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Chapter

Negative Urgency and Its Role in the Association between Image Distorting Defensive Style and Reactive Aggression

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Abstract

Although the association between immature defensive styles to protect oneself from conflict in emotional context and reactive aggression (RA) has been shown recently among nonclinical individuals, the factors that may explain this relationship remain poorly understood. One putative factor is negative urgency as impulsive individuals tend to react aggressively in emotional contexts. This study aims to verify whether the relationship between image distorting defensive style and RA is moderated and not mediated by negative urgency of trait impulsivity. Nonclinical participants completed the Defensive Style Questionnaire, the UPPS Impulsivity Behavior Scale, and the Reactive-Proactive Aggression Questionnaire. Contrary to what was expected, the results showed that the relationship between image distortion and RA was entirely mediated but not moderated by the effect of negative urgency. These results suggest that when individuals get in a defensive state leading to a distortion of the image of themselves and others, they become more emotionally impulsive, leading to RA.

Keywords: impulsivity trait, reactive aggression, defensive style, moderation, mediation, negative urgency

1. Introduction

Aggressive behavior has an evolutionary root, sometimes adapted, sometimes maladapted, which has kept its place in the development of society and humans through natural selection, not to mention its main function of survival. Through the conceptualization of aggression, several variants have been defined, including reactive aggression (RA). The latter is known to manifest itself in response to a frustrating situation or a provocation. It is characterized by a hostile and protective response [1]. In other words, RA is commonly described as impulsive and unplanned. It usually occurs when experiencing negative feelings [2]. In addition, this type of behavioral reaction constitutes the main type of aggression [3]. RA can oppose proactive aggression, which is a type of intentional aggression regulated by external reinforcers. The conceptualization of RA is central to the integrative cognitive model of RA [4], which

states that individuals who are more emotionally reactive and who present high anger traits tend to interpret ambiguous social situations as hostile. The cognitive origins of RA seem to come from certain difficulties in information processing, according to the Social Information Processing model of Crick and Dodge [1]. According to Raine and Dodge [5], deficits like these could stem from symptoms underlying perceptual cognitive functions in the schizotypal personality type, such as reference ideas, unusual perceptual experiences, and paranoid ideation. This is what the results of their study demonstrate: reactive children have salient characteristics of the spectrum of schizophrenia and tend to be more impulsive and anxious [5]. An abusive environment, including child abuse and difficult parenting, as well as temperamental traits, such as impulsiveness, hostility, anger reactivity, emotional dysregulation, and anxiety, can be strongly linked to RA (Vitaro and Brendgen [6] seen in Maneiro and Cutrín [7]). An important psychological mechanism contributing to RA is response inhibition [8]. Several studies on reactive aggressive adolescents have highlighted a deteriorated response inhibition in them (Zhang et al. [9], Hecht and Lutzman [10], seen in Sun et al. [8]). Additionally, from a neurological perspective, RA appears to be correlated with amygdala size [11], a key region in the negative emotion processing [12]. A meta-analysis by Mincic [13] and data from structural magnetic resonance imaging demonstrate a more accurate picture of this link by arguing that the size of the right amygdala is well correlated with negative emotion processing [11]. All in all, and in accordance with several existing theoretical frameworks, it seems that RA is a complex phenomenon that finds its roots in a diffuse system of psychosocial, biological, and cognitive factors.

The hierarchical classification of defense mechanisms by Vaillant [14] is one of the most recognized attempts to classify the different defense mechanisms. This classification is divided into four distinct categories of defenses: 1) psychotic, 2) immature, 3) neurotic, and 4) mature. Within this categorization, it is possible to subdivide immature defenses into two different categories, namely depressive and non-depressive defenses. It is within the depressive ones that we find the defense mechanisms associated with the images distorting defensive style [15]. As for the minor defenses, it is a question of temporarily reinforcing the self-image by the abstraction of any threatening material for the individual to protect the self from negative and devaluing feelings, such as low self-esteem or a feeling of weakness. However, these distortions are not as diffuse as those present in major defenses and do not increase adaptation to stressors [16]. In return, the major defenses allow the protection of the self against intolerable anxiety at the moment when the anxiety-provoking objects are activated (e.g., the threat of being punished, abused, or killed). Subsequently, the individual processes these distortions as being consistent with his/her own subjective perception. On the other hand, simplifying oneself or another excessively (e.g., reducing a person to something intrinsically bad) and reacting according to this alteration causes others to react negatively [16]. Thus, a two-way relationship is established between the person and his/her entourage, leading them to influence each other in their interactions and reactions.

Among the defense mechanisms that contribute to image distorting defensive style, those of interest for us are splitting (failure to reconcile positive and negative attributes, in a global understanding of a person or a situation, which leads to an all-or-nothing thought), projection (the person perceives their thoughts as coming from an external source), projective identification (parts of the self and internal objects are split off and projected into the external object, which then becomes possessed, controlled, and identified with the projected parts) [15, 17]. Unlike projection, the

latter does not refuse to recognize the impulse but falsely attributes it as being a justifiable reaction of the other [15]. The other defense mechanisms of interest help rejecting complaining (repetitive use of a complaint or a series of complaints in which the subject ostensibly asks for help and expresses the anger as an indirect reproach as not good enough, while continuing to ask for more of it) and reaction formation (replacing his/her initial impulse toward a situation or an idea by the opposite impulse) [15]. Splitting can alternate between devaluation (over-attributing negative attributes to self or others) and idealization (over-attributing positive attributes to oneself or others) [15]. In general, these immature defense mechanisms have the main function of protecting the self-esteem of the person who uses them unconsciously by using various forms of affect displacement and image distortion [15].

Previous research on aggression has demonstrated strong relationships between image distorting style and aggression [18–20]. Specifically, the results of a study investigating defense mechanisms and suicide (which can be considered a form of self-harm/auto-aggression) indicate a significant association between the use of this defensive style and the risk of committing a suicide attempt [18]. In the same vein, in a study carried out among groups of participants with a borderline personality disorder (a psychopathology known to make extensive use of image distorting style and for impulsive and aggressive behaviors [21]), who had either already committed suicide attempts or not, the splitting of the image of others was one of the factors significantly influencing suicide attempts [20]. In parallel, a previous study reported a robust association between image distorting style and the propensity to react aggressively to frustrating or provocative situations [19]. Taken together, these results suggest that using this defensive style may increase the propensity of an individual to react aggressively, either to themselves or to others. Thus, it is important to ask how seeing others or oneself as all good or all bad could lead to RA? How could projecting our negative internal states onto others lead to this type of behavior? The literature demonstrates there is a gap in our knowledge regarding the explanation of the link between image distorting style and RA, particularly in what context this association exists. It is plausible to think that the impulsive tendencies of individuals would be a potential factor in explaining this link, given the fact that overall impulsivity is found to be associated with RA [7].

Impulsivity is a predisposition to rapid and unplanned reactions to internal or external stimuli without consideration of the negative consequences of these reactions on the impulsive individual or on others [22]. In an attempt to conceptualize the impulsivity trait in Whiteside and Lynam [23], the authors extracted four factors that can make up this trait: 1) sensation seeking, 2) lack of perseverance, 3) lack of planning, and finally 4) urgency. The urgency trait, whether positive or negative, is similar to the impulsivity facet of neuroticism [24]. The negative urgency (NU) personality trait is defined as an individual's disposition to initiate reckless behaviors when the latter experiences negative affects [24]. In contrast, positive urgency is defined as the tendency to act recklessly when experiencing intense positive affective state. Nonetheless, NU has been reported to be the best predictor of severity of medical, drug, employment, family, social, alcohol, legal, and psychiatric problems in individuals with substance dependencies [25]. Indeed, NU predicts heavy alcohol consumption in highly depressed individuals and is correlated with heavy alcohol intoxication in individuals with high levels of anxiety [26, 27]. Moreover, among people who score high on the neuroticism trait, a significant alcohol problem was present only in those with a high NU score [28]. NU seems to explain a part of the tendency to act carelessly in times of distress. Cougle and Timpano [29] demonstrated that this component

of impulsivity is associated with obsessive behaviors. On the other hand, the latter emphasizes that this association is present only in times of great distress. It also appears that situations characterized by negative affect may increase impulsive behavior in individuals with a predisposition toward NU [30]. For instance, during experimental induction of social rejection, participants demonstrated greater behavioral impulsivity during an inhibition task [30]. Those results demonstrate that negative affect can lead to increased behavioral disinhibition and therefore, increased impulsivity, especially in people with a high NU trait.

Since NU is linked to reckless acts when experiencing intense negative affect [24], unlike the facet of positive urgency which is its equivalent when experiencing intense positive affect, it is plausible to suggest that this facet of impulsivity could have an important role to play through various more problematic behaviors in society, such as aggressive behaviors. Several studies have attempted to clarify the link between NU and aggressive behaviors [7, 31–34]. Miller and Flory [32] demonstrated with the Conflict Tactics Scale that aggression was predicted by NU. In addition, the NU trait could increase the risk of aggression in two ways: 1) it could increase the reactivity to situations that incite aggression and 2) it could act as a disinhibitor, thus making the aggressive response more conducive and accessible [24, 33]. In another study by Maneiro and Cutrín [7], the authors tested the distinctiveness of proactive and reactive aggression. They demonstrated that NU, the impulsive/irresponsible factor of psychopathy, and the lack of agreeableness were associated with RA, while proactive aggression was rather associated with personality traits characterized by a lack of honesty/humility and emotionality. In parallel, in a meta-analysis aimed at observing the link between the different facets of impulsivity and aggression, it was shown by Bresin [33] that each facet of impulsivity correlated weakly or moderately with different forms of aggression, but that the correlation with NU was significantly stronger than with the other facets of impulsivity. Moreover, as predicted by the author, the negative/positive urgency facet was significantly related to the variance of RA, unlike the other facets of impulsivity, suggesting that individuals with high urgency traits may be more conducive to adopting aggressive behaviors after provocation. This assumption is consistent with the conceptualization of urgency as a reactive form of impulsivity [33]. The results of this study echo those of other studies, such as the one by Gagnon and Rochat [34], which demonstrated that NU could act as a mediator between hostile attribution bias (the fact to attribute hostile intentions to others in an ambiguous social situation) and RA. According to the authors, two routes could explain this relationship. On one hand, the tendency to use the hostile attribution bias accompanied by the accentuation of negative affect could facilitate RA through the difficulties of controlling and managing negative affect. On the other hand, hostile attribution biases emanating from social provocation could enhance RA through the triggering of inappropriate beliefs, which could thereby reduce the control of hostile thoughts and behaviors [34]. To a better understanding of the links between aggression and personality, Miller and Zeichner [31] simultaneously analyzed different personality and impulsivity models in relation to different forms of aggression (i.e., proactive, reactive, and relational). The analyses demonstrated from a trait perspective, that the three forms of aggression correlated significantly together and provided similar trait profiles. However, by only taking into account the residual results of RA (RA regressed on proactive aggression and relational aggression), the authors realized the existence of a correlation between RA and traits that are linked to negative emotions such as NU [31]. Moreover, in a study by Derefinko and DeWall [35], NU was a consistent predictor of intimate partner violence perpetration and plays a unique role

in the prediction of aggression toward an intimate partner, but not necessarily with a nonintimate partner; suggesting distinct cognitive processes between general violence and intimate violence behavior that need to be clarified. Thus, considering that a reactive-aggressive individual tends to overreact to a minor provocation and considering that, impulsivity is a tendency to act on the spur of the moment, unplanned and without thinking, the symbiotic relationship between RA and impulsivity, or the NU facet, is therefore evident.

Few studies have highlighted the relationship between image distorting style (or its defense mechanisms) and NU, or even with impulsivity in general. Indeed, in a study with a group of patients with depression, the authors report that splitting and projection were significantly correlated with impulsivity [36]. In a study with non-clinical participants, the results of Gagnon et al. [37] were able to confirm that splitting and identity diffusion reveal a unique association with impulsivity, although this association seems to vary depending on the tool used to assess impulsivity, according to the authors. Note that splitting has an influence on the proper development of ego functions such as impulse control [38].

It should also be noted that from a psychodynamic point of view, in particular from the classic model of “drive,” the “Id” (concerned with the gratification of drives in pursuit of pleasure, Lehrman [39]), and the “superego” (concerned with the setting of limits or the permitting of liberties) have a primordial role in impulsiveness and in the complexity to be able to bear negative affects [38]. It is also important to emphasize that splitting has an influence on the normal development of ego functions (defensive part of the personality), for example, impulse control [38]. Moreover, despite the small number of studies that have investigated the relationship between image distorting style and NU, some studies raise indirect evidence indicating that these two variables are related. Indeed, it is plausible to propose that the “projection” defense mechanism resembles a dysfunctional belief such as hostile attribution bias. Based on this proposition, we could therefore expect the image distorting style to be associated with NU, given the results found in Gagnon and Rochat [34]. In the same vein, Gagnon et al. [40] proposed that dysfunctional social schemas (e.g., others are untrustworthy) that align with hostile attribution biases activate other schemas and cause the individual to feel compelled to perform an impulsive action in order to defend against the suffering resulting from an attack on his/her self-esteem.

Indeed, the image distorting style includes several defense mechanisms, some of which are related to the inhibition of dominant responses, for instance, *omnipotence* [19], a defense in which the subject reacts to emotional conflict or internal and external stressors by acting in a superior way to others as if this individual possesses special powers or abilities [15]. In parallel, NU was associated with inhibition of the dominant response [41]. Additionally, NU has been shown to mediate the association between hostile intent attribution biases (akin to projection) and impulsive behaviors (including aggression) [40]. Indeed, this relationship can be explained in terms of a belief that drives an individual to act impulsively. Thus, the relationship between image distorting style and NU remains to be clarified, namely whether it involves processes of inhibition on the dominant response or not. Does it increase affect beyond the ability to control action? Does it set up beliefs that encourage the person to become impulsive? In studies conducted with subjects diagnosed with borderline personality disorder, strong correlations have been found between image distorting style and various measures of impulsivity [42] and between primitive defense mechanisms (for example paranoid projection and splitting) and impulsivity [43]. In addition, one study demonstrated a relationship between borderline personality disorder

and the trait of urgency impulsivity [44]. In a prior study of a sample of different groups of obese women, researchers looked at differences in splitting, impulsivity, and difficulty in romantic relationships [45]. The group of obese women seeking bariatric treatment had significantly higher levels of splitting and impulsivity compared to the group of obese women who were not seeking this treatment, but lower levels compared to the obese group with bulimia nervosa (a disorder characterized by binge eating and consequent compensatory behaviors, excessive concerns about body shape and weight [46]) were obtained [45]. Furthermore, the results of Puhalla and McCloskey [47] demonstrated that participants with intermittent explosive disorder (a psychopathology known to exhibit impulsivity) had higher scores of immature defensive styles compared to a group of participants with personality disorders and a control group.

Overall, it appears clear that the relationship between image distorting defense mechanisms and impulsivity has generally been examined more in clinical than nonclinical participants. It is also obvious that there is a gap in the literature when it comes to explaining the complexity of the relationship between image distorting style and NU. Thus, it is of primary interest to perform analyses to examine the role of NU in the putative association that links image distorting style to RA.

Analyses that allow to understand the nature of the relationship between two variables are the moderation and mediation analysis. Moderation analyses aim to better understand if the strength or the sign of an effect of an independent variable on a dependent variable interacts with a moderator variable or variables [48]. Thus, moderation analyses describe when the variables are related to each other [49, 50] and also under what context or conditions relationships between variables occur [49]. A moderator can be defined as a qualitative or quantitative variable that influences the direction and/or the strength of the relationship between an independent or predictive variable and a dependent variable or a criterion [50]. When there are moderating effects, this indicates that the modeled function changes according to the different levels of the moderator, where the moderators can consist either of factors manipulated in an experimental context or of natural variables [51]. In the case of mediation analyses, these aim to understand the causal chains responsible for the effect of an independent variable on a dependent variable [48]. A mediator is defined as a variable that is located in a causal chain between two variables [51] and describes why and how the variables influence each other [49, 50].

From a theoretical point of view and according to the results of the studies found in the literature, it is logical to propose that NU could hold a role of moderator, and not of mediator in the relationship between image distorting style and RA. More specifically, it makes sense to postulate that the more an individual uses a defensive style that distorts the image of oneself or others, the more aggressively this individual will react to frustrating or provocative situations, and this relationship will be strengthened or weakened depending on whether the individual is considered capable of controlling their actions in an intense emotional context. The existing literature does not indicate if using image distorting style should lead them to become more impulsive and consequently react more aggressively in the presence of frustrating or provocative situations. This relationship remains unclear but is still possible. Thus, a moderation model can be proposed, in particular, that the link between the image distorting style and RA is moderated by the different levels of NU impulsivity trait. In the same vein, a second model of partial mediation (i.e., other mediating variables can explain the relationship between our independent and dependent variable) can

be proposed in order to demonstrate the absence of a mediating role of NU in the relationship between image distorting style and RA.

Overall, the previous data on defense mechanisms, impulsivity, and aggression raises several questions about the nature of the relationship between the distortion of the image of oneself or others and RA. For instance, what happens when an individual feeling negative emotion, with high or low levels of NU, uses defensive style that distorts the image of oneself or others? Does this individual react more aggressively to frustrating situations? Alas, there seems to be a gap in our understanding of the influence of NU in the relationship between distorting the image of self or others and reacting aggressively to frustrating or provocative situations. To our knowledge, no study to date has attempted to investigate the moderating role of NU on the relationship between image distorting style and RA or to refute its mediating role in this relationship.

The objective of the present study is to explain the nature of the relationship between image distorting style and reactive aggression, more specifically to demonstrate whether, in non-clinical participants, the relationship between image distorting defensive style and reactive aggression is moderated, not mediated by the negative urgency impulsivity trait. In agreement with the literature about the link between image distorting style and RA [19], we hypothesize that the relationship between image distorting style and RA will be moderated by NU, but will not be mediated by the latter. More specifically, we expect the relationship between these two variables of interest to be strengthened when the level of NU increases. A moderation model and a partial mediation model of NU will be tested between the image distorting style and RA.

2. Methodology

2.1 Participants

Our sample consisted of 32 participants (10 men and 22 women), (mean age = 30.0 years, SD = 9.0; mean education = 16.0 years, SD = 3.7) taken from a larger sample from a previous study [52], which included online questionnaires and experimental tasks in the laboratory. Participants were recruited from a university campus and the general population from advertisements placed in newspapers, on the internet, and in the local community. All participants underwent an initial screening telephone interview that included a brief description of the study, followed by a series of questions assessing sociodemographic information and study inclusion and exclusion criteria (see below). Potential participants were informed that the study consisted of two test sessions ranging from 60 to 90 minutes, or 3 hours in total. The inclusion criteria were to be between 18 and 55 years old, to be able to speak and read French, and to have normal or corrected vision. The exclusion criteria were to have a level of education lower than a sixth grade of primary school, to report having already had a head injury, and to have a history of psychosis. Prior to the lab visit, participants were required to complete the online questionnaires (DSQ-60, RPAQ, and UPPS; see below) that are part of this study. Thereafter, participants were invited to the lab to take part of another study and asked to abstain from alcohol and recreational drug use for at least 12 hours before each session. All participants gave written informed consent and obtained \$40 (CAD) at the end of their participation.

2.2 Assessments and measures

2.2.1 *Defensive style questionnaire (DSQ-60)*

The DSQ-60 version is a self-reported questionnaire of 60 items which, based on the DSM-IV, makes it possible to measure the explicit derivatives of 30 defense mechanisms (i.e., two items per defense mechanism) [53]. Items are rated on a 9-point Likert-type scale ranging from 1 (“not at all applicable to me”) to 9 (“completely applicable to me”) and participants were asked how much each of the 60 items apply to them. This questionnaire makes it possible to evaluate three distinct defensive styles: “image distorting,” “affect regulating,” and “adaptive.” The scores for each defensive style are estimated by taking the average of the two items corresponding to each defense mechanism and then adding it to the total mean score for each defensive style. The three defensive styles were determined through exploratory and confirmatory factor analyses by Thygesen and Drapeau [53] from a sample of anglophone and francophone university students. Internal consistency for the defensive style “image distorting” was described as moderate (0.64) [54]. In the present study, we obtained an adequate internal coherence coefficient for image distorting style ($\alpha = 0.738$).

2.2.2 *UPPS impulsivity behavior scale*

The validated and translated version in French of the UPPS-P [55] was used to measure the negative urgency impulsivity trait. The UPPS-P is a 20-item self-report scale that assesses five aspects of impulsivity: positive urgency (e.g., “When overjoyed, I feel like I cannot stop myself from going overboard), negative urgency (e.g., When I feel rejected, I will often say things that I later regret), lack of perseverance (e.g., I am a person who always gets the job done), lack of premeditation (e.g., I usually make up my mind through careful reasoning), and sensation seeking (e.g., I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional). Items are rated on a 4-point scale ranging from 1 (= I agree strongly) to 4 (= I disagree strongly). Higher scores indicate higher level of impulsivity (note that all items of positive urgency, negative urgency and sensation seeking are reversed). The scores of that scale have good results in terms of internal consistency, test-retest stability, and predictive validity [55]. In the present study, the internal consistency for the subscale “negative urgency” demonstrate excellent reliability ($\alpha = 0.938$). Only the “negative urgency” subscale was used for the analyses in this study.

2.2.3 *Reactive-proactive aggression questionnaire (RPAQ)*

As part of this study, the RPAQ [5] translated into French and developed by Gagnon and Rochat [34] has been used. The RPQ contains 23 self-reported items rating reactions to aggressive situations on a 3-point Likert scale ranging from never to always (0–2). The Reactive Aggression Subscale (e.g., “How often have you reacted angrily when provoked by others”) contains 11 elements and the 12 proactive elements (e.g., “How often have you threatened and bullied someone”). Higher scores indicate a greater level of aggression. The reliability and validity of the scales have been demonstrated in samples of adolescents, undergraduates, and adults [5]. Only reactive aggression was considered for the purposes of our analyses in this study. In the present study, this subscale has a good reliability with a Cronbach’s α of 0.077.

2.3 Statistical analysis

All statistical analyses were performed with Rstudio team (2021). First, we took care to perform preliminary analyses to verify certain factors and ensure that the assumptions of multivariate normality were respected. Second, descriptive analyses were carried out in order to obtain a detailed overview of our sample at the level of gender, age, and education. Third, a moderation analysis was performed to test the hypothesis that the impulsivity trait NU moderates the association between image distorting style and RA. Fourth, a partial mediation analysis was performed to test the hypothesis that the association between image distorting style and RA is not mediated by NU. The direct and indirect link between image distorting and RA have therefore been modeled. A coefficient product test for mediation analyses was performed using bootstrapping procedures, a robust nonparametric resampling technique for testing indirect effects [56, 57]. It is recommended to use this resampling technique instead of the widely used Sobel test with the recommended option of Baron and Kenny [50], which is a standard hypothesis test [58]. Bootstrapping allows us to give less weight to scores that are rarer in our sample in order to ensure that our probabilities are not too affected by sampling errors. A mediating effect is assumed when the bias-corrected 95% confidence intervals (CIs) do not contain the value zero [48]. Estimates were based on 5000 bias-corrected bootstrap samples.

3. Results

3.1 Preliminary analysis

The presence of important independent variables, sample size, missing data, range, extreme scores, independence of scores, normality of variables, linearity, multicollinearity, normality of residuals, and homogeneity of the variance of the residuals (homoscedasticity) was examined. Multivariate extreme scores were checked by examining the Mahalanobis distance. All of these factors and assumptions were respected.

3.2 Moderation analysis

To avoid potential multicollinearity issues, all continuous independent variables were centered. Next, we multiplied together the independent variable image distorting style with the moderator NU to create the interaction term. Model 1, without the interaction term, was significant $F(2, 29) = 28.961, p < 0.001$. Model 2, with the interaction term, was also significant $F(3, 28) = 18.750, p < 0.001$. However, model 2 with the interaction term between image distorting style and NU did not account for significantly more variance than model 1. The R squared of our interaction term was found to be insignificant $\Delta R^2 = 0.001, p = 0.744$, indicating that there is no interaction. These results do not support the hypothesis that the association between image distorting style and RA is potentially moderated by the different levels of NU.

3.3 Partial mediation analysis

A proposed partial mediation model was tested to verify the hypothesis that the association between image distorting style and RA is not mediated by NU. The determinant

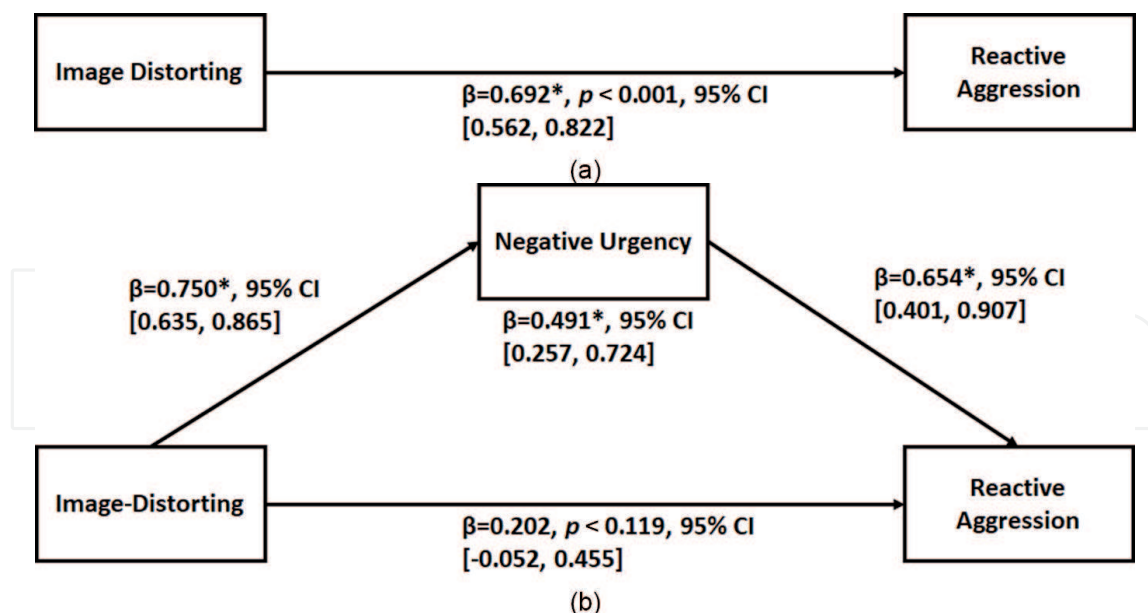


Figure 1.
a. Total effect of the image distorting-reactive aggression relationship. The beta shown in this figure is standardized. b. Mediation of the image distorting-reactive aggression relationship through negative urgency. The betas shown in this figure are all standardized.

of the correlation matrix is 0.145, which is greater than 0.0001 and suggests an absence of multicollinearity. Looking at the model (see **Figure 1a**), the results indicated that the total effect was significant ($\beta = 0.692, p < 0.001, (95\% \text{ CI } [0.562, 0.822])$). By observing the model with the inclusion of the NU variable as a mediating variable (see **Figure 1b**), the results demonstrated that the direct link between image distorting style and RA turned out to be nonsignificant ($\beta = 0.202, p = 0.119, (95\% \text{ CI } [-0.052, 0.455])$). The results also indicated a significant direct relationship between image distorting style and NU ($\beta = 0.750, p < 0.001, (95\% \text{ CI } [0.635, 0.865])$). In addition, a direct link between NU and RA was found ($\beta = 0.654, p = p < 0.001, (95\% \text{ CI } [0.401, 0.907])$). The results indicated a significant indirect relationship between image distorting style and RA via NU ($\beta = 0.491 (95\% \text{ CI } [0.257, 0.724]), p = 0.001$). The results suggest that NU fully mediates the association between image distorting style and RA.

An effect size of 0.563 was obtained for NU and 0.666 for RA, which is considered large effects according to [59]. This indicated that 56.3% of the average NU variance is explained by the variables in our model, while 66.6% of the variance in RA is explained by other variables in our model.

We tested the proposed partial mediation model by adding the variables age and education as covariates. None of our covariates was found to be significantly related to RA. The results obtained by performing a mediation test with the addition of one of the covariates are not essentially different from those obtained without the addition of the covariates.

4. Discussion

The objective of this study was to explain the nature of the relationship between image distorting style and reactive aggression, more specifically to demonstrate whether, in nonclinical participants, the relationship between image distorting defensive style and reactive aggression is moderated, not mediated by the negative

urgency impulsivity trait. Contrary to the hypothesis that was proposed, the results of the moderation analysis were not able to demonstrate that NU acts as a moderator in the relationship between image distorting style and RA.

Results obtained from the proposed partial mediation model are the significant indirect link and the non-significant direct link between image distorting style and RA (see **Figure 1b**), even after controlling for age and number of years of education. This suggests that NU mediates not partially but fully the relationship between image distorting style and RA. Thus, the more a person distorts the image of oneself or others, the more he/she acts impulsively with NU, and the more he/she will react aggressively in response to provocations or frustration. This is in accordance with the results of Gagnon and Rochat [34], demonstrating a similar mediation role with hostile attribution biases, instead of image distorting style. This makes sense when considering HAB as a distortion of reality, since it arises from a person's subjective interpretation of it, based on a given context and can be a distorted, or misinterpreted reflection of reality. In Gagnon et al. [19], a significant correlation has been found between the event-related N400 in a nonhostile condition and image distorting style, namely between hostile intent attribution and image distorting style. It is plausible that hostile intent attribution/hostile attribution biases are conceptually closely related to image distorting style, given the projective components of hostility. Consequently, it is possible to believe that the mediation role of NU obtained in the actual paper is an extension of the one found between hostile attribution biases and RA. The direct link between image distorting and NU was found significant, which suggests that the more an individual makes use of a defense mechanism distorting the image of oneself or others, the more this individual will have a disposition to have reckless behaviors during negative affective state, which is consistent with studies that have found indirect results on this relationship [19, 40, 41]. The direct link between NU and RA was found to be significant, supporting findings found in the literature, suggesting that the more individuals have a disposition to initiate reckless behaviors when resenting negative affective state, the more aggressively they will react to provocation [7, 31–34].

The total effect was found to be significant, suggesting that image distorting has a positive influence on RA when not controlling for the relationship between the mediator NU and RA, which is in agreement with the results of Gagnon et al. [19]. A surprising result is the complete mediating role of NU in the relationship between image distorting style and RA (given the lack of knowledge in the literature on the mediating role of NU in this relationship). We believe that other variables may have a role in the proposed causal chain, for instance, other types of impulsivity such as state impulsivity [60]. Taken together, our results suggest that when individuals put themselves in a defensive state leading to distorted images of self and others, they become more emotionally impulsive, leading to RA. In other words, the use of defense mechanisms associated with image distorting style could be the starting point in triggering RA when NU mediates this relationship. Without NU, the individual could simply distort their reality, but when NU is involved, RA is more likely to translate at the behavioral level. This is plausible on a theoretical level, given the significant mediator effect of NU in the relationship between image distorting style and RA is conceptually close to the one found between hostile attribution biases and RA [34], hostile attribution biases being conceived, such as a kind of projection defense mechanism or a defense distorting the image of others. Globally, two paths may elucidate the relationship between image distorting style and NU in the endorsement of RA behaviors. The first possible path might be that the tendency to make use of image distorting style increases negative effect, which in turn increases the difficulty to

control negative effect, and ultimately facilitates RA behaviors. A second path might be that image distorting style may activate dysfunctional beliefs (e.g., categorizing someone as bad), which may reduce the capacity of an individual to control his/her perception of other individuals, then facilitating the enactment of RA behaviors via an oversimplified and subjective perception [40].

Our study has several limitations that should be taken into consideration. It is paramount to consider that longitudinal designs are greatly preferable for testing if an effect is stable across time and if there is a proof of temporal precedence [51]. The actual study used a cross-sectional design, so we must therefore interpret our results with caution because the cross-sectional design does not allow us to really evaluate the proposed causal chain. Thus, we recommend for future studies to develop a protocol with a longitudinal design. Another limitation to consider is the small sample of the actual study, which might have restrained sufficient statistical power for examining particular hypotheses. The data used for our analyses are secondary, so it is not possible to make causal inferences from our obtained statistical results. We, therefore, recommend setting up a protocol with the specific aim of verifying the hypotheses proposed in this study. We also recommend using tools other than self-report questionnaires, as participants may demonstrate social desirability when completing this questionnaire or may simply be unaware of the defense mechanisms they are using. Qualitative interviews and projective tests would make it possible to evaluate the use of defense mechanisms of image distorting style of the participant from another perspective (for instance the Thematic Apperception Test or the Rorschach Inkblot Test).

5. Conclusion

The present study investigated the role of NU in the relationship between image distorting style and RA. Taken together, the results obtained in this preliminary study suggest that NU plays a crucial role in the relationship between image distorting style and RA and possesses important theoretical and clinical implications for enabling clinicians to better intervene at the source of aggressive behaviors, which according to our results, could be found as much in dysfunctional beliefs or the use of defense mechanisms with the function of distorting reality (the use of image distorting defense mechanisms being known to harm the therapeutic alliance [61]) as in certain facets of impulsivity such as NU. Our results may provide a better explanation of the internal factors that could increase RA and an opportunity to prevent aggressive behaviors based on this finding. Thus, the results of the present study make it possible to better understand the complexity of the link, which unites the image distorting style and RA.

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JG conceptualized the study and provided the data. PM, DR, and JG analyzed and interpreted the data and contributed to the writing of the manuscript. All authors have approved the submitted version of this manuscript.

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