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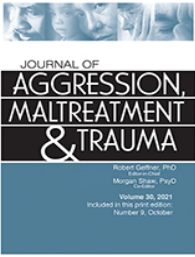
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Physical, Verbal, and Relational Aggression: The Role of Anger Management Strategies

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ABSTRACT

Identifying adaptive and maladaptive anger management strategies is an important component in violence prevention programs. However, little attention has been paid to examining their influence in minimizing physical, verbal, and romantic relational aggression. This study examined the association between anger, anger management strategies, and different forms of aggression, specifically general physical and verbal aggression toward others and romantic relational aggression. Participants ($N = 237$; 39.4% males), aged between 19 and 78 years ($M = 33.74$, $SD = 12.92$), were assessed using self-reports. Results indicated that elevated levels of anger were a risk factor for displaying physical, verbal, and romantic relational aggression but anger management strategies only had an impact on romantic relational aggression, not physical or verbal aggression. Prevention and intervention programs should first identify the form of aggression displayed and tailor the intervention based on the anger management strategies that are effective. For romantic relational aggression-specific anger management strategies (escalating and negative attribution) should be targeted.

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According to Berkowitz's Cognitive-Neoassociationistic theory (Berkowitz, 1990), a primitive form of anger is automatically triggered upon a provocation through an associative network of components including feelings, thoughts, memories, and most emphasized, physiological, and expressive motor reactions. Anger (the emotion) as a precipitant of aggression (the behavior) has been supported by empirical evidence (Crane & Testa, 2014). Research in this area has identified different forms of aggression including physical; harming others using physical force (Norlander & Eckhardt, 2005), verbal; threatening others using words (e.g., Bodenmann et al., 2010; Chen et al., 2012), and relational; damaging social relationships using manipulation (Crick & Grotpeter, 1995). It is evident that these types of aggression are increasingly prevalent (Derrick et al., 2014; Zimmer-Gembeck et al., 2018), equally

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contribute to intimate partner violence (Wright & Benson, 2010), and have negative consequences on people's emotional and social life (Chen et al., 2012) as individuals with these problems can be interpersonally challenging.

Treatment efforts for regulating anger or aggressive behavior has been widely available in addressing anger-aggression related problems and behaviors toward others and intimate partners (Lee & DiGiuseppe, 2018; Stith & Hamby, 2002). Anger regulation comprises of conscious or automatic processes that modulate the experience of anger (Gilam & Hendler, Gilam and Hendler, 2015), thus offering a promising point of intervention in interpersonal relationships. Anger management classes in some countries are offered as a condition upon the individuals release or probation, therefore extending our knowledge about the effectiveness of these strategies which are used in these anger management programs is needed. Considering that anger management efforts have provided promising results (Howells et al., 2005; Lee & DiGiuseppe, 2018), the present study sought to extend the scientific literature by examining the anger-aggression relationship in the different types of aggression (e.g., physical and verbal aggression as well as relational aggression in intimate relationships).

Aggression

Aggression is defined as an act performed with an intention to harm other people (Anderson & Bushman, 2002). The most common form of aggressive behavior reported is physical aggression; which includes behaviors enacted to harm others physically (e.g., hitting, biting, and kicking) that is distinguished from verbal aggression; which includes actions to hurt another with spoken words (e.g., screaming and name calling) (Warburton & Anderson, 2015). Verbal aggression is often conceptualized under "psychological" aggression; an aggression intended to hurt others' feelings and cause psychological pain (Bodenmann et al., 2010; Murphy & Hoover, 1999). Another form of aggression; relational aggression has shown to be distinctive of overt aggression (e.g., open confrontational acts like physically harming others) as the goal of this aggressive action is to manipulate and damage others relationships (Crick & Grotpeter, 1995; Ersan, 2019). Although numerous studies (e.g., Ersan, 2019; Kokkinos & Voulgaridou, 2017) have identified relational aggression in children and adolescents within the context of peer relationships, romantic relational aggression in adult populations should be explored as previous work suggests that this nonphysical form of aggression contributes to serious relationship problems, such as violence toward intimate partners (e.g., Wright & Benson, 2010). An example of relational aggression in the romantic context involves flirting to induce a partner's jealousy, giving them the silent treatment when feeling angry and using threats as a method to ask for a partner's compliance (Linder et al., 2002; Morón & Mandal, 2021).

It is evident that these various forms of aggression have similar underlying factors that are associated with the prevalence of aggressive behavior such as anger (the emotion) and hostile attribution bias (Thomas & Weston, 2020). Attributional bias influences the way people assess a situation or other people intentions, and can lead to aggressive behaviors that are displayed toward strangers but also toward intimate partners (DeWall et al., 2011). Previous studies (e.g., Kokkinos et al., 2017; Thomas & Weston, 2020) have shown that social information processing is significantly related to relational aggression. More specifically, hostile attributional bias partially mediated the relationship between both proactive and reactive relational aggression (Kokkinos et al., 2017), suggesting that people who aggress relationally tend to attribute ambiguous information negatively in response to relational conflict. In romantic relationships, bias in attribution is suggested to have a positive association with dating aggression (Calvete et al., 2014).

Different types of aggression whether physical, verbal, or relational, affect relationship quality and contribute to mental health issues (Derrick et al., 2014; Hayes et al., 2021; Lento-Zwolinski, 2007). People who reported high levels of physical aggression, for example, experienced more relationship problems (Hayes et al., 2021) and reported lack of satisfaction with their relationships (Barros-Gomes et al., 2019). In addition, verbal forms of aggression were positively correlated to high stress levels (Bodenmann et al., 2010) and depression (Barros-Gomes et al., 2019; Yavuzer et al., 2019). Likewise, relational aggression has been associated with higher levels of depression and loneliness (Blain-Arcaro & Vaillancourt, 2017; Crick & Grotpeter, 1995), social adjustment problems (Lento-Zwolinski, 2007) and rated their romantic relationships as “poor” (Linder et al., 2002). Given the negative effects of these different forms of aggression on mental health, it is essential to examine the different forms (physical, verbal, and relational aggression) to aid our understanding of adults’ aggression, their similarities and differences, and how to best prevent them.

Anger and anger management

The current theory of cognitive neo-association posits that aggression is a result of associative networks of an emotional state and consists of specific feelings, thoughts, physical arousal, evoked by frustrating events (Berkowitz, 2012). Anger, specifically, is a fundamental emotion that plays a significant function in maintaining aggressive intention, increasing physiological arousal, and more importantly anger-related knowledge is used to interpret situations and provide aggressive responses (Anderson & Bushman, 2002). When the emotion of anger is produced, anger-related scripts, schemas, and motor impulses are automatically activated, leading to an inclination of aggressive behavior (Berkowitz, 2012). Although anger has an adaptive function to

respond toward threat and eliminate the source of harm from the environment (Lochman et al., 2010), chronic anger as a negative emotion is a source of strain in close relationships (Von Salisch & Vogelgesang, 2005). Loved ones, including family members, close friends, and intimate partners are more frequently the recipients of the expression of anger (Hayes et al., 2021; Slep et al., Slep, et al., 2021) because of the immediate access and close contact (Von Salisch & Vogelgesang, 2005). Anger is distinct from other aversive emotions (e.g., sadness and fear) as expressing anger is specifically associated with social maladjustment, lower quality in relationships (MacKenzie et al., 2014), and aggressive behaviors (Dahlen et al., 2013; Dye & Eckhardt, 2000; Murray-Close et al., 2010).

The majority of aggression interventions use anger management skills to prevent the escalation of anger (the emotion) and aggression (the behavior) and aim to reduce the violence (DiGiuseppe & Tafrate, 2003; Howells et al., 2005; Novaco & Taylor, 2015). Anger management skills often comprised of cognitive (e.g., recognizing signs of anger) and behavioral strategies (e.g., relaxation strategies; taking time out to better control anger) (Lee & DiGiuseppe, 2018). The application of adaptive anger management skills (e.g., self-awareness) were found to be associated with lower reports of physical aggression in romantic relationship (Stith & Hamby, 2002). Another anger management strategy that helps deescalate anger is taking “time out,” as it allows the person to calm down and has been found effective in reducing anger and partner abuse (Wong & Bouchard, 2020). Maladaptive anger management strategies (e.g., escalating anger and negative attribution bias), however, were found to contribute to the maintenance of aggression (Stith & Hamby, 2002). For example, Shorey et al. (2014) found that women’s negative attribution and escalating strategies were positively associated with physical and psychological aggression in relationships when assessing dating violence (Shorey et al., 2014). Additionally, hostile attribution bias has been associated to reactive and proactive relational aggression (Kokkinos et al., 2017).

While all of these studies have strengthened the assumption that maladaptive anger management strategies contribute to aggression, anger management efforts that aim to inhibit anger and eliminate violence favor more evidence, as they are not always effective (Short, 2016). Howells et al. (2005) identified that anger management programs yielded small effects for reducing aggression in violent offenders compared to a group who did not receive anger management treatment. In a more recent study (Short, 2016), the effectiveness of anger management programs comprising of psychoeducation and cognitive behavioral components was questioned because the anger management intervention did not fully address the intense and prolonged emotional arousal. In situations of intense and prolonged anger, cognition is governed by emotion, allowing only thoughts that confirm, justify or feed the emotion to prevail,

skewing the processing of information. Given the issues discussed above, the present study aims to examine different anger management strategies used and how they relate to various forms of aggression.

Current study

The main goal of this study is to investigate the relationship between anger (the emotion), anger management strategies, and three different forms of aggression. Physical and verbal aggression will be examined in this study in a more general sense, assessing aggression directed to unspecified people (e.g., strangers) while relational aggression is a form of aggression specifically aimed at intimate partners. The current study is distinct in several ways from the prior research on anger and aggression. First, this study examines different forms of aggression and as such, the findings can inform future prevention and intervention programs for adults focusing on addressing these forms of aggression. Second, by examining the three forms of aggression, the current study aims to assess the similarities and differences related to these types of aggression, and thus extend and inform other studies that have differentiated physical, verbal, and relational aggression (e.g., Buss & Perry, 1992; Crick & Grotpeter, 1995; Warburton & Anderson, 2015). Third, the current study is to our knowledge the first to examine anger management strategies that consider both general physical and verbal aggression as well as romantic relational aggression. More specifically, we hypothesized that: (1) Participants reporting high levels of anger will report greater levels of physical, verbal, and relational aggression, and (2) Participants using adaptive anger management strategies (e.g., self-awareness and calming strategies) will report lower levels of physical, verbal, and relational aggression. In contrast, participants reporting more maladaptive anger management strategies (e.g., escalating strategies and negative attribution) are expected to report higher levels of physically, verbally, and relationally aggressive behavior.

Method

Participants

A total of 307 participants took part in this study. Ten participants (4%) were excluded from the study due to missing data. The final sample consisted of 297 participants, aged between 19 and 78 years ($M = 33.74$, $SD = 12.92$). Of the total sample, 180 were females (60.6%) and 117 were males (39.4%). At the time the study was conducted 38.7% ($n = 115$) of participants were married, .7% ($n = 2$) were engaged, and 19.5% ($n = 58$) were in a relationship. Additionally, 38.4% ($n = 114$) were single, 1.7% ($n = 5$) were divorced, .7% ($n = 2$) were separated, and .3% ($n = 1$) were widowed.

Measures

Demographic questionnaire

Participants were asked to provide their gender, age, and relationship status.

Buss-Perry aggression questionnaire (BPAQ; Buss & Perry, 1992)

The BPAQ consists of 29 items and has four aggression subscales: physical aggression, verbal aggression, anger, and hostility (Buss & Perry, 1992). Items are rated on 5-point Likert scale (e.g., 1 = *extremely uncharacteristic of me* to 5 = *extreme characteristic of me*). The present study only included the anger subscale (seven items), the physical aggression subscale (nine items), and verbal aggression (five items). Anger is conceptualized as an emotional aspect of aggressive behavior which is comprised of physiological activation (e.g., “when frustrated I let my irritation show”). Physical and verbal aggression, in contrast, measure behavioral aspects of aggression (e.g., “once in a while I can’t control the urge to strike another person,” “when people annoy me, I may tell them what I think of them”). The BPAQ is widely used to measure aggression in various contexts involving intimate partner aggression (e.g., Crane & Testa, 2014; Thornton et al., 2016). The BPAQ has good construct validity (e.g., Reyna et al., 2011) and good reliability with Cronbach’s alpha ranging from .72 to .89 (Buss & Perry, 1992). The subscale of anger, physical, and verbal aggression in the current study showed high internal consistency (Cronbach’s alphas were .77, .76, and .73 respectively).

Self-report of aggression and social behavior measure (SRASBM; Morales & Crick, 1998)

The SRASBM is a 56-item self-report rated on 7-point Likert-scale (1 = *not at all true* to 7 = *very true*) and is used to assess relational aggression in intimate relationships (Morales & Crick, 1998). Only the five items measuring romantic relational aggression were used in the current study (e.g., “I have threatened to break up with my romantic partner in order to get him/her to do what I wanted”; Linder et al., 2002). A higher score on this subscale indicates that the participant displayed higher levels of relational aggression toward their partner. Participants who were not currently in a relationship were instructed to think about their prior intimate relationships. The SRASBM has good reliability and validity (Murray-Close et al., 2010). The Romantic relational aggression subscale in the present study demonstrated good reliability ($\alpha = .70$) which was comparable to a previous study (Linder et al., 2002).

Anger management scale (AMS; Stith & Hamby, 2002)

The AMS consists of four sub-factors comprising of cognitive and behavioral aspects of anger management. There are two adaptive anger management strategies; calming strategies (five items; the use of ‘calm down’ strategies in

response to anger; e.g., “I take time out as a way to control my anger at my partner”) and self-awareness (five items; represents participants’ level of awareness of physical changes in rising anger; e.g., “I recognize when I am beginning to get angry at my partner”) that are associated with reducing aggression. In contrast, negative attribution (five items; indicates negative cognitions and intentions attributed toward partner; e.g., “my partner likes to make me mad”) and escalating strategies (five items; represents strategies used to show rise in level of anger; e.g., “when arguing with my partner, I often raise my voice”) contribute to the increase in aggression. Items are rated on a 4-point Likert scale (1 = *strongly disagree*; 4 = *strongly agree*). AMS has good construct validity (Shorey et al., 2014), good reliability as shown by Cronbach’s alpha coefficient, ranging from .61 to .77 (Stith & Hamby, 2002). The internal reliability of each of the subscales in the current study were as follows: negative attribution ($\alpha = .83$), escalating strategies ($\alpha = .77$), calming strategies ($\alpha = .70$) and self-awareness ($\alpha = .62$).

Procedure

The study was granted approval by the Research Ethics Committee at the University of Edinburgh. Participants were recruited online through a link shared on various social media platforms (e.g., Facebook and WhatsApp) and offline (e.g., by posting posters in different areas in the city of Edinburgh). The survey was uploaded on Bristol Online Survey (a secure online platform). Participants were administered the questionnaires assessing anger, anger management strategies, and different forms of aggression, in the same order. Participants first read the information sheet, outlining the purpose of the study and had to provide consent before proceeding to the survey. Participation was voluntary. No compensation was provided. After completing the survey participants were directed to a debriefing page, thanking them for their participation.

Results

Descriptive statistics and correlation analysis among variables of interests were assessed using IBM SPSS Statistic version 24.0 (see Table 1). The strength of the correlation was determined according to Cohen’s (1992) coefficient, with $r = .1$ indicates a small effect, $r = .3$ shows a medium effect, and $r = .5$ is a large effect size. The correlation analysis suggested that anger was positively associated with physical, verbal and romantic relational aggression subscales, indicating that participants reported higher levels of anger tended to have higher scores on their self-reported aggressive behaviors. More frequent use of escalating strategies and negative attribution were significantly positively correlated to higher scores on the aggression subtypes (see Table 1). Self-awareness strategies showed non-significant correlations with all three types of

Table 1. Descriptive statistics and correlations for the main study variables.

Variables	Mean (SD)	1	2	3	4	5	6	7	8	9
1. Age	33.90 (13.07)	-								
2. BPAQ Physical Aggression	18.62 (6.26)		-.18**							
3. BPAQ Verbal Aggression	13.66 (3.93)			-.17**						
4. SRASBM Romantic Relational Aggression	11.24 (5.44)			.46**	-.14*					
5. BPAQ Anger	16.42 (5.24)				.31**					
6. AMS Escalating	12.25 (3.58)									
7. AMS Negative Attribution	7.75 (3.19)									
8. AMS Self-Awareness	14.72 (2.81)									
9. AMS Calming	14.07 (3.18)									

BPAQ = Buss-Perry Aggression Questionnaire (Buss & Perry, 1992); AMS = Anger Management Scale (Stith & Hamby, 2002); SRASBM = Self-Report of Aggression and Behavior Measures (Morales & Crick, 1998).

* $p < .05$, ** $p < .01$.

Table 2. Hierarchical linear regression for the physical, verbal, and romantic relational aggression.

	Model 1		Model 2		Model 3		Model 4	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Physical Aggression								
Age	-.14*	.03*	-.13*	.38**	-.12*	.01*	-.12*	.00
Gender ^a	-.03		-.08		-.10*		-.10*	
Relationship Status ^b	-.06		.01		-.00		-.00	
BPAQ Anger			.62**		.55**		.54**	
AMS Escalating					.10		.11	
AMS Negative Attribution					.07		.08	
AMS Self-awareness							-.05	
AMS Calming							-.01	
Verbal Aggression								
Age	-.07	.05*	-.06	.38**	-.07	.00	-.06	.00
Gender ^a	-.11		-.16**		-.17**		-.16*	
Relationship Status ^b	-.15*		-.08		-.08		-.08	
BPAQ Anger			.62**		.65**		.66**	
AMS Escalating					-.01		-.01	
AMS Negative Attribution					-.06		-.06	
AMS Self-awareness							.09	
AMS Calming							-.03	
Romantic Relational Aggression								
Age	-.13	.04*	-.13*	.17**	-.10*	.10**	-.14*	.03*
Gender ^a	-.03		-.06		-.08		-.09	
Relationship Status ^b	-.09		-.05		-.06		-.05	
BPAQ Anger			.42**		.24**		.26**	
AMS Escalating					.19*		.15*	
AMS Negative Attribution					.27**		.24**	
AMS Self-awareness							-.01	
AMS Calming							.18*	

^aGender coded: 1 = Male, 2 = Female; ^bRelationship status coded: 1 = Single, 2 = In a relationship, 3 = Engaged, 4 = Married.

BPAQ = Buss-Perry Aggression Questionnaire (Buss & Perry, 1992); AMS = Anger Management Scale (Stith & Hamby, 2002);

* $p < .05$, ** $p < .001$.

aggressive behaviors. Surprisingly, calming strategies showed a significant positive association with only romantic relational aggression. No significant correlations were found for the use of calming strategies and physical and verbal aggression.

Next, hierarchical linear regression analyses were conducted to test whether anger and anger management strategies predicted physical, verbal, and romantic relational aggression. Preliminary analyses were also performed and showed that the data did not violate the assumption of multicollinearity, linearity, normality, and homoscedasticity. The variables of interests were entered in four steps. Demographic variables such as age, gender, and relationship status were controlled as covariates and entered subsequently in step 1, as previous research has identified that aggressive behaviors are different across gender (e.g., Buss & Perry, 1992; Murray-Close et al., 2010). In the next step, anger was inputted independently since it was identified as the prominent factor leading to aggressive actions in past research (Anderson & Bushman, 2002; Wyckoff, 2016) and the correlation analysis. In the third step, escalating strategies and negative attributions were added into the model to assess their

independent contribution in predicting aggressive behaviors. Lastly, self-awareness and calming strategies were entered in step 4. The same process was followed for the different forms of aggression.

In the final models (see [Table 2](#)), age contributed to the prediction of physical and romantic relational aggression but not verbal aggression, suggesting that older participants reported lower levels of physical and romantic relational aggression. Gender arose as a significant predictor for both physical and verbal aggression subtypes, suggesting that males are more likely to display these forms of aggression. As hypothesized, the result of the final models indicated that anger significantly predicted elevated levels of physical, verbal, and relational romantic aggression. The anger management sub-factors such as negative attributions and escalating strategies had significant predictive ability on the display of romantic relational aggression, but not for the other two forms of aggression. Contrary to the hypotheses, calming strategies significantly and uniquely contributed to the increase of romantic relational aggression.

All of the predictors included in the final regression models explained 42.5% variance in physical aggression, 43.3% in verbal aggression, and 34.1% in romantic relational aggression. However, it can be seen that when anger was entered independently, it made the highest contribution explaining 38% of the variance for physical aggression, 38% for verbal aggression, and 17% for relational aggression (step 2). Interestingly, the anger management components contributed less to physical and verbal aggression. The maladaptive anger management strategies explained an additional 10% of the variability of romantic relational aggression and 1% of physical aggression and had no contribution for verbal aggression. Positive management strategies (self-awareness, calming strategies) contributed to 3% of the variance explained for romantic relational aggression and had no impact on physical and verbal aggression.

Discussion

Anger (the emotion) has been found to be a prominent factor that precedes aggression (Crane & Testa, 2014) as one of its functions is to express displeasure in an attempt to resolve conflict (Novaco, 2017). Anger regulation was introduced as a way to reduce and minimize angry feelings and their consequences that often lead to aggressive acts. The present research examined the association between anger, anger management strategies in different forms of aggression (physical, verbal, and relational) in a community-based adult population. This study contributed to the current literature that supports the distinct pattern of predictors of physical, verbal, and relational aggression (Crick & Grotpeter, 1995). The first aim of the present study was to investigate whether anger (the emotion) and anger management strategies were

significantly associated with physical, verbal, and romantic relational aggression. As expected, higher levels of anger were significantly associated with greater likelihood to display all forms of aggression: physical, verbal, and relational aggression in romantic relationships, and is aligned with previous findings examining anger in physical and verbal aggression (e.g., Buss & Perry, 1992) as well as relational aggression (e.g., Dahlen et al., 2013; Prather et al., 2012). Adding to previous literature investigating anger management strategies and aggression (e.g., Shorey et al., 2014; Stith & Hamby, 2002), the current findings indicate that managing anger with different strategies was associated with relational romantic aggression as oppose to physical and verbal aggression. Specifically, individuals frequently applying escalating strategies and negative attributions were associated with higher levels of relational aggression but not physical or verbal aggression.

The second aim of this study was to determine which factors contribute to the prediction of physical, verbal aggression in general (toward others), and relational aggression specifically in intimate partner relationships, thereby identifying the distinctive underlying factors of the different aggression forms. Anger and four anger management strategies were entered step-by-step in the hierarchical regression analysis to identify the independent contribution of each, on the aggression subtypes. Results indicated that anger arose as the strongest predictor for the three types of aggression which is aligned with prior work (Buss & Perry, 1992; Dahlen et al., 2013). Anger management components showed non-significant contributions for physical and verbal aggression, indicating that anger was a robust precursor of aggressive behavior above and beyond other cognitive and behavioral components often included in different anger management strategies. This finding suggests that anger often inhibits the cognitive process (e.g., moral reasoning and judgment) which are important when reappraising provoking situations (Anderson & Bushman, 2002). Our findings are aligned with prior work showing that anger is predominantly accompanied by physical arousal and lack of impulse control, which consequently drives the physically harmful actions, such as hitting another person and harming others using spoken words (Berkowitz, 2012; Buss & Perry, 1992).

A number of studies (e.g., Howells et al., 2005; Lee & DiGiuseppe, 2018; Novaco, 2017) suggested that interventions targeting anger are effective in mitigating aggression including physical and verbal behavior. While anger management treatments have demonstrated consistent moderate effectiveness among both clinical and non-clinical populations, treatments focusing on aggression have been less consistent (Lee & DiGiuseppe, 2018). Anger management techniques comprise of cognitive components (conscious deliberation technique) which might not be effective in situations where the individuals anger levels are high, because people with difficulties regulating their anger might respond to situational triggers rapidly and impulsively,

before they can consciously recognize the problem (Short, 2016). This study suggests that anger is a prominent factor specifically associated with physical and verbal aggression, relational aggression too; however, anger management strategies seem to be less associated with physical and verbal aggression even though these anger management strategies are often offered in treatment efforts for violent offenders (Howells et al., 2005).

Unlike physical and verbal aggression, cognitive factors (e.g., negative attribution) and behavioral components of anger management strategies (e.g., calming and escalating strategies) were found to be associated with relationally aggressive behavior. This suggests that relational aggression comprised of manipulative behavior to damage the relationship was predominantly influenced by anger and the lack of ability to inhibit the escalation of anger and bias in the attribution process (e.g., blaming the partner and having negative intentions against the partner). Previous research investigating predictors in romantic relational aggression has found that cognitive factors, such as normative beliefs of aggression and rumination, were specific predictors in relationally focused type of aggression (Goldstein, 2011), which is consistent with the present findings highlighting the interplay of cognitions (e.g., negative attribution) as a risk factor of developing relational aggressive behaviors. According to the social information processing theory, people tend to display biases when they interpret the behaviors of others to infer attributions about their motives even when the situation is ambiguous (Crick & Dodge, 1994). Wallach and Sela (2008) showed that perpetrators of intimate partner violence were more likely to report hostile attribution bias toward their partner. For example, they made an attribution that the negative behaviors displayed by their partner were intended to inflict their anger (Wallach & Sela, 2008). A study by Chen et al. (2014) also found that hostile attribution bias was a predictive factor of relational aggression in adults and Thomas and Weston (2020) found that people with higher levels of hostile attribution bias were more likely to act aggressively toward their partners. All of these findings indicated that a tendency to negatively evaluate the intimate partner's intentions, can lead to higher levels of relational aggression (Calvete et al., 2014).

Contrary to our predictions, calming strategies were not negatively associated with the different aggressive forms that were assessed in this study but arose as a significant predictor for relational aggression which was surprising, considering that the calming techniques are conceptualized to decrease the likelihood of violence and aggression (Stith & Hamby, 2002). The results from the current study suggest that calming yourself had a small but significant positive association only with romantic relational aggression, suggesting that this strategy is not effective when dealing with relational aggression in romantic relationships. This could be due to the fact that calming techniques (e.g., taking time out to calm down, when the partner is flirting or manipulating)

might indicate the use to some extent of normalizing the maladaptive behavior or avoiding to address it, leading to interpersonal problems (Shorey et al., 2014), which possibly exacerbates relational conflict in the long run. The current findings suggest that frequent use of calming strategies might be less effective in the alleviation of romantic relational aggression. This is supported by a recent study (Hayes et al., 2021) which found that dating aggression was predicted by romantic exclusivity, normative beliefs about relational aggression, and peer relational aggression. Calming strategies in this context might be aiding normative beliefs regarding relational aggression. Potentially, the frequent application of these calming strategies does not necessarily reduce the individuals' negative attribution associated with angry feelings as shown in prior work (e.g., Shorey et al., 2014).

Limitations and recommendations

Despite the study's strength in distinguishing the relationship between anger and anger management strategies in physical, verbal, and romantic relational aggression, the present study has some limitations that need to be addressed. First, a cross-sectional design was used limiting the ability to draw causal inference. An actual anger management intervention using an experimental design is warranted in evaluating the causal relationship of anger, anger management, and aggression. Future research should replicate these findings in a broader set of populations (e.g., clinical sample of violent participants) and include couples in a relationship to aid our understanding of the relevance of the current results. Second, the regression model of anger and anger management strategies explained smaller variance in romantic relational aggression compare to that of physical and verbal aggression, indicating that other variables which were not assessed in the current study might have greater contribution to relational aggression perpetration. Therefore, it is suggested that future studies extend these findings by also including other types of negative emotions (e.g., jealousy and sadness) as prior work shows that these factors were associated with relational aggression (Sullivan et al., 2010).

Implications for clinical practice

The current study highlighted the fact that anger plays a significant role in the display of the different types of aggressive behavior (physical, verbal, and romantic relational), raising further concern of the importance of anger management for mitigating the effects associated with aggressive actions (Liu et al., 2013). However, our findings suggest that anger management has an impact on romantic relational aggression but not physical or verbal aggression. Future prevention and intervention programs would require to first

distinguish the different types of aggression displayed (physical, verbal, romantic relational) and target different components of anger management strategies depending on the different forms of aggression displayed. Intervention efforts that address physical and verbal aggression need to focus on helping individuals to recognize their anger-associated thoughts, physical arousal and impulses, and to dampen the effect of the emotion of anger on aggression (Berkowitz, 2012; Novaco, 2017) as this research confirms that anger alone has a significant contribution for these forms of aggression. This technique might be useful in reducing anger from being escalated which would in turn minimize the likelihood of aggressive acts. Likewise, this strategy seems to apply for relational aggression in intimate relationships too. However, for romantic relation aggression calming strategies were not effective in reducing this form of aggression. Instead, it is recommended to target the cognitive components (e.g., negative thoughts associated with anger) through the perspective-taking technique (Joseph & McLeod, 2014), to reduce bias in the attributional process in preventing romantic relational aggression. Treatment targeting attribution bias can potentially be effective as previous studies also suggested that interventions focused on socio-cognitive components in processing social cues can be effective in reducing intimate partner aggression (Murphy, 2013; Setchell et al., 2016).

Conclusion

The present study examined the relationship between anger, anger management strategies, and three forms of aggression. The findings suggest that difficulties in managing feeling of anger would increase the propensity of enacting physical, verbal, and romantic relational aggressive acts. Negative attributions about the partners intentions, the frequent use of escalating and calming strategies to deal with angry feelings were risk factors for displaying relational aggression. The current findings are noteworthy; providing better understanding regarding the relationship between anger (the emotion) and aggression (the behavior) and contribute to the literature by revealing the role of anger management strategies on romantic relational aggression. Lastly, prevention and treatment efforts hoping to address relational aggression in romantic relationships need to reduce anger levels and maladaptive anger management strategies (escalating thoughts and attrition bias) while avoiding calming strategies.

Disclosure statement

No potential conflict of interest was reported by the authors.

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