity Index, French validation, adults

Empathy is a key component of social interactions by promoting prosocial behaviours while inhibiting aggressive behaviours toward others (Batson, 1991; Eisenberg, 2000). Empathy is broadly defined as the capacity to imagine, experience, and understand what the other person is feeling. For example, Decety and Lamm (2006) defined empathy as “the ability to experience and understand what others feel without confusion between oneself and others” (p. 1146). Empathy is typically conceptualised as a two-component model integrating both an affective and a cognitive

facet (e.g., Davis, 1980; Decety & Jackson, 2004). Thus, empathy refers to a phenomenon that “requires both the ability to share the emotional experience of the other person (affective component) and an understanding of the other person’s experience (cognitive component)” (Decety & Jackson, 2004, p. 73). There is empirical support for the two-component model of empathy. For example, persons with certain mental disorders show a clear dissociation between the two facets of empathy: In comparison with healthy adults, alcoholic patients showed impaired emotional empathy but preserved cognitive empathy (Maurage et al., 2011), whereas bipolar disorder patients showed higher emotional empathy and impaired cognitive empathy (Shamay-Tsoory, Harari, Szepsenwol, & Levkovitz, 2009).

Several self-report questionnaires have been developed to measure dispositional facets of empathy. Although earlier scales assessed either only the cognitive component of empathy, such as the Hogan Empathy Scale (Hogan, 1969), or only the emotional component of empathy, such as the Emotional Empathic Tendency Scale (EETS; Mehrabian & Epstein, 1972) and the Balanced Emotional Empathy Scale (BEES; Mehrabian, 1996), more recent scales tap into both affective and cognitive aspects of empathy.

Taking into account the two-component model of empathy, the Interpersonal Reactivity Index (IRI; Davis, 1980)—one of the most commonly used self-report questionnaires to assess empathic tendencies in adults—was designed to assess four 7-item subscales reflecting both affective and cognitive components of empathy: Empathic concern (EC) and personal distress (PD) represent affective aspects of empathy, whereas fantasy (FS) and perspective

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taking (PT) represent cognitive aspects. The Empathic Concern scale measures respondents' tendency to experience feelings of concern or compassion for others. Personal distress assesses the tendency to experience distress or discomfort in response to others' emotional distress. Fantasy refers to people's propensity to get involved in fictional situations and to identify with fictional characters in books, movies, or play. Finally, perspective taking assesses the ability to adopt another's perspective or point of view. By investigating associations of the IRI subscales with other measures of empathy, as well as associations with empathy-related constructs such as interpersonal functioning, self-esteem, and sensitivity to others, Davis (1983) found empirical support for the four-factor structure of the IRI. The convergent and discriminant validity of the IRI subscales have been supported by examining prosocial behaviours (Sze, Gyurak, Goodkind, & Levenson, 2011), aggressive behaviours (Mayberry & Espelage, 2007), alexithymia (Grynberg, Luminet, Corneille, Grèzes, & Berthoz, 2010), and schizophrenia (Achim, Ouellet, Roy, & Jackson, 2011; Shamay-Tsoory et al., 2007).

The IRI has been translated into different languages, including German (Paulus, 2009), Dutch (de Corte et al., 2007), Chinese (Siu & Shek, 2005), Korean (Kang et al., 2009), Spanish (Mestre, Frias, & Samper, 2004), and Swedish (Cliffordson, 2002). To our knowledge, no French validation of the IRI has been established. Thus, the aim of the present study was to translate the IRI to create the French version of the IRI (F-IRI), to confirm the four-factor structure in a large sample of French-speaking adults, and to validate the F-IRI to already-established French empathy scales, that is, the Empathy Quotient (EQ; Baron-Cohen & Wheelwright, 2004; French version, Berthoz, Wessa, Kedia, Wicker, & Grèzes, 2008). The EQ provides one score of empathy reflecting both cognitive and affective facets of empathy.

## Method

### Participants

The sample included 322 native French speakers ranging from 18 to 89 years ( $M = 49.5$  years,  $SD = 21.1$ , 59% females) recruited in the local area of Geneva, Switzerland.

From the original sample, 211 persons (18 to 87 years;  $M = 53.4$  years,  $SD = 20.5$ , 66% females) participated in a follow-up survey assessing test-retest reliability of the IRI. None of them reported a history of neurological or psychiatric disorders and none reported taking any medication. The study was performed in accordance with the ethical standards outlined in the 1964 Declaration of Helsinki. Participants received 40SFR (approximately \$44) as compensation for their participation in the study. Following ethical principles, all persons participated voluntarily after giving written informed consent.

### Measures

The 28-item IRI (Davis, 1980) was translated into French by two native French speakers who were experts in psychology and fluent in English. It was then backtranslated by a bilingual individual, and modifications were made in order to ensure that the meaning of the original items remained similar to the translated

version. The final French version of the IRI (F-IRI) was approved by the two native French speakers.

The original IRI was assessed on a 5-point scale. In order to improve scale sensitivity of the F-IRI, we used a 7-point scale ranging from 1 (*does not describe me well*) to 7 (*describes me very well*). For each subscale, mean scores were computed. A high score in one of the subscales reflects perception of higher empathic tendency in this facet of empathy.

The EQ (Baron-Cohen & Wheelwright, 2004; French version, Berthoz et al., 2008) is a 60-item questionnaire with 40 empathy items and 20 filler items. Responses were given on a 4-point scale from *strongly agree* to *strongly disagree*. The French version of the EQ shows acceptable scale score reliability, concurrent and convergent validity, and good test-retest reliability (Berthoz et al., 2008).

### Procedure

Participants completed the F-IRI and the EQ in the context of a larger project at the laboratory of the University of Geneva. The questionnaires were part of the initial background and personality assessment. For the follow-up study, participants were asked to fill out the questionnaires at home. The F-IRI and the EQ were sent by regular mail to participants after a mean interval of 12 months (ranging from 4 to 30 months).

### Data Analysis

We conducted confirmatory factor analyses (CFA) to examine the factor structure of the F-IRI. The goodness of fit was evaluated using the AMOS (version 19) computer program. Several fit indices were computed: the comparative fit index (CFI), the root mean square error of approximation (RMSEA), the standardized root mean residual (SRMR), and  $\chi^2/df$  ratio, where values of less than 3 are considered favourable in large sample analyses (Kline, 1998). For the CFI, values close to 1 are optimal and values greater than .90 indicate good fit of the model (Hu & Bentler, 1999). A value between .05 and .08 for the RMSEA would indicate a reasonable fit. Concerning the SRMR, a standardized summary of the average covariance residuals, a relatively good fit of the model is indicated when this indicator is smaller than .08 (Hu & Bentler, 1999).

## Results

Results are organized into four segments investigating (a) the latent factor structure, (b) reliability, (c) validity, and (d) group differences of the F-IRI.

### Factor Structure

To assess the factor structure of the F-IRI, we first tested two models. The first model is a one-factor model, in which the 28 items are assumed to be indicators of a single latent factor—empathy. The second model is Davis's (1980) original four-factor model.

In the one-factor model, all items were constrained to load on one single latent factor. This model produced a poor fit to the data,  $\chi^2(350) = 1897.21$ ,  $p < .01$ ,  $\chi^2/df = 5.42$ , CFI = .33, RMSEA = .120, 90% CI [.11, .13], SRMR = .14.

We then attempted to confirm the four-factor structure established in the original IRI (Davis, 1980). We specified four inter-

Table 1  
Factor Pattern Loadings of the F-IRI (28 Items)

Item	FS	PD	PT	EC
1. Je rêve régulièrement tout éveillé(e) aux choses qui pourraient m'arriver. [I daydream and fantasize, with some regularity, about things that might happen to me.]	.398	—	—	—
2. J'éprouve souvent de la tendresse pour les gens moins chanceux que moi. [I often have tender, concerned feelings for people less fortunate than me.]	—	—	—	.438
3. <sup>a</sup> Je trouve parfois difficile de voir les choses du point de vue de quelqu'un d'autre. [I sometimes find it difficult to see things from the "other guy's" point of view.]	—	—	.324	—
4. <sup>a</sup> Il m'arrive de ne pas être désolé(e) pour les gens qui ont des problèmes. [Sometimes I don't feel very sorry for other people when they are having problems.]	—	—	—	.332
5. Je m'implique vraiment dans les sentiments ressentis par les personnages d'un roman. [I really get involved with the feelings of the characters in a novel.]	.685	—	—	—
6. Dans les situations d'urgence je suis inquiet(e) et mal à l'aise. [In emergency situations, I feel apprehensive and ill at ease.]	—	.705	—	—
7. <sup>a</sup> D'habitude, je ne suis pas complètement pris(e) par les films que je regarde, je reste objectif(ve). [I am usually objective when I watch a movie or play, and I don't often get completely caught up in it.]	.538	—	—	—
8. Lors d'un désaccord, j'essaie d'écouter le point de vue de chacun avant de prendre une décision. [I try to look at everybody's side of a disagreement before I make a decision.]	—	—	.679	—
9. Quand je vois une personne dont on a profité, j'ai envie de la protéger. [When I see someone being taken advantage of, I feel kind of protective towards them.]	—	—	—	.673
10. Je me sens parfois désemparé(e) quand je me trouve au beau milieu d'une situation fortement émotionnelle. [I sometimes feel helpless when I am in the middle of a very emotional situation.]	—	.453	—	—
11. J'essaie parfois de mieux comprendre mes amis en imaginant comment ils voient les choses de leur perspective. [I sometimes try to understand my friends better by imagining how things look from their perspective.]	—	—	.646	—
12. <sup>a</sup> Il est relativement rare que je me laisse prendre par un bon livre ou un bon film. [Becoming extremely involved in a good book or movie is somewhat rare for me.]	.490	—	—	—
13. <sup>a</sup> Quand je vois quelqu'un de blessé, j'ai tendance à rester calme. [When I see someone get hurt, I tend to remain calm.]	—	.594	—	—
14. <sup>a</sup> Je me soucie très peu du malheur des autres. [Other people's misfortunes do not usually disturb me a great deal.]	—	—	—	.574
15. <sup>a</sup> Si je suis sûr(e) d'avoir raison à propos de quelque chose je ne perds pas mon temps à écouter les arguments des uns et des autres. [If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.]	—	—	.428	—
16. Après avoir regardé un film ou une pièce de théâtre, c'est comme si j'étais l'un des personnages. [After seeing a play or movie, I have felt as though I were one of the characters.]	.759	—	—	—
17. Être dans une situation de tension émotionnelle me fait peur. [Being in a tense emotional situation scares me.]	—	.451	—	—
18. <sup>a</sup> Quand je vois quelqu'un être traité de façon injuste je ne ressens pas beaucoup de pitié pour lui. [When I see someone being treated unfairly, I sometimes don't feel very much pity for them.]	—	—	—	.380
19. <sup>a</sup> D'habitude je suis plutôt efficace face aux situations d'urgence. [I am usually pretty effective in dealing with emergencies.]	—	.641	—	—
20. Je suis souvent touché(e), affecté(e) par les événements qui arrivent. [I am often quite touched by things that I see happen.]	—	—	—	.532
21. Je crois qu'il y a toujours deux facettes à chaque question ou problème et j'essaie de les prendre en compte toutes les deux. [I believe that there are two sides to every question and try to look at them both.]	—	—	.642	—
22. Je me décrirais comme une personne au cœur tendre, plutôt compatissante. [I would describe myself as a pretty soft-hearted person.]	—	—	—	.699
23. Quand je regarde un bon film, je peux très facilement me mettre à la place du personnage principal. [When I watch a good movie, I can very easily put myself in the place of a leading character.]	.822	—	—	—
24. J'ai tendance à perdre mes moyens dans des situations d'urgence. [I tend to lose control during emergencies.]	—	.772	—	—
25. Quand je suis en colère contre quelqu'un j'essaie de me mettre à sa place pendant un moment. [When I'm upset at someone, I usually try to "put myself in his shoes" for a while.]	—	—	.353	—
26. Quand je lis une histoire ou un roman intéressant, j'imagine ce que je ressentirais si les événements de l'histoire m'arrivaient. [When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.]	.629	—	—	—
27. En cas d'urgence, quand je vois quelqu'un qui a sérieusement besoin d'aide je m'effondre totalement. [When I see someone who badly needs help in an emergency, I go to pieces.]	—	.569	—	—
28. Avant de critiquer quelqu'un j'essaie d'imaginer ce que je ressentirais si j'étais à sa place. [Before criticizing somebody, I try to imagine how I would feel if I were in their place.]	—	—	.629	—

Note. F-IRI = French version of the Interpersonal Reactivity Index; FS = Fantasy factor; PD = Personal Distress factor; PT = Perspective Taking factor; EC = Empathic Concern factor.

<sup>a</sup> Denotes reversed items.



Table 4  
Age and Gender Differences for the Four F-IRI Subscales

F-IRI Subscale	Mean (SD)				Effect size <sup>a</sup>		
	Young		Old		Age	Gender	Age × Gender
	Male	Female	Male	Female			
FS	4.58 (1.16)	4.90 (1.14)	3.62 (0.97)	3.88 (1.26)	.14**	.01*	.00
PT	4.80 (0.88)	4.94 (0.97)	4.83 (0.92)	4.80 (0.86)	<.01	<.01	.00
EC	5.07 (0.94)	5.53 (0.84)	5.11 (0.94)	5.55 (0.79)	<.01	.06**	.00
PD	3.35 (0.86)	3.84 (1.18)	3.39 (1.05)	3.26 (1.16)	.01*	<.01	.02*

Note. F-IRI = French version of the Interpersonal Reactivity Index; EC = Empathic Concern; FS = Fantasy Scale; PD = Personal Distress; PT = Perspective Taking.

<sup>a</sup> Effect sizes are partial eta squared ( $\eta^2$ ).

\*  $p < .05$ . \*\*  $p < .01$ .

four-factor model was better than a one-factor model supporting the multidimensional nature of empathy (Davis, 1983, 1996). The fit of the four-factor model was also better than an alternative two-factor model distinguishing affective and cognitive aspects of empathy. Taken together, these results support the assumption that the IRI assesses more than two facets of empathy. The fit of Davis's (1980) four-factor model was, however, suboptimal. Other studies attempting to validate the factorial structure of the IRI in other languages also report moderate fit of the four-factor model. This is, for example, the case with the Chilean (Fernández, Dufey, & Kramp, 2011) and the Chinese (Siu & Shek, 2005) adaptations of the IRI. One might think of cultural differences, but such an assumption has to be better explored in further studies. Another explanation might be that changes we have made on the response scale in order to improve its sensitivity, that is, a 7-point scale instead of a 5-point scale, added fuzziness to the perception of boundaries between some items, thus affecting the fit of the four-factor model. More studies are needed to investigate further this issue.

The four subscales of the F-IRI exhibited acceptable to good scale score reliability, indicating that items in each scale correlate systematically with each other. The intercorrelations among the F-IRI subscales were also consistent with those reported by Davis (1980). Indeed, together with the significant—though moderate—correlations between the four subscales, the absence of correlations between perspective taking and fantasy, on the one hand, and empathic concern and personal distress, on the other hand, suggest that the four subscales of the F-IRI do not measure the same construct but rather measure different aspects of the same construct. These results bring further support for the validity of the F-IRI. Regarding convergent validity, consistent with previous studies (Berthoz et al., 2008; Kim & Lee, 2010), we found moderate to strong correlations between two out of four F-IRI subscales—that is, perspective taking and empathic concern—and the EQ scores. In addition, contrary to findings by Berthoz and colleagues (2008), but consistent with findings by Kim and Lee (2010), we found a negative correlation between personal distress and the EQ scores. It has been suggested that distress and empathy are driven by distinct motivational processes (Batson, 1991). According to Batson (1991), personal distress evokes egoistic motivation to reduce one's own aversive arousal, whereas empathy evokes altruistic motivation for the ultimate goal of reducing the other person's needs. Those experiencing high personal distress may then be submerged by their own aversive emotions when witnessing another person suffering, preventing them from providing an empathic re-

sponse to someone in distress. Although this ability seems to be necessary to allow resonance with someone else, a high level of personal distress may prejudice prosocial behaviours. Taken together, these results concur to support the F-IRI's concurrent validity.

Largely consistent with the literature, we observed gender and age differences in our sample. Women, in contrast to men, reported higher scores on fantasy and empathic concern, which is consistent with the recent Chilean validation of the IRI (Fernández et al., 2011). Contrary to past studies (Davis, 1980; de Corte et al., 2007), we found no gender differences for perspective taking and personal distress. This might be due to the fact that our sample covers a larger age range than other studies. For example, Schieman and Gundy (2000) found that the gender gap closes at older ages. In our sample, however, results did not display a Gender × Age interaction except for PD. Gender differences observed in our sample indicate that women, in contrast to men, are more inclined to identify with fictitious characters and experience stronger reactions of sympathy for other people undergoing negative experiences. The latter is in line with the prevailing view that females are more prosocial than males (see Moore & Eisenberg, 1984; Radke-Yarrow, Zahn-Waxler, & Chapman, 1983). This finding is consistent with a growing literature in which females score higher on care-related moral reasoning (Jaffee & Hyde, 2000), in prosocial behaviour, and on some measures of empathy/sympathy (Eisenberg & Lennon, 1983; Trobst, Collins, & Embree, 1994). In addition, women report easier identification with fictional protagonists, either female or male, than men did (Oatley, 1999). This relates to a widely reported finding that more women than men read fiction, particularly fiction that concerns relationships (Oatley, 1999), and that they generally show stronger artistic and social interests than men (Su, Rounds, & Armstrong, 2009).

Nevertheless, and consistent with earlier studies, our results showed that women had higher global scores of empathy than men (e.g., Fernández et al., 2011; Preti et al., 2011). Neuroimaging studies reported neural correlates of gender differences in empathy measures to be observable in both anatomy (Cheng et al., 2009) and neurophysiology of the human mirror-neuron system (e.g., Yang, Decety, Lee, Chen, & Cheng, 2009). However, if gender differences have often been reported on self-reported scales, studies measuring empathic accuracy in laboratory paradigms (crying in response to other crying) or physiological correlates of empathy (heart rate/pulse rate, skin conductance) are less convincing (Eisenberg & Lennon, 1983). Some authors suggest that women

perceive themselves as being more empathic than men (Zahn-Waxler, Cole, & Barrett, 1991). Consequently, one may assume that gender differences in self-reported empathy reflect motivational differences due to gender role expectation rather than women's higher levels of underlying empathy. Another possible explanation could be that women, in contrast to men, are more compliant with others' expectations. Indeed, previous studies showed a link between empathy and social desirability (Berthoz et al., 2008; Eisenberg et al., 1994; Preti et al., 2011). However, Preti and colleagues (2011) showed that gender differences in social desirability could not entirely explain women's higher self-reported empathy. Future studies would benefit from investigating more closely these issues.

We found partial evidence for age differences in two empathy subscales. Older adults reported less fantasy and less personal distress. The age difference was especially large for fantasy, suggesting that older adults are less inclined to identify with fictional characters. This may reflect a more integrated sense of self in later life that would make it less desirable or meaningful to imagine being someone else. For example, older people report significantly less introspection and concern with social approval, which may reflect an integrated sense of identity in later life (Schieman & Gundy, 2000). Another possible explanation may lie in cohort differences (Grühn, Rebucal, Diehl, Lumley, & Labouvie-Vief, 2008). Due to historical differences in the educational system and historical differences in media exposure, current older adults may have had less opportunity to read and watch fictional media than do current young adults. They may have a less-developed ability to identify with fictional characters of a story. Results also displayed a small age effect for personal distress, indicating that older adults experience less distress in witnessing others' negative experience than younger adults do. This effect was moderated by gender: Younger women showed higher personal distress than older women, whereas no significant difference was found in men. This suggests that younger women might be especially overwhelmed by others' distress. Future research would benefit from investigating this Age  $\times$  Gender interaction in personal distress further. This finding might be related to lower autonomic reactivity in older adults (Levenson, Carstensen, Friesen, & Ekman, 1991). Age-associated physiological changes may then diminish general affective arousability in old age (Gatz & Zarit, 1999; Labouvie-Vief, 1999). The observed age differences for fantasy and personal distress might be a consequence of age-related declines in executive functions (e.g., Bailey & Henry, 2008) or might simply reflect a cohort rather than an age effect (Grühn et al., 2008). Future studies are needed to examine this issue more thoroughly.

There are, however, some limitations to the present study. Indeed, although the F-IRI showed acceptable psychometric properties, the fit was not optimal. Replication with other French samples could confirm and strengthen the structural validity of the French version of the IRI. Moreover, future investigation of the psychometrics properties of the F-IRI should include additional questionnaires in order to test other aspects of the validity of the measure, such as discriminant validity. Finally, future research would benefit from adding other measures than self-reported measures of empathy or social desirability scales to investigate possible bias associated to self-report measures.

## Résumé

L'étude avait pour but de valider une version française de l'Interpersonal Reactivity Index (IRI; Index de réactivité interpersonnelle), questionnaire d'autoévaluation de quatre sous-échelles permettant d'évaluer les aspects affectifs (préoccupation empathique et détresse personnelle) et cognitifs (fantasmes et mise en contexte) de l'empathie. À cette fin, 322 adultes (de 18 à 89 ans) ont rempli la version française de l'IRI (IRI-F). Une analyse factorielle a confirmé la structure à quatre facteurs de la version originale. La version française de l'IRI-F présente une bonne fiabilité des résultats et du test-retest et une validité convergente, vérifiée au moyen du quotient d'empathie. Ces résultats confirment la fiabilité et la validité de l'IRI-F et laissent entendre que cet instrument est utile pour mesurer l'empathie autorapportée. De plus, les différences constatées entre les sexes et les tranches d'âges correspondent aux résultats indiqués dans la littérature. Les résultats des femmes sur le plan de la préoccupation empathique et des fantasmes sont supérieurs à ceux des hommes. Les adultes les plus âgés ont indiqué moins de détresse personnelle et moins de fantasmes.

**Mots-clés :** empathie, Interpersonal Reactivity Index, validation, française, adultes.

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