



# Need for Closure: Measure Adaptation to Brazil and Relation with Moral Foundations and Prosociality

## Need for Closure: Adaptação da medida ao Brasil e relação com Fundamentos Morais e Prosocialidade

## Need for Closure: Adaptación de la medida en Brasil y relación con Fundamentos Morales y Prosocialidad

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### Abstract

Need for closure (NFC) is the need people have for any type of answers on a given topic, compared to confusion and ambiguity. Despite being relevant to the study of concepts such as authoritarianism, prejudice, and hostile behaviors, its use has not been identified in the Brazilian context, and adaptation studies have not yet been carried out in the country. Therefore, this study sought to adapt and evaluate the psychometric properties of the brief NFC scale for Brazil, as well as to explore its relationship with the Moral Foundations Theory and Prosociality. The sample consisted of 427 people, aged 18 to 66 years ( $M=26.6$ ). Through Confirmatory Factor Analysis, a one-dimensional model was confirmed with adequate levels of adjustment and a good index of internal consistency ( $\alpha=0.81$ ). The measure also presented convergent and divergent validity, in addition to the Binding Moral Foundations having emerged as significant correlates, but not the prosociality measures. Finally, it was concluded that the scale presented acceptable preliminary evidence regarding the psychometric parameters and can begin to be used to assess NFC in the Brazilian context.

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## Resumo

Need for closure (NFC) é a necessidade que as pessoas têm por qualquer tipo de resposta sobre um determinado tópico, em comparação com a confusão e a ambiguidade. Apesar de ser relevante para o estudo de conceitos como autoritarismo, preconceito, e comportamentos hostis, não foi identificado seu uso no contexto brasileiro, além de ainda não terem sido realizados estudos de adaptação no país. Por isso, o presente estudo buscou adaptar e avaliar as propriedades psicométricas da escala breve de NFC para o Brasil, bem como explorar sua relação com a Teoria dos Fundamentos Morais e Prosocialidade. A amostra foi composta de 427 pessoas, de 18 a 66 anos ( $M = 26.6$ ). Através da Análise Fatorial Confirmatória, foi confirmado um modelo unidimensional com níveis adequados de ajuste e um bom índice de consistência interna ( $\alpha = .81$ ). A medida também apresentou validade convergente e divergente, além dos Fundamentos Morais Coesivos terem surgido como correlatos significativos, mas as medidas de prosocialidade não. Por fim, concluiu-se que a escala apresentou evidências preliminares aceitáveis quanto aos parâmetros psicométricos, e pode começar a ser utilizada para avaliar NFC no contexto brasileiro.

## Resumen

Need for closure (NFC) es la necesidad que las personas tienen de cualquier tipo de respuesta sobre un tema determinado, en comparación con la confusión y la ambigüedad. Si bien es relevante para el estudio de conceptos como el autoritarismo, prejuicio, y comportamientos hostiles, no ha sido identificado su uso en el contexto brasileño, además de no haber todavía ningún estudio de adaptación llevado a cabo en el país. Por esta razón, el presente estudio buscó adaptar y evaluar las propiedades psicométricas de escala breve de NFC para Brasil, así como explorar su relación con la Teoría de los Fundamentos Morales y la Prosocialidad. La muestra consistió en 427 personas, de 18 a 66 años ( $M = 26.6$ ). A través del Análisis Factorial Confirmatorio, se confirmó un modelo unidimensional con niveles adecuados de ajuste y un buen índice de consistencia interna ( $\alpha = .81$ ). El instrumento también presentó validez convergente y divergente, además de que los Fundamentos Morales Cohesivos surgieron como correlatos significativos, pero las medidas de prosocialidad no. Finalmente, se concluyó que la escala presentaba evidencias preliminares aceptables con respecto a los parámetros psicométricos, y se puede comenzar a usar para evaluar la NFC en el contexto brasileño.

**Keywords** Adaptation · Need for closure · Moral foundations · Prosociality

**Palavras-chave** Adaptação, Need for closure, Fundamentos morais, Prosocialidade.

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Since the dawn of humanity, the way in which to seek information to meet the need for certainty has helped human beings ensure the continuity of their bloodline and the survival of their species. This has happened through some adaptive behavior such as searching for stable sources of food and water, shelter, and avoiding known predators. Although nowadays the scope of the questions is different, and might even concern trivial topics like being invited to a party (e.g., “who is going to be there?”; “what is the

dress code?"; "should I bring anything?"), these evolutionary characteristics have some important motivational aspects in common: the need to know what to expect, how and when to expect it.

## The Need for Closure

In line with this primordial, biological need, Kruglanski (1990) conceptualized a cognitive-motivational aspect of decision-making named need for closure (NFC), which refers to a person's desire for "an answer on a given topic, any answer... compared to confusion and ambiguity" (p. 337). According to Roets (2017), NFC refers to the human motivation of completing the epistemic process of gathering information, generating hypotheses, and hence, reaching an answer and forming knowledge. This means individuals with a high NFC have a desire for epistemic security, independently of its content, as a way of avoiding feelings of uncertainty that may cause distress. Such need varies on a continuum that goes from a strong need for closure to a strong avoidance of closure and may vary as a function of the situation, as well as represent a dimension of stable individual differences (Webster and Kruglanski 1994).

Although not knowing the dress code for a party is not a matter of life and death, being confronted with uncertainty can be seen, for people with a strong need for closure, as an aversive and stressful situation, since those individuals are highly motivated to attain closure. Therefore, those situations can even elicit an increased heart rate, higher systolic blood pressure, and increased electroskin conductance (Roets and Van Hiel 2008). Kruglanski and Webster (1996) also propose that the need for closure expresses itself in two ways: the urgency tendency, which reflects individuals' inclination to seize information quickly in order to make judgments; and the permanency tendency, which indicate the inclination towards freezing the information acquired, in order to perpetuate the closure that has already been achieved.

So, to better assess this aspect of individual differences, it is essential to have a valid and precise measure to make the research in communities possible. Considering there is no measure to evaluate this construct in Brazil, the goal of this study was to translate, adapt, and evaluate the psychometric properties of the brief Need for Closure Scale (Roets and Van Hiel 2011b) to Brazilian Portuguese. Some constructs that have been traditionally associated with NFC and can explain some aspects of it such as right-wing authoritarianism and social dominance orientation (Roets and Van Hiel 2011b) were included in the analysis, as well as other potential correlates that have not been thoroughly studied, namely moral foundations, empathic consideration, and self-reported altruism.

## The Need for Closure Scale

Webster and Kruglanski (1994) have developed a theoretical framework that conceptualizes the NFC as a latent variable and have built a 42-item scale that expresses it through five different aspects. The first one refers to a preference for order and structure in their environment and day to day lives, such as having clear rules and schedules at

work. The second points out to the discomfort with ambiguity caused by the lack of closure and the aversion provoked by it, which leads individuals to urgently try to reach for closure of their judgments and choices, on a different aspect called decisiveness. As for the fourth aspect, it denotes people's need for stable knowledge and predictability, reflected by a will to always know what to expect whatever the situation encountered is. This need produces as a consequence the fifth aspect, close-mindedness, which refers to the unwillingness to have the predictable and stable knowledge confronted by other alternatives sources, and thus may result in not wanting to consult other opinions or in feelings of irritation when a group's consensus is defied (Roets and Van Hiel 2011b; Webster and Kruglanski 1994).

With the rise of studies investigating the need for closure, Roets and Van Hiel (2007) have revised the original version to assess it with more validity, considering that the decisiveness facet was being criticized for not measuring what it was supposed to measure. The result was a reformulated 41-item version, with new items for the facet that relate more to the need instead of the ability to decide, as it was previously designed. Later, the same authors (Roets and Van Hiel 2011b) observed that other researchers were using some parts of the scale at their own discretion, without giving information about which items were being used or their criteria, which can be problematic when trying to replicate the results. This motivated them to obtain a reduced, 15-item and one-dimensional version of the scale, that would have a good internal consistency, without losing content and predictive power, by selecting the three items in each facet with the highest factor loadings. This brief scale has been reviewed by Crowson (2013), who sought to address the original's methodological limitation using an independent sample. The findings showed results similar to Roets and Van Hiel (2011b), acknowledging its one-dimensionality and high internal consistency, and concluding that the 15-item scale does function as a reasonable alternative to the 41-item scale (Crowson 2013).

## Traditional NFC Correlates

Although NFC may serve an adaptive purpose by ensuring the organism's basic survival and likelihood of reproduction through, for example, in-group favoritism and loyalty (Kruglanski et al. 2002), enhanced feelings of solidarity towards the in-group (Orehek et al. 2010), and stable transmission of cultural norms (Livi et al. 2015), it may also lead to culturally badly regarded behaviors such as intergroup hostility (Dugas et al. 2018), authoritarianism (De Keersmaecker et al. 2017), sexism (Pica et al. 2018), and prejudice in general (Burke et al. 2017; Dhont et al. 2011; Roets and Van Hiel 2011a; Van Hiel et al. 2004).

For that reason, the 42-item scale formulated by Webster and Kruglanski (1994) to measure NFC objectively has been constantly correlated to constructs such as right-wing authoritarianism (De Keersmaecker et al. 2017; Makwana et al. 2018), which proposes that those high in that construct tend to perceive members of outgroups as a threat to the traditional values hold by the majority, as well as a personal feeling of righteousness when compared to other people (Altemeyer 1981); and social dominance orientation (Dhont et al. 2011; Van Hiel et al. 2004), a variable that measures individual differences on the extent to which people desire that one's in-group be superior to the

outgroup, and consequently the favoring of hierarchy-enhancing ideologies (Pratto et al. 1994).

## Potential NFC Correlates: Prosociality and Morality

Seeing that the motivated way of thinking induced by NFC can regulate typical expressions of authoritarianism, such as the glorification of in-group members and, in contrast, hostility towards outgroup members (Dugas et al. 2018), it is logical to assume that people with low NFC, and therefore that do not present aversion towards the unfamiliar and unpredictable would not display such behaviors. Shteynberg et al. (2017) have found that low NFC is linked to a greater concern towards the just and unjust treatment of others. Nevertheless, Gribbins and Vandenberg (2011) have not found a direct relation between NFC and helping behavior, only a moderation link with religious fundamentalism which evidenced that for people with low fundamentalism, as NFC increased, so did helping. Helping can be classified as type of prosocial behavior, described by Dovidio et al. (2017) as acts that are defined by some significant segment of society and/or one's social group as generally beneficial to other people.

On the other hand, morality provides the same sense of certainty individuals high in NFC usually yearn, by giving clear, consistent, and broadly applicable guidelines for how to behave and for how to evaluate others (Federico et al. 2016). Haidt and Joseph (2004) have categorized intuitive and emotional reactions that commonly occur in moral judgment in their moral foundations theory, that classifies moral concerns in two clusters: the individualizing foundations, regarded to concerns about caring for other people and the fair treatment of them, and the binding foundations, regarded to concerns about loyalty to the in-group, respect for authority, and purity. Seeing that variations in both moral foundations and NFC seem to be due to different sociopolitical attitudes, some authors (Baldner and Pierro 2019; De Cristofaro et al. 2019; Federico et al. 2016; Giacomantonio et al. 2017) have begun to study the relationship between these two variables and have found significant results.

## Overview of the Study

Considering the importance of NFC for the understanding of a series of social phenomena, such as authoritarianism (De Keersmaecker et al. 2017), prejudice (Dhont et al. 2011), and religious fundamentalism (Gribbins and Vandenberg 2011), the current growth in literature regarding variables that help explain expressions of prejudice, and the fact that it has not been identified any attempt at adapting and producing validity evidences of the NFC brief scale (or any of the previous scale versions) to Brazil, this study adapted the scale to Brazilian Portuguese and verified its psychometrics properties comparing to the original factorial structure from Roets and Van Hiel (2011b), through a confirmatory factor analysis, besides testing its relationship with commonly related variables (social dominance orientation and right-wing authoritarianism) and its link to prosociality and moral foundations theory through a multiple linear regression model. We believe that the NFC scale will show positive correlations to social dominance orientation, right-wing authoritarianism and the

binding foundations, and negative correlations to the individualizing foundations and the prosociality measures.

## Method

### Participants

The nonprobabilistic original sample consisted of 429 people. Two people were excluded due to being 17 years old, resulting in a 427 people sample with a mean age of 26.6 ( $SD = 9.2$ ; range = 18 to 66 years). Of this total, 61.3% were women, 46.5% were attending undergraduate school, 36.9% considered themselves to be left-wing, and 32.2% center-left. As for the religions reported, 27.5% were agnostic, 16.2% said they had another religion (candomblé, umbanda, buddhism), 16% were catholic, and 15.3% atheists.

### Measures

#### Need for Closure

The short version of the scale was used (Roets and Van Hiel 2011b), consisting of 15 items (e.g. “I don’t like situations that are uncertain”; “I enjoy having a clear and structured mode of life”), rated on a 6-point Likert scale ranging from 1 (completely disagree) to 6 (completely agree). In this study, the alpha was of 0.82 and the one-dimensional model presented adequate fit ( $RMSEA = 0.06$ ,  $SRMR = 0.13$ ,  $AGFI = 0.88$ ,  $CFI = 0.92$ ).

#### Right-Wing Authoritarianism

It is a 34-item self-report measure that assess authoritarianism stemming from beliefs associated with the political right-wing (Duckitt et al. 2010, adapted to the Brazilian context by Vilanova et al. 2018), in a Likert scale ranging from 1 (totally disagree) to 5 (totally agree), with items such as “The way things are going in this country, severe measures will be needed to straighten out the bad guys, the criminals and the perverts”. In the present study, two of the highest factor loading items from each factors were used, presenting an adequate internal consistency: Authoritarianism (AT,  $\alpha = .69$ ), Contestation to Authority (CA,  $\alpha = .75$ ), Traditionalism (TD,  $\alpha = .86$ ), and Submission to Authority (SA,  $\alpha = .78$ ), and good convergent validity with social-dominance orientation (SDO) (AT:  $r = .36$ ,  $p < .001$ ; CA:  $r = .24$ ,  $p < .001$ ; TD:  $r = .42$ ,  $p < .001$ , SA:  $r = .30$ ,  $p < .001$ ).

#### Social-Dominance Orientation

It is an attitudinal orientation that refers to the extent in which the individual desires the in-group to dominate over the out-group, with items like “Superior groups should dominate over inferior groups”. It is a 16-item scale (Sidanius and Pratto 1999, adapted to the Brazilian context by Fernandes et al. 2007). In this study we opted for using the

six items with the highest factor loadings ( $\alpha = .73$ ), and as mentioned, the scale presented a good convergent validity with right-wing authoritarianism (RWA)'s factors, as expected.

### **Moral Foundations Questionnaire**

Graham et al. (2011, adapted to the Brazilian context by Silvino et al. 2016) developed a 30-item scale with two parts: in one, the person needs to evaluate each item in terms of relevance when deciding whether something is right or wrong, rating from 1 (not relevant) to 6 (extremely relevant); and in the other, if they agree with the assertive or not, rating from 1 (strongly disagree) to 6 (strongly agree). Silvino et al. (2016) found some items retained in different factors than expected, and we followed the same approach, which presented a better fit. The individualizing facet had items like "Justice is the most important requirement for a society" and in this study presented an alpha of 0.80, and the binding facet had items such as "Respect for authority is something that all children need to learn", with an alpha of 0.88.

### **Interpersonal Reactivity Index**

The Interpersonal Reactivity Index (IRI) (Davis 1983, adapted to the Brazilian context by Sampaio et al. 2011) is an instrument that considers empathy as a multidimensional construct assessed by affective and cognitive subscales, in 28 items, using a five-point Likert scale. In this study, we opted for using the 7 items belonging to the Empathic Consideration (EC) scale (e.g., "I feel compassion when someone is treated unfairly), which presented in this study a Cronbach's alpha of 0.83 and refers to the motivation to help other people when empathic affection is felt. The scale presented convergent validity with the Battery of Prosocial Personality, indicated by its Pearson's  $r$  of 0.291 ( $p < 0.001$ ).

### **Battery of Prosocial Personality**

It is a scale elaborated by Penner et al. (1995, adapted to the Brazilian context by Rabelo and Pilati 2013), with 30 items that relate to the frequency in which people present certain behaviors (e.g., "I have offered to help a handicapped or unknown elderly person to cross the street"), rating in a 5-point Likert scale ranging from 1 (never) to 5 (very frequently). In this study, we chose to use the 5 items pertaining to the Self-Reported Altruism (SRA), which has a Cronbach's alpha of 0.74, that relates to a tendency to help people in need. A Sociodemographic Questionnaire was also used, composed of questions of sex, age, education, political stance and religion, intended to characterize the participants.

### **Data Collection Procedures**

Initially, the NFC brief scale was submitted to translation by one of the authors and another independent bilingual translator, following Borsa et al.'s (2012) recommendation of one of the translators being familiar with the construct while the other is not and does not know the study's objective, to avoid bias. Afterwards, a comparison between



both versions was made, analyzing for semantic, idiomatic, conceptual and contextual differences, with the goal of creating one single version. Once the version with a synthesis of the others was created, another independent bilingual translator back translated it, to see the extent to which the instrument reflected the content of the original English version. Then, the final, adjusted version was evaluated by specialists, but no further adjustments were required.

The data collection was carried out online for 6 months, made through the Enterprise Feedback Suite (EFS) survey platform ([ww3.unipark.de](http://ww3.unipark.de)). All measures were applied at the same time, but before answering them, the participant was asked to read the Term of Free and Informed Consent (TCLE, in Portuguese), where the objectives and procedures were explained, and then to sign it. On average, it took approximately 20 min for the participants to respond to the instruments.

### Data Analysis Procedures

Two programs were used to carry out the data analysis presented in this study, the Statistical Package for Social Sciences (SPSS), version 24, and AMOS, version 18, both for Windows. All statistical tests were carried out using a  $p < 0.05$  level of significance. Using SPSS, it was verified that the observations, except for the NFC scale, did not follow a normal distribution and therefore, nonparametric inferences were going to be needed. In addition, it was observed the presence of a single univariate outlier and five multivariate outliers which were then excluded from the analysis. The factorial structure of all the scales used were tested using Confirmatory Factor Analysis on AMOS, and all the internal consistencies were tested via Cronbach's alpha on SPSS. Hu and Bentler's (1999) cutoff values were used as criteria for choosing the most adequate factorial structure.

The original sample was divided into two randomly distributed samples, where one was used to conduct a principal component's analysis (PCA) on SPSS and Horn's parallel analysis using the Monte Carlo PCA for Parallel Analysis 2.3 Software in the NFC scale, to be in line with the analysis conducted by the original authors. The other randomized sample was used to carry out model fit tests via confirmatory factor analysis on AMOS to avoid a biased model. Afterwards, all scales had their  $z$  scores calculated, and then a hierarchical multiple linear regression analysis was carried out to investigate the predictive power of the right-wing authoritarianism and social dominance scales, the Moral Foundations Questionnaire, the battery of prosocial personality and the interpersonal reactivity index in relation to the NFC scale.

### Ethical Procedures

Since it was an online data collection, before starting answering the questionnaires, the participants had to read the first page of the form that explained the purpose of the study, the anonymity of the answers provided, the voluntary nature of the participation and the right to withdraw from the study at any time without any penalty, as well as the author's email in case of any doubts. By clicking on the "next" option, the person was stating that they were over 18 years old and that they agreed to participate in the study, which corresponded to signing the consent form.



## Results

### Factorial Structure

Initially, principal component analysis using SPSS was carried out in a random subsample with approximately 50% of the cases. Prior to principal components analysis (PCA), the suitability of the data for factor analysis was assessed, and it was observed that values for the Kaiser-Mayer-Olkin Test (KMO) and the Bartlett Test were within the expected range, at 0.80 and 940.73 respectively, with a significance of  $p < 0.001$ . In the PCA, it was verified four components had an eigenvalue superior to one. However, the first component explained 31.13% of the variance and had an eigenvalue of 4.67, whereas for the subsequent components, the eigenvalue dropped to 1.69, 1.27, and 1.14, respectively. The same pattern was observed in the scree plot (Fig. 1), where, from the 1st factor on, there is a clear break, and adding more factors would result in a low and homogeneous gain in the explained variance. On the other hand, in the Horn's parallel analysis, the eigenvalue from the generated matrix's 3rd component on had a greater value (1.29) than the sample's 3rd component eigenvalue (1.27), indicating two components should be retained.

The PCA also showed that two items (item 7 and item 14) had very low communalities (0.04; 0.01) and component loadings (0.19; 0.11). The highest value for items communality was of 0.51 and for component loadings of 0.71. Those two items did not show an important increase in the alpha if deleted but alerted us to monitor them in the confirmatory factor analysis (CFA). In this study, we opted for testing some of the

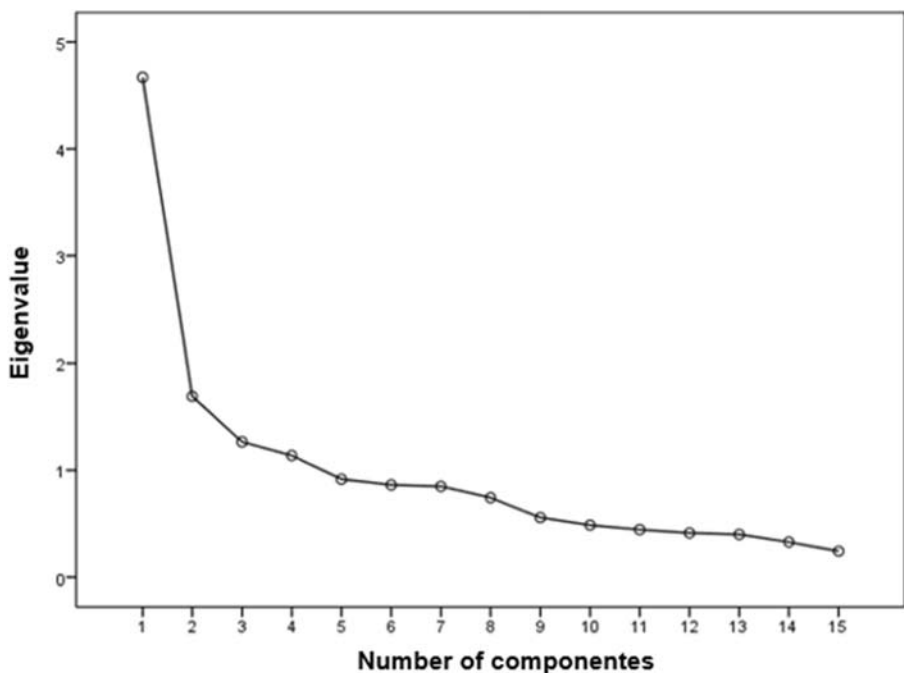


Fig. 1 Scree plot

models demonstrated in Crowson (2013), where the factorial validity of the scale was already tested, via CFA.

In Crowson's (2013) validation study of the scale, six models were tested. In this study, we tested the three models with the best fit and compared them. Model 1 (Fig. 2) consisted of one single latent variable with all items loading on it, since Roets and Van Hiel (2011b) stated that the brief scale was one-dimensional and not suitable for the assessment of individual facets. Moreover, as in the authors' approach, the error terms

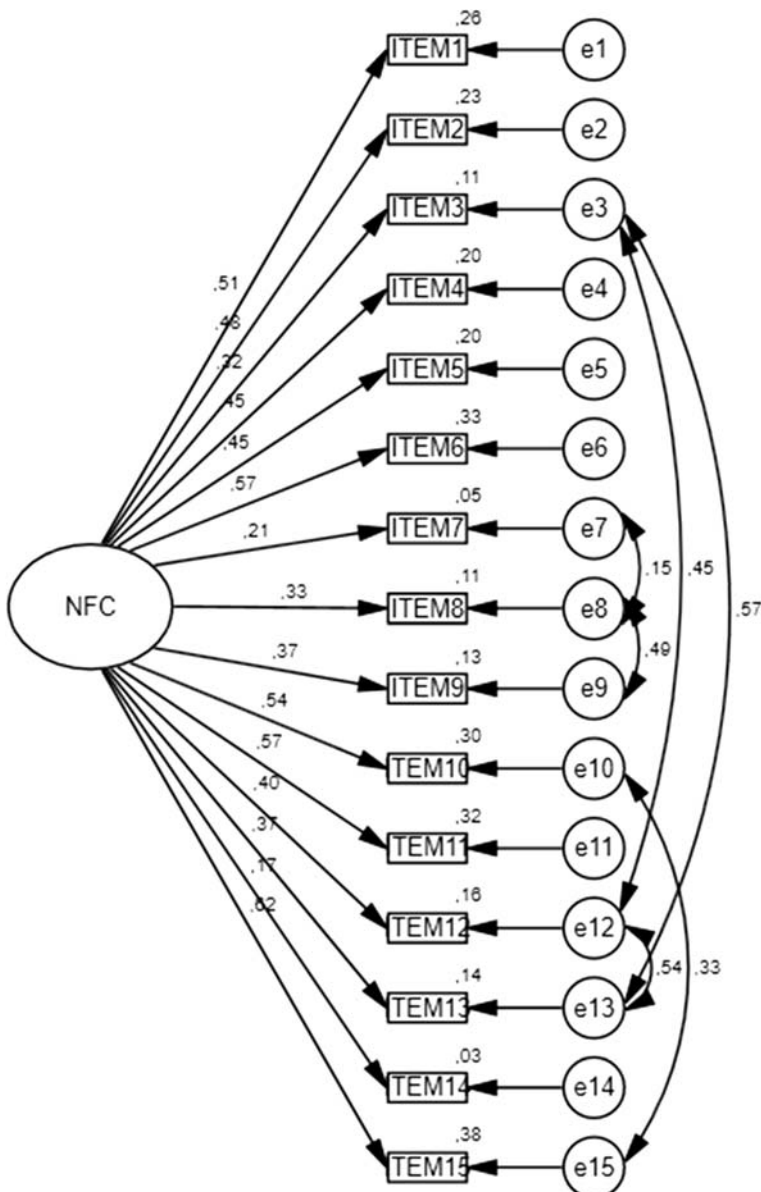


Fig. 2 Model of confirmatory factor analysis with error terms for items within the same facet correlated

for items within the same facet were allowed to correlate. Model 2 was the same one-factor model, but not allowing for correlated errors. In model 3, items were loaded into five factors that correlated into each other, following Roets and Van Hiel's (2007) model.

As shown in Table 1, model 1 had a poorer fit than the one presented in Crowson (2013), but still adequate and better than model 2, where errors did not correlate. Additionally, as can be seen in Fig. 2, the same items that demonstrated low communalities and component loadings in the PCA, also presented the lowest factor loadings in the CFA, but removing these items did not show considerable improvement in the modification indices. Model 3 also presented an adequate fit to the data, but as observed in Crowson (2013), some correlations between factors were high, which might indicate that the correlation matrix of latent factors is nonpositive definite. This led us to decide on also using model 1, with one factor and correlated errors as our factorial solution, which presented a better fit. Seeing that there was a considerable difference in the number of men and women in the sample, configural invariance was also tested using AMOS, where it was observed that the general specification of model 1 held across these groups, maintaining an adequate fit. Also, the model presented an adequate internal consistency, with a Cronbach's alpha of 0.81.

### Need for Closure's Correlates

We assessed to which extent some measures that have been previously linked to NFC could predict the variable, such as the RWA (through the AT, CA, TD, and SA facets) and SDO, and some measures we hypothesized would have a significant relation to NFC, such as prosociality (as measured by the EC and SRA scales) and the ways in which people make their moral judgments (as measured by the Moral Foundations Questionnaire (MFQ), via binding and individualizing foundations). This was tested via a four-stage hierarchical multiple regression with NFC as the dependent variable. Gender and political position were entered at stage one of the regression to control for possible effects. Traditionally associated variables (RWA facets and SDO) were entered at stage two, the prosociality scales (EC and SRA) at stage three, and the moral

**Table 1** Confirmatory factor comparison

| Model                           | SB $\chi^2$ | RMSEA | RMSEA 90% CI | CFI  | SRMR | AGFI | NNFI |
|---------------------------------|-------------|-------|--------------|------|------|------|------|
| One factor, correlated errors   |             |       |              |      |      |      |      |
| Crowson (2013)                  | 151.58      | 0.05  | 0.04, 0.06   | 0.97 | 0.05 | 0.90 | 0.96 |
| This study                      | 152.30      | 0.06  | 0.04, 0.07   | 0.92 | 0.13 | 0.88 | 0.89 |
| One factor, uncorrelated errors |             |       |              |      |      |      |      |
| Crowson (2013)                  | 648.51      | 0.12  | 0.11, 0.13   | 0.87 | 0.08 | 0.70 | 0.84 |
| This study                      | 374.05      | 0.12  | 0.11, 0.13   | 0.61 | 0.19 | 0.73 | 0.55 |
| Five correlated factors         |             |       |              |      |      |      |      |
| Crowson (2013)                  | 160.85      | 0.05  | 0.04, 0.06   | 0.97 | 0.05 | 0.90 | 0.96 |
| This study                      | 146.45      | 0.06  | 0.05, 0.08   | 0.91 | 0.13 | 0.88 | 0.88 |

For all chi-square statistics,  $p < 0.001$

foundations scales (MFQ I and MFQ B) at stage four. Table 2 shows the data relative to this regression.

**Table 2** Summary of hierarchical regression analysis for variables predicting need for closure

| Model     | B      | SE    | $\beta$ | sr <sup>2</sup> | R     | R <sup>2</sup> | $\Delta R^2$ |
|-----------|--------|-------|---------|-----------------|-------|----------------|--------------|
| Step 1    |        |       |         |                 | 0.174 | 0.030          | 0.030        |
| Constant  | 4.023  | 0.116 |         |                 |       |                |              |
| Gender    | -0.151 | 0.074 | -0.099  | -0.99**         |       |                |              |
| Political | 0.065  | 0.021 | 0.153   | 0.152*          |       |                |              |
| Step 2    |        |       |         |                 | 0.368 | 0.135          | 0.105        |
| Constant  | 3.857  | 0.146 |         |                 |       |                |              |
| Gender    | -0.131 | 0.072 | -0.086  | -0.084          |       |                |              |
| Political | 0.012  | 0.025 | 0.028   | 0.022           |       |                |              |
| AT        | 0.212  | 0.038 | 0.309   | 0.256*          |       |                |              |
| CA        | -0.074 | 0.041 | -0.096  | -0.082          |       |                |              |
| TD        | 0.028  | 0.040 | 0.042   | 0.032           |       |                |              |
| SA        | 0.107  | 0.047 | 0.123   | 0.105**         |       |                |              |
| SDO       | -0.201 | 0.081 | -0.133  | -0.113**        |       |                |              |
| Step 3    |        |       |         |                 | 0.373 | 0.139          | 0.004        |
| Constant  | 3.616  | 0.336 |         |                 |       |                |              |
| Gender    | -0.112 | 0.073 | -0.073  | -0.070          |       |                |              |
| Political | 0.014  | 0.025 | 0.033   | 0.026           |       |                |              |
| AT        | 0.210  | 0.038 | 0.306   | 0.252*          |       |                |              |
| CA        | -0.069 | 0.042 | -0.090  | -0.076          |       |                |              |
| TD        | 0.022  | 0.040 | 0.034   | 0.025           |       |                |              |
| SA        | 0.108  | 0.047 | 0.124   | 0.106**         |       |                |              |
| SDO       | -0.181 | 0.085 | -0.120  | -0.097**        |       |                |              |
| EC        | 0.072  | 0.060 | 0.063   | 0.055           |       |                |              |
| SRA       | -0.039 | 0.043 | -0.044  | -0.042          |       |                |              |
| Step 4    |        |       |         |                 | 0.406 | 0.165          | 0.025        |
| Constant  | 2.919  | 0.466 |         |                 |       |                |              |
| Gender    | -0.071 | 0.074 | -0.046  | -0.044          |       |                |              |
| Political | 0.002  | 0.025 | 0.004   | 0.003           |       |                |              |
| AT        | 0.173  | 0.039 | 0.253   | 0.201*          |       |                |              |
| CA        | -0.063 | 0.042 | -0.082  | -0.069          |       |                |              |
| TD        | -0.040 | 0.045 | -0.061  | -0.041          |       |                |              |
| SA        | 0.064  | 0.049 | 0.074   | 0.059           |       |                |              |
| SDO       | -0.119 | 0.087 | -0.079  | -0.062          |       |                |              |
| EC        | 0.040  | 0.062 | 0.035   | 0.029           |       |                |              |
| SRA       | -0.052 | 0.042 | -0.059  | -0.056          |       |                |              |
| MFQ I     | 0.113  | 0.075 | 0.084   | 0.068           |       |                |              |
| MFQ B     | 0.157  | 0.056 | 0.204   | 0.126*          |       |                |              |

*Political* identified political position; *AT* authoritarianism; *CA* contestation to authority; *TD* traditionalism; *SA* submission to authority; *SDO* social dominance orientation; *EC* empathic consideration; *SRA* self-reported altruism; *MFQ I* individualizing foundations; *MFQ B* binding foundations

\*\* $p < 0.05$

\* $p < 0.001$

Table 3 shows that although some variables correlated significantly with NFC (traditionalism, submission to authority, empathic concern, individualizing, and the binding moral foundations), only the authoritarianism facet from RWA and the binding moral foundation from the MFQ emerged as significant predictors to the NFC scale in the regression model. These results indicate that the tendency to be against civil liberties and support severe punitive measures and the extent to which their moral judgments are mostly based on binding foundations is linked to a higher degree of need for closure.

## Discussion

The present study translated and adapted to Brazilian Portuguese the short version the Need for Closure Scale (Roets and Van Hiel 2011b). Following the criteria for cross-cultural adaptation of instruments (Borsa et al. 2012), a version of the scale was created, and its psychometric properties assessed to ensure its usable condition and equivalence to the original. The internal consistency index (Cronbach's alpha) was inferior than the original's and the Crowson's (2013) reassessment of its factorial validity, which might indicate that some items had a poorer correlation amongst other items due to the translation process. Furthermore, it became apparent that a structure with one factor is more coherent when assessing NFC using this short version of the scale, as defined by model 1's better fit, in correspondence with the previous appraisal of the scale.

The same two lowest loading items in Roets and Van Hiel (2011b) and Crowson (2013), "I do not usually consult many different opinions before forming my own view" ("*Eu geralmente não consulto muitas opiniões diferentes antes de formar a minha própria opinião*") and "When I have made a decision, I feel relieved" ("*Quando eu tomo uma decisão, sinto-me aliviado*"), from the decisiveness and close-mindedness facet respectively, also had the lowest loading in this adaptation, indicating that those items may need to be reconsidered for measuring those facets. However, as mentioned, removing these items did not show an appreciable increase in the goodness of fit indexes in this study, so we have decided to maintain them in the model, so as to guarantee better comparability with previous studies.

Some divergences were found in the results between this research and the studies cited, especially regarding the Social Dominance Orientation and its negative beta and lack of significance when predicting NFC. This might be due to the differences in the measurement instruments used for assessing SDO. Since we were assessing a high number of variables in the same questionnaire, with the aim of not tiring participants, we opted for using only six items with the most factorial load in the SDO scale, which has originally 16 items, and eight items in the RWA scale (originally with 34). This decision might explain some divergences with NFC literature, and further studies in the Brazilian context should prefer using the full version of the scales.

Moreover, differences in the characteristics of the sample might have caused those divergences, since most participants were undergraduate students and considered themselves as being left-winged, unlike the other studies, which involved a more heterogeneous sample. This study also presented other limitations related to the type of sample used (nonprobabilistic), that restricts the possibility of generalization and might cause bias. Additionally, we opted for a wide age range in our sample (18 to 66 years old) in an

**Table 3** Means, standard deviations, and correlations matrix for continuous variables

|          | M      | SD    | 1       | 2      | 3       | 4       | 5        | 6       | 7      | 8      | 9       | 10 |
|----------|--------|-------|---------|--------|---------|---------|----------|---------|--------|--------|---------|----|
| 1.NFC    | 3.977  | 0.742 | –       |        |         |         |          |         |        |        |         |    |
| 2.AT     | 2.174  | 1.982 | 0.308*  |        |         |         |          |         |        |        |         |    |
| 3.CA     | 2.024  | 0.963 | 0.013   | 0.253  |         |         |          |         |        |        |         |    |
| 4.TD     | 1.535  | 1.120 | 0.130*  | 0.404* | 0.463*  |         |          |         |        |        |         |    |
| 5.SA     | 1.711  | 0.849 | 0.198*  | 0.374* | 0.284*  | 0.459*  |          |         |        |        |         |    |
| 6.SDO    | 0.1324 | 0.490 | 0.001   | 0.358* | 0.243*  | 0.419*  | 0.295*   |         |        |        |         |    |
| 7.EC     | 4.132  | 0.651 | 0.101** | −0.029 | −0.168* | −0.057  | −0.075   | −0.327* |        |        |         |    |
| 8.SRA    | 2.886  | 0.842 | 0.002   | 0.017  | −0.077  | −0.042  | −0.031   | −0.146* | 0.291* |        |         |    |
| 9.MFQ I  | 5.093  | 0.552 | 0.159*  | −0.018 | −0.189* | −0.94** | −0.086** | −0.366* | 0.459* | 0.182* |         |    |
| 10.MFQ B | 2.717  | 0.968 | 0.293*  | 0.519* | 0.366*  | 0.662*  | 0.553*   | 0.268*  | 0.014  | 0.058  | 0.093** |    |

NFC need for closure; AT authoritarianism; CA contestation to authority; TD traditionalism; SA submission to authority; SDO social dominance orientation; EC empathic consideration; SRA self-reported altruism; MFQ I individualizing foundations; MFQ B binding foundations

\*\* $p < 0.05$

\* $p < 0.001$

attempt to better represent the population; however, a smaller interval could have produced different results and should be investigated in future research.

However, the significant relation between NFC and authoritarianism was expected as an evidence of convergent validity, due to the fact that people high in NFC have a motivated way of thinking that resorts to essentialist categorization and authoritarian ideologies to satisfy their need for quick, easy, and stable knowledge about the world (Roets and Van Hiel 2011b). Besides, the support for binding moral foundations and the link to NFC is consistent with other studies (Baldner and Pierro 2019; Federico et al. 2016; Giacomantonio et al. 2017) and is explained by the fact that people characterized by the binding foundations tend to prefer the strong groups cultures and shared realities that serve as a basis for stable knowledge, and therefore, are attractive to individuals high in NFC as well. Apart from that the negative relationship between NFC and prosociality was not observed, but since prosociality is a construct highly subjected to social desirability, further studies should focus on assessing the relationship indirectly.

Furthermore, this study presented a satisfactory adaptation to the Brazilian context of the brief NFC scale, confirming its one-dimensionality, but with some limitations that might be due to the item selection from the 41-item scale to this abridged version. It would be interesting for the next studies to explore new items from the decisiveness and close-mindedness that could possibly replace the low loading items found in this and in Crowson's (2013) study. Despite that, since this is the first attempt identified by the authors of adapting the NFC brief scale to Brazil, we consider that the objective was achieved, and that the instrument presents adequate psychometric properties and therefore can start being used as a measure of this type of motivational individual difference.

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**Data Availability** The data that support the findings of this study are available to all researchers from the corresponding author upon request.

## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Ethics Approval** The research protocol was not submitted to an approving institutional review board because the committee's rules and regulations in Brazil only evaluate projects in the realm of medical and pharmacological research. Considering this situation in the current national regulations, it is not required to obtain approval from an institutional review board to conduct studies with human subjects in social sciences.

**Consent to Participate** All participants gave their informed consent prior to their inclusion in the study, informing their desire to participate and stating they were over 18 years old.

**Consent for Publication** The authors grant and assign to Springer International Publishing the exclusive, sole and permanent right to publish this manuscript.

**Code Availability** Not applicable.



## References

- Altemeyer, B. (1981). *Right-wing authoritarianism*. Winnipeg, Manitoba, Canada: University of Manitoba Press.
- Baldner, C., & Pierro, A. (2019). Motivated prejudice: the effect of need for closure on anti-immigrant attitudes in the United States and Italy and the mediating role of binding moral foundations. *International Journal of Intercultural Relations*, 70, 53–66. <https://doi.org/10.1016/j.ijintrel.2019.03.001>.
- Borsa, J. C., Damásio, B. F., & Bandeira, D. R. (2012). Adaptação e validação de instrumentos psicológicos entre culturas: Algumas considerações. *Paidéia*, 22(53), 423–432. <https://doi.org/10.1590/1982-43272253201314>.
- Burke, S. E., Dovidio, J. F., LaFrance, M., Przeworski, J. M., Perry, S. P., Phelan, S. M., Burgess, D. J., Hardeman, R. H., Yeazel, M. W., & van Ryn, M. (2017). Beyond generalized sexual prejudice: need for closure predicts negative attitudes toward bisexual people relative to gay/lesbian people. *Journal of Experimental Social Psychology*, 71, 145–150. <https://doi.org/10.1016/j.jesp.2017.02.003>.
- Crowson, H. M. (2013). Revisiting the factorial validity of the 15-item Need for Closure Scale. *Individual Differences Research*, 11(4), 133–138. [https://www.researchgate.net/profile/H\\_Crowson/publication/289021706\\_Revisiting\\_the\\_factorial\\_validity\\_of\\_the\\_15item\\_need\\_for\\_Closure\\_Scale/links/57b32ca808aaf239baf0aca.pdf](https://www.researchgate.net/profile/H_Crowson/publication/289021706_Revisiting_the_factorial_validity_of_the_15item_need_for_Closure_Scale/links/57b32ca808aaf239baf0aca.pdf). Accessed 5 May 2019.
- Davis, M. H. (1983). Measuring individual differences in empathy: evidence for a multidimensional approach. *Journal of personality and social psychology*, 44(1), 113–136. <https://doi.org/10.1037/0022-3514.44.1.113>.
- De Cristofaro, V., Pellegrini, V., Baldner, C., van Zomeren, M., Livi, S., & Pierro, A. (2019). Need for closure effect on collective action intentions and behavior toward immigrants in Italy: the mediation of binding foundations and political conservatism. *Journal of Applied Social Psychology*, 49(10), 611–622. <https://doi.org/10.1111/jasp.12620>.
- De Keersmaecker, J., Roets, A., Dhont, K., Van Assche, J., Onraet, E., & Van Hiel, A. (2017). Need for closure and perceived threat as bases of right-wing authoritarianism: a longitudinal moderation approach. *Social Cognition*, 35(4), 433–449. <https://doi.org/10.1521/soco.2017.35.4.433>.
- Dhont, K., Roets, A., & Van Hiel, A. (2011). Opening closed minds: the combined effects of intergroup contact and need for closure on prejudice. *Personality and Social Psychology Bulletin*, 37(4), 514–528. <https://doi.org/10.1177/0146167211399101>.
- Dovidio, J. F., Piliavin, J. A., Schroeder, D. A., & Penner, L. A. (2017). *The social psychology of prosocial behavior*. New York: Psychology Press.
- Duckitt, J., Bizumic, B., Krauss, S. W., & Heled, E. (2010). A tripartite approach to right-wing authoritarianism: the authoritarianism-conservatism-traditionalism model. *Political Psychology*, 31(5), 685–715. <https://doi.org/10.1111/j.1467-9221.2010.00781.x>.
- Dugas, M., Schori-Eyal, N., Kruglanski, A. W., Klar, Y., Touchton-Leonard, K., McNeill, A., Gelfand, M. J., & Roccas, S. (2018). Group-centric attitudes mediate the relationship between need for closure and intergroup hostility. *Group Processes & Intergroup Relations*, 21(8), 1155–1171. <https://doi.org/10.1177/1368430217699462>.
- Federico, C. M., Ekstrom, P., Tagar, M. R., & Williams, A. L. (2016). Epistemic motivation and the structure of moral intuition: dispositional need for closure as a predictor of individualizing and binding morality. *European Journal of Personality*, 30(3), 227–239. <https://doi.org/10.1002/per.2055>.
- Fernandes, S., Costa, J. D., Camino, L., & Mendoza, R. (2007). Psychosocial values and social dominance orientation: a study about prejudice. *Psicologia: Reflexão e Crítica*, 20(3), 490–498. <https://doi.org/10.1590/S0102-79722007000300017>.
- Giacomantonio, M., Pierro, A., Baldner, C., & Kruglanski, A. (2017). Need for closure, torture, and punishment motivations. *Social Psychology*, 48(6), 335–347. <https://doi.org/10.1027/1864-9335/a000321>.
- Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of Personality and Social Psychology*, 101(2), 366–385. <https://doi.org/10.1037/a0021847>.
- Gribbins, T., & Vandenberg, B. (2011). Religious fundamentalism, the need for cognitive closure, and helping. *The International Journal for the Psychology of Religion*, 21(2), 106–114. <https://doi.org/10.1080/10508619.2011.556999>.
- Haidt, J., & Joseph, C. (2004). Intuitive ethics: How innately prepared intuitions generate culturally variable virtues. *Daedalus: Special Issue on Human Nature*, 133(4), 55–66. <http://www.ethics-based-on-science.com/uploads/2/8/5/1/28516163/mjm-notes-intuitive-ethics-haidt-joseph.pdf>. Accessed 10 April 2019.

- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>.
- Kruglanski, A. W., & Webster, D. M. (1996). Motivated closing of the mind: ‘Seizing’ and ‘freezing’. *Psychological Review*, 103(2), 263–283. <https://doi.org/10.1037/0033-295X.103.2.263>.
- Kruglanski, A. W. (1990). Motivations for judging and knowing: implications for causal attribution. In E. T. Higgins & R. M. Sorrentino (Eds.), *The handbook of motivation and cognition: foundation of social behavior* (Vol. 2, pp. 333–368). New York: Guilford Press.
- Kruglanski, A. W., Shah, J. Y., Pierro, A., & Mannetti, L. (2002). When similarity breeds content: need for closure and the allure of homogeneous and self-resembling groups. *Journal of Personality and Social Psychology*, 83(3), 648–662. <https://doi.org/10.1037//0022-3514.83.3.648>.
- Livi, S., Kruglanski, A. W., Pierro, A., Mannetti, L., & Kenny, D. A. (2015). Epistemic motivation and perpetuation of group culture: effects of need for cognitive closure on trans-generational norm transmission. *Organizational Behavior and Human Decision Processes*, 129, 105–112. <https://doi.org/10.1016/j.obhdp.2014.09.010>.
- Makwana, A. P., Dhont, K., Akhlaghi-Ghaffarokh, P., Masure, M., & Roets, A. (2018). The motivated cognitive basis of transphobia: the roles of right-wing ideologies and gender role beliefs. *Sex Roles*, 79(3–4), 206–217. <https://doi.org/10.1007/s11199-017-0860-x>.
- Orehek, E., Fishman, S., Dechesne, M., Doosje, B., Kruglanski, A. W., Cole, A. P., Saddler, B., & Jackson, T. (2010). Need for closure and the social response to terrorism. *Basic and Applied Social Psychology*, 32(4), 279–290. <https://doi.org/10.1080/01973533.2010.519196>.
- Penner, L. A., Fritzsche, B. A., Craiger, J. P. & Freifeld, T. R. (1995). Measuring the prosocial personality. Em J. Butcher & C. D. Spielberger (Eds.). *Advances in Personality Assessment* (Vol. 10, pp. 147–163). Hillsdale: Erlbaum.
- Pica, G., Pierro, A., Pellegrini, V., De Cristofaro, V., Giannini, A., & Kruglanski, A. W. (2018). “Keeping in mind the gender stereotype”: the role of need for closure in the retrieval-induced forgetting of female managers’ qualities. *Cognitive Processing*, 19(3), 363–373. <https://doi.org/10.1007/s10339-018-0864-7>.
- Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology*, 67(4), 741–763. <https://doi.org/10.1037/0022-3514.67.4.741>.
- Rabelo, A. L., & Pilati, R. (2013). Adaptação e evidências de validade da Bateria de Personalidade Prosocial no Brasil. *Psico-USF*, 18(3), 455–468. <https://doi.org/10.1590/S1413-82712013000300012>.
- Roets, A. (2017). Three decades of need for closure research – about epistemic goals and (not) means. In C. E. Kopetz & A. Fishbach (Eds.), *The motivation-cognition interface: from the lab to the real world: A Festschrift in honor of Arie W. Kruglanski* (pp. 39–55). New York: Routledge.
- Roets, A., & Van Hiel, A. (2007). Separating ability from need: clarifying the dimensional structure of the Need for Closure Scale. *Personality and Social Psychology Bulletin*, 33, 266–279. <https://doi.org/10.1177/0146167206294744>.
- Roets, A., & Van Hiel, A. (2008). Why some hate to dilly-dally and others do not: the arousal-invoking capacity of decision-making for low- and high-scoring need for closure individuals. *Social Cognition*, 26(3), 333–346. <https://doi.org/10.1521/soco.2008.26.3.333>.
- Roets, A., & Van Hiel, A. (2011a). Allport’s prejudiced personality today: need for closure as the motivated cognitive basis of prejudice. *Current Directions in Psychological Science*, 20(6), 349–354. <https://doi.org/10.1177/0963721411424894>.
- Roets, A., & Van Hiel, A. (2011b). Item selection and validation of a brief, 15-item version of the Need for Closure Scale. *Personality and Individual Differences*, 50(1), 90–94. <https://doi.org/10.1016/j.paid.2010.09.004>.
- Sampaio, L. R., Guimarães, P. R. B., Camino, C. P. S., Formiga, N. S., & Menezes, I. G. (2011). Estudos sobre a dimensionalidade da empatia: tradução e adaptação do Interpersonal Reactivity Index (IRI). *Psico (PUCRS Online)*, 42(1), 67–76. <https://hull-repository.worktribe.com/output/2034942/estudos-sobre-a-dimensionalidade-da-empatia-traducacao-e-adaptacao-do-interpersonal-reactivity-index-iri>. Accessed 6 May 2019
- Shteynberg, G., Gelfand, M., Imai, L., Mayer, D. M., & Bell, C. (2017). Prosocial thinkers and the social transmission of justice. *European Journal of Social Psychology*, 47(4), 429–442. <https://doi.org/10.1002/ejsp.2256>.
- Sidanius, J., & Pratto, F. (1999). *Social Dominance: An Intergroup Theory of Social Hierarchy and Oppression*. New York: Cambridge University Press.

- Silvino, A. M. D., Pilati, R., Keller, V. N., Silva, E. P., Freitas, A. F. D. P., Silva, J. N., & Lima, M. F. (2016). Adaptation of the Moral Foundations Questionnaire to Brazilian Portuguese. *Psico-USF*, 21(3), 487–495. <https://doi.org/10.1590/1413-82712016210304>.
- Van Hiel, A., Pandelaere, M., & Duriez, B. (2004). The impact of need for closure on conservative beliefs and racism: differential mediation by authoritarian submission and authoritarian dominance. *Personality and Social Psychology Bulletin*, 30(7), 824–837. <https://doi.org/10.1177/0146167204264333>.
- Vilanova, F., De Sousa, D. A., Koller, S. H., & Costa, A. B. (2018). Adaptação transcultural e estrutura fatorial da versão brasileira da escala right-wing authoritarianism. *Trends in Psychology/Temas em Psicologia*, 26(3), 1299–1316. <https://doi.org/10.9788/tp2018.3-07pt>.
- Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Journal of Personality and Social Psychology*, 67(6), 1049–1062. <https://doi.org/10.1037/0022-3514.67.6.1049>.