Decisional and Emotional Forgiveness scales: Psychometric Validity and

Correlates with Personality and Vengeance

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Abstract: Forgiveness is an internal process to overcome negative aspects (e.g., anger, bitterness, resentment) towards an offender, being associated to a range of variables (e.g., well-being, quality of loving relationships, resilience). Forgiveness can happen through two different types: (1) decisional, which is a behavioural modification to reduce direct hostility; and (2) emotional, which is a transformation of negative emotions into positive. The current research aimed to gather psychometric evidences for the Decisional Forgiveness Scale (DFS) and the Emotional Forgiveness Scale (EFS), using a Brazilian sample. Two studies were conducted. In Study 1 ($n = 181$), the bifactorial structures were replicated, also providing satisfactory reliability levels. Through Item Response Theory, results indicated good discrimination, difficulty levels, and considerable information to all the items from both measures. In Study 2 ($n = 220$), confirmatory factor analyses confirmed their structure, presenting good model fit. The measures were also invariant regarding participants' gender. Finally, the measures presented significant results when correlated to personality and vengeance. In sum, the instruments demonstrated satisfactory psychometric properties, evidencing the possibility of their use in the respective context.

Keywords: Forgiveness; Emotional; Decisional; Validation.

Introduction

Many are the situations where individuals perceive others doing something wrong to them, facing a dilemma of whether or not the transgressor should be forgiven. From simple things, such as a friend pushing you when playing football, to more complex, such as a romantic betrayal, such situations are frequent. To evidence its relevance to our lives, research has shown the influence of forgiving to range of variables. For example, its importance in reducing health risks and promoting resilience (Griffin, Worthington, Lavelock, Wade, & Hoyt, 2015; Worthington & Scherer, 2004), in increasing the quality of loving relationships (Sheldon, Gilchrist, & Lessley, 2014), its association to religion and spirituality (Davis, Worthington, Hook, & Hill, 2013), and with the enhancement of well-being in interpersonal relationships (Karremans, Van Lange, Ouwerkerk, & Kluwer, 2003). Knowing the importance of forgiving, the present research aimed to provide psychometric evidences for two forgiveness measures in Brazil, also exploring their convergent validity with personality traits and attitudes towards revenge.

Forgiveness is commonly associated to the promotion of positive emotions, with outcomes for physical and mental health (Witvliet & McCullough 2007). For instance, a literature review assessed the differences in self-forgiveness and forgiving other individuals, and their relations to health (Worthington, Witvliet, Pietrini, & Miller, 2007). Self-forgiveness was found to present higher impacts on young and middle-aged people (Hall & Fincham 2005). In this type, individuals struggle with self-condemnation for something they have done to themselves or others, resulting in feelings of guilt and shame. In the other type, the lack of forgiveness towards other individuals leads to interpersonal stress, resulting in effects on physical health. In another research, forgiveness was found to be related to well-being, having this relation

mediated by factors such as healthy behaviors, social support, and existential and religious well-being (Lawler-Row & Piferi, 2006).

A common definition is that forgiveness is an internal process to overcome negative aspects (e.g., anger, bitterness, resentment, hurt) towards the offender (Worthington, 2005), that occur through a reorientation of emotions, thoughts and\or actions (Wade & Worthington, 2005). An important distinction about the types of forgiveness has been commonly incorporated to its research, with two types emerging through factorial and statistical analysis (Tucker, Bitman, Wade, & Cornish, 2015; Worthington, 2003; Worthington & Scherer, 2004): *Decisional forgiveness,* which represents a change into the behavioral intentions towards the transgressor, seeking to eliminate the negative aspects into the relationship; and *emotional forgiveness,* type that concerns the change from negative, unforgiving emotions (e.g., anger, pride), into something positive (e.g., empathy, compassion), through an affective transformation. This distinction shows a parsimonious consensus of the results on forgiveness (empirical evidence can be seen in Worthington, 2006).

These two types of forgiveness follow different processes, resulting in different consequences. The decisional, although it has the consequence of reducing the hostility, does not present direct implications for individual health, while the emotional causes the reduction of stressful reactions, because of the appearance of positive feelings. That is, as forgiveness has its roots in emotions, it also affects motivation. In this sense, while decisional forgiveness has the potential to change emotions, and eventually behavior, the emotional forgiveness directly involves changes in emotion, motivation, and cognition (Worthington, Witvliet, Pietrini, & Miller, 2007).

Several researchers have been studying how these two types of forgiveness occur, and their relations to other variables. For instance, Lichtenfeld, Buechner, Maier,

and Fernández-Capo (2015) evaluated their associations to forgetting. Manipulating the two types of forgiveness through different scenarios, the results indicated that emotional type has a greater association to forgetfulness about the transgressors actions. In a study that aimed to formulate interventions for the promotion of forgiveness (Worthington, Jennings, & Diblasio, 2010), it was noted that a cognitive decision to forgive needs to firstly occur, to then be able to replace negative emotions with positive emotions. This shows that forgiveness occurs by various means, with effects that are interdependent. The processes of how forgiveness can occur were also investigated in their neural bases, using functional magnetic resonance imaging. Results indicated that brain regions and functions were consistently activated when participants made judgments of forgiving in hypothetical scenarios (Farrow et al., 2001). Finally, cultural differences have also been found. It was observed a relation between decisional forgiveness and collectivism in cultures that this characteristic is more salient, whereas the emotional type had no affinity (Hook, Worthington, Utsey, Davis, & Burnette, 2012).

Because of their multifaceted characteristics, the distinction between decisional and emotional types provided support for an effective measurement. Two scales were developed to measure these forgiveness types (Worthington, Hook, Utsey, Willians, & Neil, 2007).

Decisional Forgiveness Scale (DFS) and Emotional Forgiveness Scale (EFS)

Five studies were conducted to develop and validity the scales (Worthington, Hook, et al., 2007). In Study 1, the measures were elaborated and refined. The results indicated a two-factor structure for both DFS and EFS, consisting of 8 items each, equally distributed among the factors. For the DFS, the factors were named *prosocial intention* (e.g., *If I see him or her, I will act friendly*), and *inhibitions of harmful intention* (e.g., *I will not seek revenge upon him or her*). For the EFS, the factors were

named *presence of positive emotion* (e.g., *I care about him or her*) and *reduction of negative emotion* (e.g., *I no longer feel upset when I think of him or her*). Both measures presented good reliability values (Kline, 2013). This bifactorial structure was further confirmed in Study 2, through structural equation modelling, with both measures presenting good model fit.

Study 3 aimed to test the temporal stability of the scales (three times, over weekly intervals), and their convergence and discrimination to other constructs. Results indicated consistency of both DFS and EFS when assessing their correlation coefficients of temporal stability, with values higher than .60. For the construct validity, the DFS and EFS were correlated with measures that were likely to present significantly results, such as empathy (DFS, $r = .46$, $p < .01$; EFS, $r = .54$, $p < .01$) and another forgiveness measure (DFS, $r = .44$, $p < .01$; EFS, $r = .36$, $p < .01$). As expected, results indicated satisfactory convergent validity. Furthermore, they showed discriminant validity with measures contrasting with forgiveness, as rumination (DFS, $r = -.17$, $p < .01$; EFS, $r = -29$, $p < .01$) and measures of motivation for interpersonal transgressions in revenge (DFS, $r = -.61$, $p < .01$; EFS, $r = -.44$, $p < .01$).

Study 4 followed an experimental design, and used a behavioural assessment of forgiveness to provide further evidence of construct validity to the measures. Participants were asked to evoke a memory of their past in which they (1) had an active grudge, (2) had made the decision to forgive but did not feel emotionally restored, (3) and made the decision to forgive, also emotionally. The results indicated emotional forgiveness as the greatest predictor of positive qualities. In addition, it was found that the decisional forgiveness is lower in a condition of grudge.

Finally, Study 5 used the Implicit Associations Test (IAT) to assess forgiveness. The IAT was used to assess the degree of decisional and emotional forgiveness by

analysing the impact on implicit cognition (for more information, see Greenwald, Nosek, e Banaji, 2003). As it is often the case in IAT measurements, respondents need to classify words, which may be congruent or incongruent. Therefore, the congruent side is expected to have faster reaction time, since incongruence delays the response due to cognitive interference. Results showed the validity of the measures, and that is appropriate to measure emotional and decisional forgiveness at an implicit level.

These five studies provided robust psychometric evidence for the *Decisional Forgiveness Scale* (DFS) and the *Emotional Forgiveness Scale* (EFS). This allowed the measures to be used in further studies, with different constructs and cultures. For example, using an Indian sample, Marigoudar and Kamble (2014) assessed gender differences in forgiveness and empathy. With a Chinese and New Zealand samples, Hook et al. (2013) examined the association between forgiveness, and collectivism and individualism. In North America, Bartholomaeus and Strelan (2016) found that the belief in a just world predicts decisional forgiveness, while Scherer et al. (2012) assessed its relations to familial perceptions of alcohol misuse. In Nepal, Watkins et al. (2011) found forgiveness as a predictor for motivations to revenge in interpersonal relationships.

Present Research

Overall, both DFS and EFS are adequate to measure their respective styles of forgiveness, being frequently applied with different constructs and contexts. Given the importance of forgiveness in human life, influencing several outcomes related to well-being (e.g., Griffin et al., 2015; Karremans et al., 2003), it is considered important to perform additional studies testing the quality of the measures in the Brazilian context, allowing to further expand the knowledge regarding forgiveness, and enabling cross-cultural comparisons. Also, these replications in different contexts are necessary

because of the differences that can emerge within and across countries (e.g., Hanel &

Vione, 2016; Henrich, Heine, & Norenzayan, 2010). Thus, these adaptations would

enhance the evidences that the DFS and EFS are reliable measures and cross-culturally

validated, offering a relevant contribution about the topic.

For that, the current research aimed to present psychometric evidence of the

measure in the Brazilian context through two studies, and using different statistical

techniques (e.g., item response theory, exploratory factor analysis, confirmatory factor

analysis, measure invariance). All the data is available on https://goo.gl/nB9gJR .

Also, to provide evidence of convergent validity to the DFS and EFS, the

measures were correlated to different variables: attitudes towards revenge, personality

traits (Big Six), and dark personality traits (Dark Triad). Research has shown that

forgiving others present a negative association to neuroticism, and positive with the

other four dimensions of the Big Five (Berrey et al., 2001; Walker & Gorsuch, 2002).

Even though personality is important for understanding individual differences in the act

of forgiving, studies are still scarce. An example of this is the lack of studies with the

dark traits. These socially aversive personality traits have been studied in different areas

(Pincus & Lukowitsky, 2010). Three types have received been given more attention:

Machiavellism, narcissism and psychopathy (Gouveia, Monteiro, Gouveia, Athayde, &

Cavalcanti, 2016). They concern manipulative behavior, a great sense of self-esteem

and a tendency to exploit others for their own benefit, respectively (Paulhus &

Williams, 2002). Of these, to the best of our knowledge, only narcissism was previously

assessed with forgiveness, presenting a negative correlation (Sandage, Worthington,

Hight, & Berry, 2000).

Method

Study 1

Participants and procedure

Participants were 181 individuals, with mean age of 30 (SD = 11.78), mostly female (64.6%). The data was collected using two methods, on-line survey (via social media), and paper and pen (in a public university). The online survey was built on Qualtrics and distributed on social networks. An e-mail address was available for all the participants to contact the researchers, in case of any doubts. A printed version of the questionnaire was used for the paper and pen data collection.

Material

Participants answered the DFS and the EMS, both developed by Worthington, Hook, et al. (2007). Both instruments are composed by eight items, equally distributed in a two-factor solution. For the DFS, the factors are inhibition of harmful intention and prosocial intention. For the EMS, the factors are presence of positive emotion and reduction of negative emotion. Participants have to rate their agreement to the items, using a five-point scale (1 = *Disagree strongly*; 5 = *Agree strongly*).

Data Analysis

To perform the statistical analysis, the "R" software was used (R Development Core Team, 2015), using several packages. The Principal Axis Factoring (PAF), as well as its indices were undertaken with the *Psych* and *nFactors* statistical packages (Raiche, Walls, Magis, Riopel, & Blais, 2013; Revelle, 2013). The reliability of the measures was investigated through the *userfriendlyscience* package (Peters, 2016). The Multidimensional Item Response theory (MIRT) package (Chalmers, 2012) was used for the psychometric properties of discrimination, thresholds, and informative curves for the individual items and the full measure. In these analysis, the Graded Response Model was used, due the polytomous answer scale (more than two categories; Samejima, 1968).

Results

Exploratory factor analysis (EFA)

Before performing the EFAs, we assessed the sample adequacy, adopting the Kaiser-Meyer-Olkin (KMO) criterion and Bartlett's sphericity test. They must be above .60 and statistically significant, respectively (Tabachnick & Fidell, 2013). Results were satisfactory both for the DFS [KMO = .80; Bartlett, $\chi^2(28) = 521.9$, $p < .001$], and EFS [KMO = .77; Bartlett, $\chi^2(28) = 537.40$, $p < .001$]. Four of the five criteria used to determine the number of factors to extract (Kaiser, Cattel, Horn, Optimal Coordinates and Acceleration Factor) pointed to a two-factor solution for the DFS, while all of them also pointed a bifactorial structure for the EFS. Then, PAFs were performed, using varimax rotation and considering items with loadings above |.40| (Table 1).

[TABLE 1 HERE]

Reliability

In addition to the reliability results for each factor (Table 1), we also assessed the values for the complete instruments. For the DFS, the results were above the recommended by the literature (> .70; $\omega = .77$ and $\alpha = .80$; Kline, 2013). For the EFS, despite one of the factors (Reduction of Negative Emotion) presenting a value slightly below the recommended (.67; Table 1), the reliability levels were satisfactory for the complete instrument ($\omega = .71$ and $\alpha = .70$; Kline, 2013).

Item Response Theory

First, the Item discrimination (*a*) was assessed (Table 2). This parameter represents the items' ability to discriminate between individuals varying in the latent trait. Following Baker's (2001) classification, six items were very highly discriminative (a > 1.7) and two highly discriminative (a between 1.35 and 1.69) for the DFS. For the EFS, five items were very highly discriminative, while three were moderately discriminative (a between 0.65 and 1.34).

After, the items' difficulties were assessed (b1-b4; Table 2), which estimates the level of the latent trait that need to be endorsed to make the individual select the next higher response category. Items are recommended not be too easy or too difficult (e.g., means across b's between 0 and +\-1.5; Rauthmann, 2013). Some items in the DFS showed values slightly above the recommended, but as these items showed very highly discrimination and good results in previous analysis (e.g., exploratory factor analysis), their maintenance is justified. All the other items were distributed among the recommended values.

[TABLE 2 HERE]

The Item Information Curves (ICC; Figure 1) indicate the ammount of information an item shares with the full measure (Castro, Trentini, & Riboldi, 2010), with higher I(θ) values indicating more informative items. Items 04 and 06 were the most informative for the DFS (In black) and the EFS (In blue), respectively.

[FIGURE 1 HERE]

The Test Information Curves (TIC; Figure 2) present the amount of information of all items summed. More information indicates a more reliable measure, with information of 10 being similar to a Cronbach's' alpha of .90 (Cappelleri, Jason Lundy, & Hays, 2014). The TCIs suggest a reasonable spread of discrimination across the latent traits, for both DFS and EFS.

[FIGURE 2 HERE]

Study 2

Participants and procedure

Participants were 220 individuals, with mean age of 28.94 (*SD* = 11.52), mostly female (65.9%). The procedure used in this study was the same as in Study 1.

Material

Participants answered a questionnaire with several measures that were part of a wider project. Due the purposes of this study, we only considered the DFS, EFS, the demographic questionnaire, and three other measures to provide evidences of convergent validity. The measures were:

Vengeance scale – Short version (*VS-10*; (Coelho et al., 2018; Stuckless & Goranson, 1992)*. Consisted by ten items (e.g., *It is always better not to vengeance*; *I don't just get mad, I get even*), it measures individuals' attitudes towards revenge. It is answered using a seven-point scale (1 = *Disagree Strongly; 7 = Agree Strongly*), and participants indicate their level of agreement to the items.

Dirty Dozen Scale (Gouveia, Monteiro, Gouveia, Athayde, & Cavalcanti, 2016; Jonason & Webster, 2010). Consisted by 12 items (e.g., *I tend to lack remorse; I tend to exploit others towards my own end*), it measures the Dark Triad of personality (narcissism, Machiavellianism, and psychopathy). Participants indicate to what extent the items describe them, using a five-point scale (1 = *Strongly Disagree*; 5 = *Strongly Agree*)

International Personality Item Pool-6 (Sibley et al., 2011). Consisted by 24 items (e.g., *I feel others' emotions*; *I get upset easily*), the instrument measures the Big Six personality factors (extraversion, agreeableness, conscientiousness, neuroticism, openness to new experiences, and honesty-humility). It is answered using a seven-point scale (1 = *Very Inaccurate*; 7 = *Very Accurate*), indicating to what extent the items describe them.

Data Analysis

All the analyses were performed in R, using *Lavaan* package (Rosseel, 2012). To confirm the measures structures, we performed Confirmatory Factor Analysis (CFA), using the Robust Maximum Likelihood (MLR) estimator. The following indices

were considered to evaluate the quality of the measures (Hair, Black, Babin, & Anderson, 2015; Tabachnick & Fidell, 2013): (1) Chi-square ($\chi 2$), which must be non-significant; (2) Comparative fit index (CFI) and (3) Tucker-Lewis Index (TLI), which require to be higher than .90; and (4) Root mean square error approximation (RMSEA), which must be lower than .10. For model comparisons, the Akaike information criterion (AIC) and Bayesian information criterion (BIC) were considered. Lower values for those indices indicate a better model fit.

To assess the invariance of the measures, Multigroup CFA were performed, considering the gender of the participants. Check measurement invariance is important to check whether participants answer the measure in the same way. For that, three models were considered (Damásio, 2013; Milfont & Fischer, 2010): (1) Configural invariance, which indicates if the structure is invariant across groups; (2) Metric invariance, which checks whether the groups answer the items in the same way; and (3) Scalar invariance, which indicates if the observed scores are related to latent scores. Other models can be included in the invariance test, but these three levels are enough to assess invariance (Milfont & Fischer, 2010). For the MGCFA, the following indices were considered: ΔCFI and ΔRMSEA, which must be equal or below .010 and .015, respectively (Chen, 2007).

Finally, to provide evidence of convergent validity of the measure, Pearson's r correlations were performed. For that, both DFS and EFS were correlated one to the other, and with other measures.

Results

Confirmatory Factor Analysis (CFA)

To confirm the structures, CFAs were performed. In addition, alternative one-factor models were evaluated, for comparison reasons. All the indices were satisfactory

for the two-factors models (Table 3), while the one-factor models presented poor results. When comparing the AIC and the BIC, the results for the two-factor models were also lower, indicating the preference for their use. In both measures all the factorial weights (lambdas) were statistically different from zero ($\lambda \neq 0$; z > 1.96, $p <$ .05), varying between -.68 (Item 3) and .92 (Item 6) for the DFS, and between -.81 (Item 3) and .92 (Item 6) for the EFS. The final structures can be seen in Figure 3.

[TABLE 3 HERE]

[FIGURE 3 HERE]

Factorial Invariance

After, we tested measurement invariance across participants' gender, using three different levels of invariance (Configural, metric and scalar). When the invariance is achieved across these three models, it allows to perform analysis that assess meaningful comparison across the groups considered. Results (see Table 4) suggest full invariance for both measures, as all the results were as recommended for the three levels. That is, the model fit did not decrease when loadings and intercepts were forced to be invariant, and thus suggesting similarity across gender.

[TABLE 4 HERE]

Reliability

As in Study 1, we assessed the reliability of the measures, for each factor and their overall. For the DFS, both factors presented results above the recommended (IHI, ω and α = .86; PI, ω and α = .73, Kline, 2013). For the EFS, one factor presented a reliability above the recommended (PE, ω and α = .90), while other was slightly below (RE, ω = .69, α = .67). For the overall, both measures presented good reliability (DFS, ω = .78, α = .80; EFS, ω = .74, α = .73).

Convergent validity

Due the relations between the variables, it is expected a positive correlation across the factors. Prosocial intention presented significant correlation with presence of positive emotion ($r = .52$, $p < .01$) and reduction of negative emotion ($r = .34$, $p < .01$). In the same direction, inhibition of harmful intention also presented significant correlations with these two factors ($r = .18$ and $.36$, $p < .01$, respectively). Also, correlations with attitudes towards revenge, the Big Six, and Dark Triad were performed, presenting significant results (Table 5).

<center>**[TABLE 5 HERE]**</center>

Discussion

This research aimed to validate the Decisional and Emotional forgiveness scales in Brazil, providing psychometric evidence through a range of techniques (e.g., item response theory, exploratory factor analysis, confirmatory factor analysis. These validations will contribute to the study of the topic in the context, and allow cross-cultural comparisons considering Brazil. The main results are discussed as follow.

Structure and items parameters

In Study 1, the items were assessed through item response theory, where most of them were described as highly discriminative, with adequate level of difficulty (Rauthmann, 2013), and showing considerable information for their respective full measures. Regarding their structure, exploratory factor analysis showed that both measures presented the expected distribution, with two factors and eight items equally distributed in each scale. All items presented loadings above the minimum stablished (|.40|), and the reliability levels (McDonald's omega and Cronbach's alpha) were good for both measures. Confirmatory factor analysis showed good model fit for both measures in Study 2, confirming the two-factor solutions for Brazil.

Factorial Invariance

Measurement invariance regarding participants' gender were assessed for both measures. They were evaluated comparing the results across three different levels (Configural, metric, scalar) of measurement, which is essential to check if correlations and means can be compared (Chen, 2007; Davidov, Meuleman, Cieciuch, Schmidt, & Billiet, 2014). Results showed that the measures are fully invariant (thus, achieving invariance in the scalar level). These indicates that the measures were interpreted in a conceptually similar way by both men and women, allowing to preform analysis that look for gender differences. Nonetheless, it would be useful to conduct further research on the measurement invariance of forgiveness across other relevant variables such as education, religious orientations, and age.

Convergent validity

For the convergent validity, the measures of DFS and EFS were correlated one to another, and to measures of personality and vengeance. As expected, both factors from the DFS were significant and positively correlated with the factors from EFS. In this case, it is shown that the measures are directed to the same latent structure, but due forgiveness multi-facet, it is necessary to assess each dimension separately.

As expected, all the factors from DFS and EFS were negatively correlated with vengeance. The construct can be defined as "*the infliction of harm in return to perceived wrong*" (Stuckless & Goranson, 1992, p. 25), thus, reflecting individuals that have no interest in reducing the emotions related to resentment, or negative thoughts towards the offender (Wade & Worthington, 2005; Worthington, 2005).

Also, both DFS and EFS presented significant and negative correlations to the Dark Triad of personality. These traits are characteristic of individuals that have malevolent qualities, such as lack of empathy, pride, manipulation, antisocial behavior, and remorselessness (Jonason & Webster, 2010). Thus, based on these characteristics

that underlie the dark traits, it seems reasonable to expect individuals that score highly in these traits to present little or no disposition fo commit a positive act.

DFS presented significant and positive correlations to three factors of the Big Six: agreeableness, conscientiousness, and honesty-humility. These personality traits are typical in individuals who are compassionate, cooperative, and fair towards others, and who tend to be efficient and impartial across situations (Sibley et al., 2011). EFS was positively correlated with honesty-humility and negatively correlated with extraversion and neuroticism. Neurotic individuals tend to frequently experience negative emotions, such as depression, and anger, which would explain its negative association with EFS (DeYoung et al., 2010). Extraversion is characteristic for individuals who tend to experience positive emotions and who are more sociable. However, other studies have found either positive relations between forgiveness measures and extraversion (Brose, Rye, Lutz-Zois, & Ross, 2005; Neto, 2007) or no significant relations (Ashton, Paunonen, Helmes, & Jackson, 1998; Walker & Gorsuch, 2002). One possible explanation is that extraversion is commonly associated with the Dark Triad of personality, especially with narcissism and psychopathy (Paulhus & Williams, 2002), and with the agentic aspect of grandiose narcissism (Miller, Lynam, Hyatt, & Campbell, 2017; Paulhus & Williams, 2002). Our data also replicate these correlations between extraversion and the Dark Triad, which can help to understand its negative correlation with EFS.

Final remarks, future studies and discussion

In scientific research it not possible to control for all the possible limitations. In the present research, the main limitation is the non-probabilistic sample (convenience), which reduces the generalization power of our results. Even with this limitation, it is important to highlight that the main objective was achieved, providing psychometric

evidence for the measures in Brazil, allowing us to use them in further studies. In this way, future studies can focus on a diagnostic adaptation of the measures. In Brazil, there is no psychological test for this purpose, according to the Psychological Testing System (SATEPSI) of the Federal Council of Psychology (CFP, regulator of the profession in the country). The advance occurs in the direction of assisting the clinical professionals in the elaboration of the diagnosis and implementation of therapeutic intervention. In addition, it can assist in the development of research in the perspective of positive psychology, aiming to evaluate the relationship with happiness, well-being and quality in mental health. Also, the relations to personality can be further explored, controlling to see the disposition to forgive in individuals that highly score in different traits.

As shown, the relevance of forgiveness to our daily life, and consequently for research, is unquestionable. Assessing the trans-cultural properties of the measures is important, providing more evidences to their reliability and structure. Also, applying them into different contexts help to expand the studies about forgiveness, and provide more knowledge regarding its relations to a range of variables, such as personality and vengeance, as in this research. Thus, as results shown strong psychometric properties, it is ensured the possibility of application of the measures in the Brazilian context, benefiting future studies.

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APPENDIX

Decisional Forgiveness Scale - Portuguese

INSTRUÇÕES: Pense sobre as suas intenções atuais em relação a uma pessoa que o(a) magoou. Indique o quanto você concorda ou discorda com cada uma das frases a seguir.

1	2	3	4	5
Discordo Totalmente	Discordo	Nem Concordo, Nem Discordo	Concordo	Concordo Totalmente

01. Pretendo magoa-lo(a) da mesma forma que ele(a) me magoou.
02. Não tentarei ajudá-lo(a) se ele(a) precisar de algo.
03. Se eu encontrá-lo(a), agirei amigavelmente.
04. Tentarei me vingar dele(a).
05. Tentarei agir em relação a ele(a) da mesma forma que agia antes dele(a) me magoar.
06. Se houver uma oportunidade de me vingar dele(a), irei aproveitá-la.
07. Não falarei com ele(a).
08. Não procurarei me vingar dele(a).

Emotional forgiveness scale - Portuguese

INSTRUÇÕES: Pense sobre as suas emoções atuais em relação a uma pessoa que o(a) magoou. Indique o quanto você concorda ou discorda com cada uma das frases a seguir.

1	2	3	4	5
Discordo Totalmente	Discordo	Nem Concordo, Nem Discordo	Concordo	Concordo Totalmente

01. Me importo com ele(a).
02. Não me sinto mais chateado(a) quando penso nele(a).
03. Sinto-me amargurado(a) com o que ele(a) fez para mim.
04. Sinto simpatia por ele(a).
05. Estou louco(a) com o que aconteceu.
06. Gosto dele(a).
07. Fiquei ressentido(a) com o que ele(a) fez para mim.
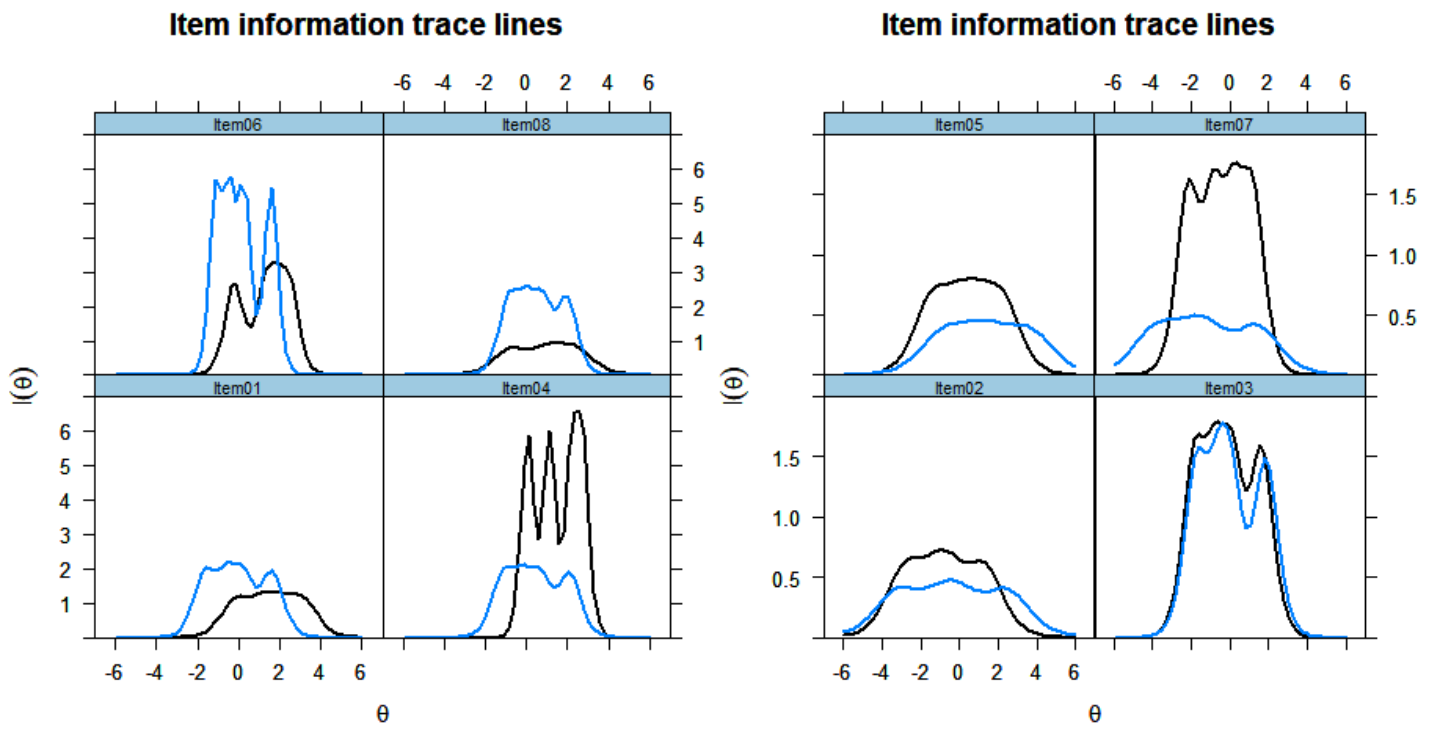08. Sinto amor em relação a ele(a).

Figure 1. IIC for Decisional (Black) and Emotional (Blue) forgiveness Factors.
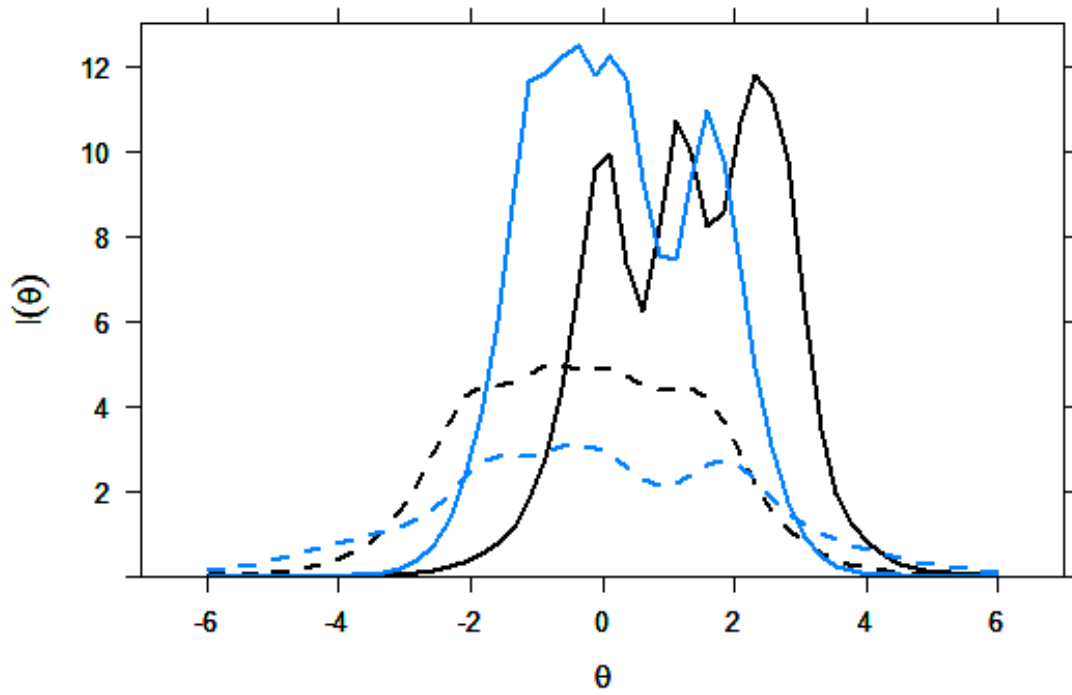
Figure 2. TIC for Decisional and Emotional Forgiveness factors. Inhibition of Harmful Intention = Black; Prosocial Intention = Black (Dashed); Presence of Positive Emotion = Blue; Reduction of Negative Emotion = Blue (Dashed).
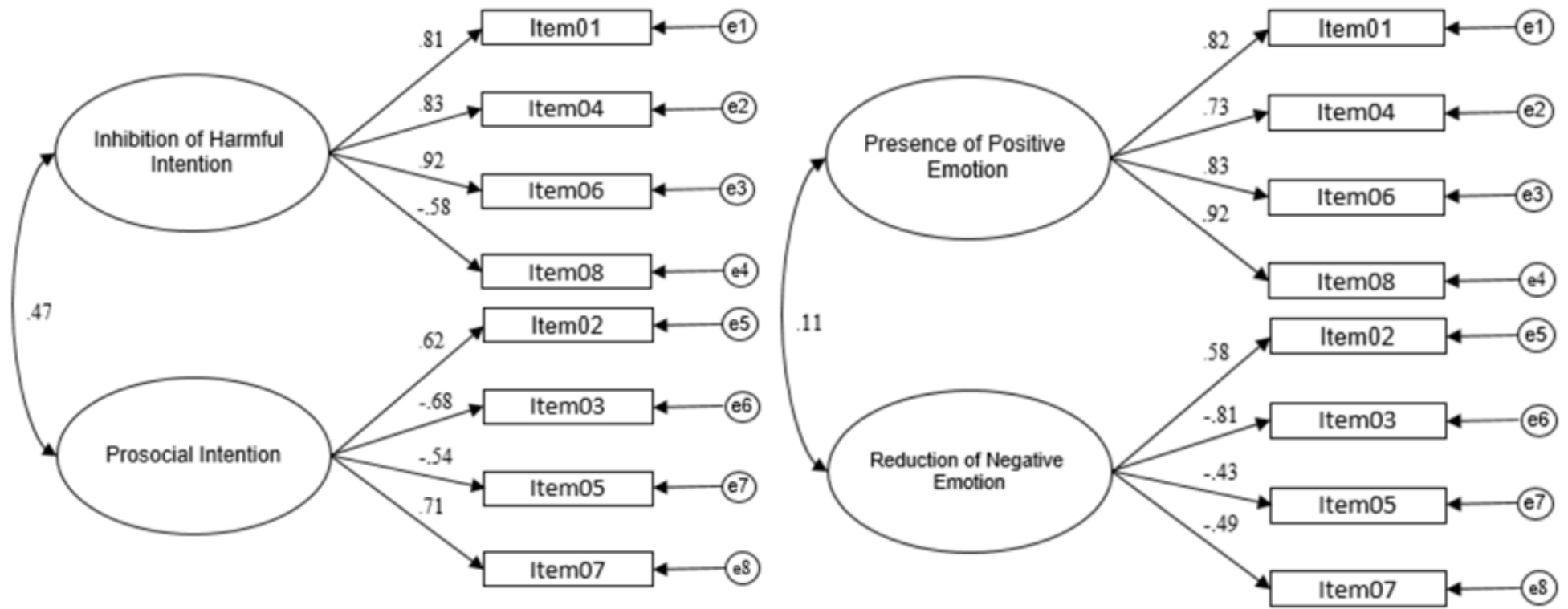
Figure 3. Decisional and Emotional structures.

Table 1

Factor Structure of the Decisional Forgiveness Scale.

	Loadings					
Items	*Decisional*			*Emotional*		
	IHI	PI	h²	PE	RE	h²
Item01	.66*	.22	.48	.79*	.00	.63
Item04	.82*	.12	.69	.79*	-.07	.63
Item06	.83*	.16	.72	.88*	-.01	.77
Item08	-.55*	-.09	.41	.81*	.08	.67
Item02	.38	.56*	.45	.24	-.53*	.33
Item03	-.04	-.77*	.60	.05	.73*	.54
Item05	-.10	-.62*	.40	.11	.54*	.30
Item07	.19	.75*	.59	.00	.50*	.25
Number of items	4	4		4	4	
Eigenvalues (Rotated)	2.28	1.95		2.75	1.37	
Explained variance (Rotated)	29%	24%		34%	17%	
McDonald's omega (ω)	.80	.79		.89	.67	
Cronbach's alpha (α)	.80	.79		.89	.67	

Note. IHI = Inhibition of Harmful Intention; PI = Prosocial Intention; PE = Presence of Positive Emotion; RE = Reduction of Negative Emotion; h² = Communalities; * = Loadings above the expected; (R) = Reverse items;

Table 2

Item parameters of the DFS and EFS.

	Decisional					Emotional				
Item	*a*	*b₁*	*b₂*	*b₃*	*b₄*	*a*	*b₁*	*b₂*	*b₃*	*b₄*
Fac. 1										
Item01	2.119	-0.156	1.097	2.016	3.119	2.771	-1.655	-0.619	0.207	1.628
Item04	4.878	0.053	1.124	2.244	2.736	2.739	-1.144	-0.238	0.670	2.093
Item06	3.301	-0.222	1.320	1.838	2.447	4.667	-1.098	-0.445	0.254	1.583
Item08	-1.740	2.436	1.497	0.937	-0.759	3.012	-0.859	-0.025	0.772	1.966
Fac. 2										
Item02	-1.544	1.276	-0.473	-1.297	-2.843	-1.253	2.455	0.019	-0.994	-3.217
Item03	2.506	-1.811	-0.772	0.117	1.657	2.436	-1.712	-0.568	-0.001	1.883
Item05	1.626	-1.444	-0.088	0.988	2.173	1.211	-0.804	0.709	1.869	3.668
Item07	-2.503	1.192	0.226	-0.842	-2.162	1.274	-3.809	-2.070	-1.116	1.446

Note. a = discrimination; $b_1 - b_4$ = threshold; items in bold are selected for the final version; Factor 1: Decisional = Inhibition of Harmful Intention, Emotional = Prosocial Intention; Factor 2: Decisional = Presence of Positive Emotion, Emotional = Reduction of Negative Emotion.

Table 3

Model fit indices – DFS and eFS

Models	χ²(g.l.)	CFI	TLI	RMSEA (IC90%)	AIC	BIC
Decisional						
One-Factor	147.65(20)	.75	.65	.170 (.146-.196)	4713.54	4794.99
Two-Factor	38.71(19)	.96	.94	0.06 (.037-.100)	4601.47	4686.31
Emotional						
One-Factor	159.30(20)	.75	.65	.18 (.154-.203)	4888.07	4969.52
Two-Factor	54.27(19)	.94	.91	.09 (.065-.120)	4769.24	4854.08

Table 4

Measurement equivalence of the DFS across gender.

Models of Invariance	CFI	RMSEA	ΔCFI	ΔRMSEA
Decisional				
Configural	.939	.090		
Metric	.941	.082	.002	-.008
Scalar	.935	.081	-.006	-.001
Emotional				
Configural	.911	.111		
Metric	.908	.105	-.003	-.006
Scalar	.913	.096	.005	-.009

Note. Δ = differences between the current and the previous model.

Table 5.

Correlations between DFS and EFS, with Big Six and vengeance.

	IHI	PI	PE	RE
Vengeance	-.78**	-.34**	-.25**	-.35**
Dark Triad				
Machiavellianism	-.247**	-.148*	-.054	-.136*
Psychopathy	-.262**	-.205**	-.204**	-.139*
Narcissism	-.112	-.148*	-.081	-.200**
Big Six				
Extraversion	-.103	-.034	-.182**	.055
Agreeableness	.235**	.141*	.107	.110
Conscientiousness	.208**	-.018	-.036	.102
Neuroticism	-.111	-.058	.069	-.254**
Openness	-.050	-.040	-.035	.001
Honesty-humility	.347**	.202**	.111	.187**

Note. IHI = Inhibition of Harmful Intention; PI = Prosocial Intention; PE = Presence of Positive Emotion; RE = Reduction of Negative Emotion; * $p < .05$; ** $p < .01$.