



The Influence of Aggression-Evoking Cues on Aggressive Cognitions in Males and Females: Different Procedures – Similar Effects

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Abstract

Three experiments examined the effect of aggression-evoking cues on aggressive cognitions related to physical, verbal, and relational aggression and internal states (anger and hostility). In Experiment 1 ($n = 40$), the priming effect of masculinity threat on four categories of aggressive cognitions was investigated among males; Experiment 2 ($n = 46$) tested whether exposure to images stimulating negative and sexual arousal induced higher accessibility of aggressive constructs in men; in Experiment 3 ($n = 95$), female participants completed a self-report questionnaire measuring aggressive behavior, administered so as to activate their aggressive cognitions. All three studies revealed that, when the concept “aggression” is activated, the accessibility of physically aggressive thoughts increases regardless of the participant’s sex or the sorts of stimuli used to evoke aggressive cognitions. Thoughts related to verbal and relational aggression, anger, and hostility were not activated. The findings are discussed in terms of the cognitive-neoassociationistic model of aggression in which physical aggression may play the role of the core of an aggression cognition network that is easily activated without spreading that effect on associated constructs.

Keywords Aggressive cognitions · Aggression priming · Negative arousal · Sexual arousal · Masculinity threat

Introduction

Studies into the effects of activation of certain constructs in memory on aggressive thoughts and behaviors have become the basic cognitive approach in explaining and predicting human aggression (Anderson and Bushman 2002; Berkowitz 1990; Engelhardt and Bartholow 2013). To show the cognition–aggressive behavior interplay, previous research has focused either on priming with aggression-related words and scripts or activating a self-threat that triggers compensatory mechanisms including aggression.

The first approach is based on the cognitive-associative theory of aggression by Berkowitz (1990), who proposed the idea that stimulating the specific aggression construct in memory leads to spreading the activation to associated

constructs. As a result, the primed constructs become more accessible in memory and influence information processing. The idea stems from the spreading-activation theory (Collins and Loftus 1975), which primarily described the functioning of semantic memory. For example, if concepts such as “gun,” “anger,” and “killing” share a similar meaning (i.e., gun is an instrument used in anger-evoking situations which may lead to killing someone), then these concepts should be placed close together in a semantic network. Thus, when the concept of “killing” is activated, other similar concepts become more accessible in the memory. Previous research has confirmed that priming the aggression-related cues leads to higher accessibility of aggression-related cognitions. For example, Anderson et al. (1998) showed that priming by a weapon increased the access to aggressive words which were recognized faster than nonaggressive words. In addition to the priming effect of aggressive words, aggressive activity can play the same role. Another study showed that playing violent games compared to playing nonviolent games increased the percentage of aggressive word completions (Anderson et al. 2004). Similarly, Bushman and Geen (1990) found that the number of aggressive cognitions was greater when individuals were primed with violent films.

Further research testing the assumptions of the cognitive-associative theory of aggression went even farther, beyond the

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idea of priming with exclusively aggressive words to increase aggressive thoughts. For example, Bartholow and Heinz (2006) showed that, after alcohol-related priming, participants responded faster in a lexical decision task when it referred to aggression-related words than when neutral priming was used. Similarly, Mussweiler and Förster (2000) showed in a lexical decision task that activation of sex-related concepts (e.g., skin, bed, sweat) automatically activated aggression-related concepts (e.g., violence, brutal, murder). It seemed that the presentation of “alcohol” and “sex” concepts activated the “aggression” concept as a closely linked idea. This association had to develop due to frequent experiences in which alcohol intoxication and sexual situations involved aggressive elements. Indeed, alcohol intoxication facilitates aggressive behavior (Bushman and Cooper 1990).

The second approach has focused on activating the self-threat which results in impaired self-control and performance decrements. For example, the classic studies of Steele and Aronson (1995) on the stereotype threat showed that activating the stereotype of one’s own group lowers performance in the stereotyped domain. However, subsequent studies demonstrated that coping with negative stereotypes can spill over into other domains. Thus, an individual is prone to undertake any actions, even those not associated directly with the stereotype-threatening situation, as long as a given behavior could fulfill compensatory functions. For instance, in a study by Inzlicht and Kang (2010), women who took part in a challenging math test and then were provoked by their partner of interaction undertook an aggressive retaliatory behavior only when aggression was the sole way to cope with the stereotype threat. Those participants who had an opportunity to cope with such a stressful situation by cognitive reappraisal did not manifest aggressive behavior. Further analyses showed that aggression under condition of stereotype threat stems from the loss of self-control induced by the threat. Thus, aggressive behavior appeared to be a way to regulate emotions if no other solution is available.

The role of impairment of self-control in aggression is also underlined in studies involving self-threat. Previous studies showed that such a challenge for the self as social rejection or exclusion increases aggression (Twenge and Campbell 2003; Wesselmann et al. 2010), partially because of the loss of effective capacity for self-regulation by people with such aversive social experience (Baumeister et al. 2005). One possible explanation why self-threat is followed by emotional dysregulation is that a self-threat condition might lead to diminished cognitive capacities, which lead to more impulsive behaviors including aggression (Baumeister et al. 2002; Leary et al. 2006).

In three experiments, we focused on the effect of exposure to aggression-evoking cues on aggressive cognitions. Specifically, we tested whether aggressive cognitions might be manifested in higher accessibility of words related to:

physical, verbal, relational aggression, and the internal states responsible for aggressive outburst. Thus, in contrast with previous research, we went beyond measuring general aggressive thoughts and instead tried to catch the different forms of aggression at the level of cognition. Two approaches indicated above were employed to explore the priming effect on aggressive thoughts, namely (1) priming aggressive cognitions with stimuli related to aggression and (2) inducing aggressive cognitions with self-threat. Experiment 1 was theoretically grounded in the second approach, as it aimed at testing whether masculinity threat can heighten aggressive cognitions. Experiment 2 and 3 were embedded in the first approach represented by the cognitive-associative theory of aggression (Berkowitz 1990), which spotlights the role of aggression-related cues in activating aggression cognitions and the spreading effect on associated constructs. Thus, anxiety-evoking and sexually stimulating pictures, as well as the Aggression Questionnaire, were used as the primes to evoke aggressive cognitions in four categories: physical aggression, verbal aggression, relational aggression, and internal states related to aggression (anger and hostility). To sum, three experimental procedures were utilized to give an in-depth recognition about what sorts of stimuli are responsible for what kinds of aggressive cognition in males (Experiment 1 and 2) and females (Experiment 3).

The Current Research

The purpose of the present article was twofold: first, to test the priming effect on aggressive cognition by measuring the accessibility of four distinct categories of aggressive constructs as opposed to previous research focused on activating aggressive cognitions at general level, and second, to employ different experimental procedures with typical male primes (Experiment 1 and 2) and neutral primes (Experiment 3) for testing and comparing the priming effect on different categories of aggressive thoughts in males and females.

In all three experiments, aggression-related thoughts were measured using the experimental Polish version of the Word Completion Task (Anderson et al. 2004), which contains one substantial change compared to the original version. In previous studies in which the measure developed by Anderson was used, responses were coded into two main categories of aggressive or neutral words. Thus, the category of aggressive words covered all possible associations that were related to aggression (e.g., kick, shout, rapists, prison, poison, anger, cruel). In the experimental Polish version, participants were also asked to fill in the missing letters to create a word, wherein each diagnostic item might be completed in an aggressive or non-aggressive manner. However, within possible aggressive completions, words may be completed in a way referring to physical, verbal, and relational aggression and internal states (anger and hostility). Thus, the aim of the three studies

was to explore the effect of aggression priming on aggressive thoughts when different categories of these aggressive thoughts were differentiated.

Distinguishing different types of aggressive cognitions seems to be important due to well-documented sex differences in aggression. Several meta-analyses have shown that men tend to be more physically aggressive than women, and to a lesser extent more verbally aggressive, whereas women manifest more relational aggression than men do (Archer 2004; Bettencourt and Miller 1996). At the same time, there are no sex differences in anger. The cognitive route is postulated to be one guiding mechanism between stimuli and aggression (Anderson and Bushman 2002; Berkowitz 1990); i.e., aggressive behavior is more probable due to activation of aggressive cognitions. The question arises: what kinds of aggressive cognitions are activated in males and females?

Secondly, in previous studies, different types of aggressive cognition priming procedures were used, starting from subliminally or consciously presenting a sexual or aggressive prime word (Anderson et al. 1998; Mussweiler and Förster 2000) through playing violent video games (Anderson et al. 2004), to inducing a gender-identity threat (Vandello et al. 2008). Each concept in memory has an activation threshold (Anderson et al. 1998); thus, various aggression-priming procedures should have diverse abilities to exceed the “aggression” concept threshold and evoke substantial changes in aggressive thoughts and aggressive behavior. From this point of view, the type of prime that is adopted in the studies can make a difference. In previous studies, mostly the typical male primes, like playing a violent baseball game (Anderson and Carnagey 2009) or experiencing a masculinity threat (Vandello et al. 2008) were adopted. However, the more relevant the prime is for a participant, the stronger an effect should be expected. When typical masculine primes among males are used, their effect on aggressive cognitions should appear mostly in case of physical aggressive cognitions, since physical aggression is typical for males. However, female aggression is guided by the rule of low risk, which means that physical aggression is avoided because retaliation for physical aggression is highly probable and the likelihood of being injured increases (Campbell 2006). Thus, relational and to some extent verbal aggression meets the requirements of so called “effect/danger ratio” (Björkqvist 1994) better than does physical aggression, but little is known about whether this rule also refers to aggressive cognition. The question to be explored is, namely: what are the cognitive effects of priming physical aggression in females, and are these effects different when one also primes verbal, and relational aggression as well as internal states related to aggression? Finally, if physically aggressive behavior is rejected by females, does it inevitably mean that cognitively, instead of physically, relationally aggressive thoughts will prevail? Alternatively, physically aggressive cognitions might be evoked in the first instance

regardless of the type of prime, and then thoughts might be sublimated into such forms of aggressive behavior as better fit the gender role.

To sum up, in three studies, the aggressive cognitions were activated using different experimental procedures. In Experiment 1, a masculinity threat was used to prime aggressive constructs in an exclusively male sample. Considering previous research showing the far-reaching consequences of the threat for the self, one can assume that a masculinity threat might also foster strong effects on cognitive processing. When men experience threats to their masculinity, an aggression-related cognition could be activated because through physical aggression masculine status could be restored quickly and effectively (Vandello et al. 2008).

In Experiment 2 anxiety-related and sexual stimuli were used to prime aggressive thoughts in men, while in Experiment 3 female participants completed the self-report questionnaire about their own aggression to activate their aggressive cognitions. In each experiment the range of spreading activation was considered by verifying whether priming had the effect on physical, verbal, and relational aggression as well as on internal states regulating aggressive manifestation.

Experiment 1

Overview and Hypothesis

One of several explanations of the sex differences in aggressive behaviors refers to the masculinity threat phenomenon. Compared with womanhood, manhood is a precarious social status which might be easily lost when a man gains information that he possesses typical female features or behaves in a feminine way. The masculinity threat triggers psychological mechanisms and behaviors aimed at validating or restoring impaired masculine identity. But only these behaviors which are a part of men’s cultural stereotype might restore and reaffirm masculinity. Therefore, studies show that men respond to threats to their manhood with aggressive emotions and behaviors (Berke et al. 2016; Vandello et al. 2008; Cohn et al. 2009; Bosson et al. 2009) since aggression is stereotypically related to masculinity. However, the most effective efficient means of reaffirming manhood are those behaviors that involve risk taking, are related to potential costs, and are visible to others (Weaver et al. 2010). Thus, the masculinity threat should evoke physical, but not relational, aggression, since relational aggression is typically feminine and does not fulfill the criteria described above. It has been already shown that, in the masculinity-threat condition, compared with the masculinity-affirmation condition, males completed more words in a physically aggressive manner, an effect that was not observed when the Word Completion Task was related to relational aggression (Vandello et al. 2008). Verbal aggression is visible

to a similar extent as physical aggression; however, it is not so much masculine-typed aggression as physical aggression (Archer 2004) and entails less risky or costly behavior. Moreover, studies of the approval of aggressive acts repeatedly show that people tend to accept verbal aggression more than physical aggression (e.g., Ramirez 1993), which suggests that it might be regarded as a normative behavior in some social interactions. It implies that undertaking verbally aggressive acts, even if inappropriate in some situations, is still being approved. Taking these results into account, it was hypothesized that the masculinity threat would heighten accessibility of physically aggressive words compared with the masculinity-affirmation condition. The effect of masculinity threat should not appear for relationally and verbally aggressive cognitions.

The open question was whether the masculinity threat would influence accessibility of thoughts related to internal states. The “internal states” subscale of the WCT consists of words related to anger and hostility, which remain hypothetical states in the eye of the beholder unless they are manifested in an observable behavior. From this point of view, potential differences in state-related words in threat and affirmation conditions should not appear. However, if affective, cognitive, and arousal routes from situational input to aggression are related to each other (Anderson and Bushman 2002; Berkowitz 1990), threatened males should have anger- and hostility-related thoughts more available than males in the gender-affirmation condition.

Yet, even if males, unlike females, are susceptible to gender-identity threats, it could be presumed that this effect should be expressed more when a man adjusts to the masculine stereotypes. Gender schema are developed in every human being (Markus et al. 1982), but some individuals use it very often in information processing and are susceptible to information related to gender (Markus et al. 1982; Yan et al. 2012). Previous studies showed that the masculinity threat exerts its effect primarily among masculine males (Babl 1979) and men who strongly identify with their gender group (Maass et al. 2003; Schmitt and Branscombe 2001). Thus, it was hypothesized that the effect of a masculinity threat on accessibility of physically aggressive words would be moderated by the level of masculinity.

Method

Participants

Forty men (all Caucasians), 18–19 years old ($M = 18.15$, $SD = 0.36$), participated in the study. They were students of two high schools who wanted to take part in the study without any financial or other incentives. The study was conducted in groups of 10 during after-school hours.

Materials and Procedure

Participants were informed that the study was designed to measure cognitive functioning and social behavior among men and that it would be conducted in two parts. During the first part, men completed the Gender Identity Inventory (GII) by Kuczynska (1992), a measure constructed on the basis of Bem’s (1981) Gender Schema Theory, which allows for the measurement of masculinity and femininity. The whole inventory includes 35 adjectives, among which 15 represent stereotypically feminine traits (Femininity scale), 15 correspond to stereotypically masculine traits (Masculinity scale), and 5 adjectives serve as buffer items. Participants rate the degree to which each adjective describes them on a 5-point scale from 1 – “I am not like that at all” to 5 – “I am exactly like that.” In this study, the internal reliability of both scales was good, with Cronbach’s $\alpha = .81$ for Masculinity and $.79$ for Femininity. After completion of the GII, men were left for one hour, ostensibly so the experimenter could count the test results. After this time, the experimenter came back to the room and handed the test result to each man using the first 6 digits of each man’s Social Security number for identification. The results, worded as “psychological gender–feminine” or “psychological gender–masculine” were in fact randomly assigned. Half of the participants ($n = 20$) obtained results which said that they were masculine (Masculinity Affirmation, MA) and served as the comparative group for another half ($n = 20$), who learned that they were feminine. Information passed to men about their ostensible femininity was meant to be threatening to their masculinity (Masculinity Threat, MT).

After the Masculinity Threat procedure, the participants were asked to fill in the Word Completion Task under the title “Test of Language Skills” (TLS). Participants were given an unlimited amount of time to work on the task; however, they were instructed that they should not think too much and write the first word that came to their minds. The task contained a list of 32 words with one or two letters missing, including 23 diagnostic words and 9 buffer words. Participants were asked to fill in the missing letters to create a word, wherein each diagnostic item might be completed in an aggressive or non-aggressive manner. Within possible aggressive completions of the words, 12 words might be completed in a way clearly referring to physical aggression (e.g., blood; weapon); 5 words could be attributable to verbal aggression (e.g., scream; mockery); 3 words could be completed in a manner indicative of relational aggression (e.g. rumor; backbite); and finally, 3 words might correspond to internal states related to aggression such as anger (furious) or hostility (hostile). Although word stems were chosen to allow differentiation between categories of aggressive cognitions in the above-stated manner, some words could be completed in more than one manner, indicative of aggressive cognition. For example, item L_NIE could

be filled in both as LANIE (spanking) or LUNIE (to whack); item _ROGI could be completed both as WROGI (hostile) or SROGI (fierce). Thus, the aggressive cognitions (AC) index was based upon all aggressive words that were generated by participants in the three studies (described further below). There were 14 words in the Physical Aggression category: blood, spanking, to whack (additional way of completing a word), wound, to attack, bruise, war, assault, fight, de cease, scuffle, to kill, to stick (additional), weapon. The Verbal Aggression category included the following six words: insult, scream, to defy, to sue (additional), mockery, shriek. There were five Relational Aggression words: to crab, to scoff, to blurt, rumor, to lie. Finally, the Integral State scale contained these five words: tension (additional), furious, hostile, fierce, anger. Scoring started from coding the responses into the two categories (aggressive or non-aggressive), and next the mean aggressive words frequency was calculated for each form of aggression. The means were multiplied by 10 to minimize the number of zeros.

With the completion of TLS, the study ended and the participants were thanked and debriefed.

Results

Correlation analysis showed that AC categories were not significantly related to each other ($r < .22$, $p > .16$). Age was not related to Physical Aggression, PA AC ($r = -.10$, $p = .53$), or any other AC category, ($r < -.19$, $p > .22$), Masculinity ($r = .11$, $p = .47$) or Femininity ($r = -.093$, $p = .56$), so it was not controlled in further analysis. Also, Masculinity and Femininity distribution were similar in MT (coded 1) and MA condition (coded 0). Conditions were not related to Masculinity ($r = -.02$, $p = .89$) or Femininity ($r = -.11$, $p = .47$) and variances of Masculinity were not different between conditions ($F(1,39) = 0.66$, $p = .42$), as well as variances of Femininity ($F(1,39) < .001$, $p = .98$). Mean Masculinity in MT condition was $M = 55.05$, $SD = 8.69$, and in the MA group it was $M = 54.70$, $SD = 7.89$. In case of Femininity, in Masculinity Threat $M = 49.60$, $SD = 7.78$ was observed, and, in MAM $M = 47.70$, $SD = 8.86$ was obtained. These results indicated that low and high Masculinity or Femininity indices were comparable across conditions, which should be the case if participants were randomly allocated to experimental groups.

In this study, it was predicted that there would be more aggressive supplementation of PA AC items in the MT than in the MA condition, so it was a design with one independent variable and two conditions (MT, MA). Results showed that the effect of manipulation (Masculinity Threat, Masculinity Affirmation) on the Physical Aggression word completion was significant ($t(1,38) = -2.64$, $p = .012$, $d = -0.84$). Men in the MA condition exhibited less PA CA ($M = 3.69$, $SD = 1.40$,

95% CI [3.11, 4.27]), than participants in the MT condition ($M = 4.77$, $SD = 1.16$, 95% CI [4.18, 5.35]). The analysis conducted for other three categories of aggressive words showed no significant results ($t < 1.28$, $p > .21$).

Further, the effect of MT/MA on aggressive cognitions including the Masculinity and Femininity test results (and their products with MT/MA) was explored, using hierarchical multiple regression. In the first model the main effects of Masculinity, Femininity, and conditions were included, and in the second model interactions of Femininity and Masculinity with conditions were added. The results showed that the first model explained the significant amount of variance in the PA AC ($R^2 = .25$, $F(3,36) = 3.89$, $p = .016$). See Table 1 for regression analysis results.

The PA AC was higher in the MT than in the MA condition ($B = 1.05$, $SE = 0.40$, $t = 2.64$, $p = .012$), and Masculinity had the negative main effect on PA AC ($B = -0.41$, $SE = 0.20$, $t = -2.06$, $p = .046$). Interactions added in the second step worsened the predictive power of the model ($R^2 = .27$, $F(5,34) = 2.54$, $p = .047$, $F_{\text{change}}(2,34) = 0.63$, $p = .539$) and were insignificant $B < 0.46$, $t < 1.11$ and $p > .272$. The models with other aggressive word categories as dependent variables were also tested, but none of the main or interactive results were significant.

Discussion

The results obtained supported the hypothesis that MT would heighten accessibility of physically aggressive words compared with the MA condition. The MT did not trigger relationally and verbally aggressive words, or cognitions related to anger and hostility. The results support the notion that physical aggression is prototypical behavior for men, and remains probably the strongest sex-typed form of aggressive behavior. The meta-analyses of sex differences in aggression in real-world settings (Archer 2004) have shown, indeed, that the effect size in the male direction was highest in the case of physical aggression. Simultaneous effect sizes for verbal aggression were smaller than those for physical aggression, and appeared relatively low (but in the female direction) when peer ratings of indirect aggression were verified. These results are arranged in a pattern from the most to the least noticeable aggressive manifestations. Thus, similarly to previous studies in which the masculinity threat induced physically aggressive behavior (Bosson et al. 2009), in our study the MT evoked AC only in the PA category.

The level of masculinity (as measured by the GII) did not moderate the effect of MT on aggressive thought. Moreover, an unexpected finding in Study 1 was that, together with a higher level of masculinity, a lower level of PA AC was observed. This tricky result needs to be replicated and explained

Table 1 Effects of MT and Masculinity-Femininity traits on aggressive words frequency in Physical Aggression category of Aggressive Cognitions (Masculinity-Femininity indices were zero-centered)

Variables in Model 1	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Constant	3.70	0.28		13.20	< .001
Masculinity Threat (ref: Confirmation)	1.05	0.40	.38	2.64	.012
Masculinity	−0.41	0.20	−.30	−2.06	.046
Femininity	−0.03	0.20	−.02	−0.15	.884
Model 1 R^2 / R^2 adjusted	.25/.18				
Model 1 <i>F</i>	*3.89				
Model 2 R^2 / R^2 adjusted	.27/.17				
Model 2 <i>F</i> / <i>F</i> change	*2.54/0.63				

in further studies, but it seems that having the deeply elaborated aggressive-related concepts in memory does not mean an inevitable usage of them in each social situation. Taking together the results of study 1, one can conclude that this aggressive-associative network is just a potential to be used when needed, e.g., under MT conditions, but masculinity by itself in a non-threatening situation does not imply more aggressive cognitions. In line with the evolutionary approach, masculinity implies undeniably the need to dominate others with aggression as only one way of exerting control over them (Bjorklund and Pellegrini 2002). Further strategies include, for example, cooperative behaviors and reconciliatory strategies after using force. Such a wide range of social behaviors that may be used by those high in masculinity implies that the pattern of their behavior under non-threatening conditions may be completely different than under threatening conditions. This could be one of the reasons why, in study 1, masculinity itself was related negatively to PA AC, while the MT gave the reverse effect. In sum, instead of aggression, masculinity may encourage to a greater extent the dominant behaviors expressed nonaggressively, but a threatening condition leads inevitably to the need to restore masculinity as fast and efficiently as possible; thus, aggression seems to be the most effective way.

The second and complementary explanation is that, among study participants, aggression was not the strongest element of the masculinity schema. Masculinity is considered to reflect traits that are rather socially desirable for most men. Dijksterhuis and colleagues showed that memory impairment after priming of the category “elderly” is predicted by the strength of association between the elderly concept and forgetfulness (Dijksterhuis et al. 2000). In turn, from the “active-self” point of view (Wheeler et al. 2007), knowing whether the construct is a part of the active self-concept seems to be crucial. Thus, the level of masculinity in evoking aggressive cognitions after the MT may count, but only when aggression is strongly ascribed to the masculine self-schema. Although aggressive behaviour is more accepted in males and more normative for them (Eagly and Steffen 1986), it is possible that the trait of aggressiveness was not self-descriptive for participants in study 1.

Experiment 1 demonstrated that, when masculinity is threatened, physically aggressive cognitions are activated, but not other forms of aggressive thoughts. The effect was strong ($d = 0.83$), supposedly because “not to be feminine” is a core factor of male identity (Kierski and Blazina 2009), regardless of the level of masculinity understood as an extent to which a man or woman displays stereotypically masculine traits measured by Gender Identity Inventory. Thus, when masculine identity is undermined, which is a stressful and aversive experience for males (Berke et al. 2016; Caswell et al. 2014), the most effective compensatory mechanisms engage immediately; here, it was PA AC.

Experiment 2, also conducted on males exclusively, aimed to verify whether adopting a different kind of prime would also exert an effect of solely physically aggressive cognitions. Stimuli used in Experiment 2 to prime aggressive cognitions were supposed to induce negative and sexual arousal, unlike Experiment 1 in which a salient self-aspect was engaged, i.e., the masculinity threat.

Experiment 2

Overview and Hypothesis

In the second experiment, the concept of “aggression” was activated in a different manner than in study 1. Namely, instead of engaging the self, sexual and anxious arousal was activated in male participants. Two sets of images were presented that were designed to induce two kinds of arousal among participants: sexual arousal and negative arousal. Posner and colleagues in their circumplex model of affect (Posner et al. 2005) proposed that all affective states can be understood along the “pleasure–displeasure” continuum (related to valence) and the “activation–deactivation” dimension (related to arousal, activity, or alertness). In the face of this dichotomy, both kinds of experimentally evoked states could be seen as high on the activity dimension, but sexual arousal would mainly refer to pleasure and negative arousal to the displeasure point in the valence dimension.

Previous studies have shown that inducing negative affect heightened both the aggression and the accessibility of aggressive and hostile cognitions (Mammen et al. 2002; Nederlof et al. 2014). It is in accordance with Berkowitz's (1990) statement that negative affect primes aggressive feelings and thoughts provided that it triggers "fight," i.e., responses related to anger mechanisms. The second type of reaction—"flight," which refers to fear and escape-avoidance responses—should result in the inhibition of aggression. However, both anger and anxiety, because of their similarity in the pleasure and arousal dimensions (Nederlof et al. 2014; Posner et al. 2005), could induce aggressive responses.

The association of sex and aggression has also been a topic of much research in psychology (Imhoff et al. 2013; Mussweiler and Förster 2000). Previous studies have shown that, when individuals are exposed to sexual stimulation, they manifest higher levels of aggressive cognitions, tendencies, and behaviors as well as attitudes supporting aggression. However, sex differences were found to be salient. Although females are to some extent susceptible to the sex-aggression link, the strength of this association is much weaker than for men (Murnen and Stockton 1997). As a result, sexual stimuli are not enough to trigger aggressive behavioral tendencies in women, as opposed to men (Mussweiler and Förster 2000). The priming effect of sexual stimuli on aggression increments in men is explained with regard to the excitation transfer theory (Zillman 1971), according to which sexual stimuli produce unspecific excitation, which is similar to anger arousal and which transfers to subsequent aggressive behavior. However, not only emotional, but also cognitive mechanisms could play the role in this link. Mussweiler and Förster (2000), using the sequential priming paradigm, showed that the presentation of sex-related primes facilitated lexical decisions for aggression-related words coded simply into two categories: aggressive and neutral words. It means that not only the emotional, but also the cognitive, route from sexual stimulation to aggression is possible. Sexual acts are often presented in pornographic images and videos in a specific manner, i.e., physical aggression and dominance are for some individuals sort of behaviors which enable sexual satisfaction to be reached, not only by males as perpetrators, but also by females as submissive parties. This power–sex relation was also experimentally confirmed (Bargh et al. 1995). Thus, aggressive behavior in sexual situations might be highly rewarding, which enhances the sex–aggression link.

In this study, it was hypothesized that eliciting sexual and negative arousal (SA, NA) among participants would be related to a higher level of PA AC, in comparison with a no-arousal (No-A) condition. Considering that both negative and sexual arousal have been related to aggression in previous studies, it was an open question which kind of arousal would have a stronger effect on PA AC.

Method

Participants

All 46 participants were Caucasian men, students of various Warsaw universities, aged 20–26 ($M = 22.86$, $SD = 1.35$). Individuals participated voluntarily, anonymously, and without any monetary or other incentive.

Materials and Procedure

The study was conducted with individual participants. They were informed that the purpose of the study was to explain how different stimuli affect cognitive functioning and that during the study sexual or drastic photographs might be presented but it was possible to cease their participation at any moment. No participant did that.

After signing the informed agreement, participants described their mood on a 10-point scale, and next the experimenter left the room for two minutes. The arousal manipulation procedure began with watching color photographs shown on a computer screen. Each photograph occupied the whole 15-in. diameter screen and was presented for 3 s. The presentation lasted for 80 s. There were 40 photographs chosen in each category: sexually arousing, stressing or negatively arousing, and not arousing. The selection of the photographs for inclusion in the stimuli set was based upon 10 male judges' evaluation as to whether particular photographs might evoke sexual excitation or stress/negative feelings. Judges were presented with 60 photographs in two arousal categories. The 40 photographs with the highest scores were included in the final set of stimuli. In the Sexual Arousal set photographs showing attractive topless women in different poses were included. The Negative Arousal set consisted of photographs showing, for example, religious sacrifice of animals with blood spilled, halves of cows hanging on slaughterhouse hooks, maggots, or spiders. The no-arousal set of photographs was created out of landscapes showing mountains, forests, and meadows. Participants looked at only one set of photographs. There were 16 men in the No-Arousal group, and 15 in each arousal type group.

After the photographs were shown, the experimenter came back to the room with two manipulation check questions with a 10-point answer scale, asking how sexually excited and stressed participants felt. After completion of the manipulation check questions, participants filled in the WCT, were debriefed and thanked.

Results

First, zero-order correlations were conducted between age and dependent variables: mood before the experiment, post-experiment feeling of sexual excitement, stress/anxiety, and

PA AC and other AC categories. Results showed that categories of AC were not significantly related to each other ($r < .24$, $p > .095$). Physical Aggression AC, but no other category of aggressive cognitions, was related to age ($r = .35$, $p = .017$). Age was not related to mood or stress/anxiety ($r < .09$, $p > .54$), but the effect of age was close to significance for sexual excitation ($r = .27$, $p = .07$). The relation of age to both sexual excitation and PA AC was explored further by conducting Univariate ANOVA, with conditions as the independent variable and age as the dependent variable, to test whether the relation of age to sexual excitation and PA AC might be due to different ages in experimental groups and the mainly higher age in the SA group, leading to spurious correlation of age with sexual excitation and PA AC. Analysis revealed that although, in general, there were no statistically significant differences in age between conditions, $F(2,43) = 2.68$, $p = .08$, participants differed in age between the SA, $M = 23.40$, $SD = 1.45$, and the No-A group, $M = 22.31$, $SD = 1.19$ (the more liberal LSD test instead of Bonferroni was used to trace even small differences, $p = .026$), but there were no differences between No-A and NA, $M = 22.93$, $SD = 1.27$, or between NA and SA. Thus, age was not included in the analysis of the effect of conditions on PA AC and sexual excitation, as including it might lead to biased results.

Next, univariate ANOVA in 3×1 design with conditions: Sexual Arousal, Negative Arousal, and No Arousal as independent variables were repeated for mood, sexual excitation, and stress as dependent variables. There was no significant difference between experimental groups in mood measured before treatment ($F(2,43) = 1.41$, $p = .25$). Further, results showed that the effect of conditions was significant for sexual excitation, $F(2,43) = 39.80$, $p < .001$, $\eta^2 = .81$, and for stress/anxiety, $F(2,43) = 12.93$, $p < .001$, $\eta^2 = .61$. Individuals in the SA condition were more sexually excited than both individuals in the NA, Bonferroni post-hoc, $p < .001$, and No-A condition, $p < .001$, but NA was not different than No-A condition in Sexual Arousal, $p = .611$. As expected, the NA group scored higher than the SA group, $p = .001$, and the No-A group, $p < .001$, in feelings of stress/anxiety. Means and standard deviations of feelings of sexual excitation and stress in each experimental group are presented in Table 2.

Next, the hypothesis assumed that eliciting sexual and negative arousal among participants would be related to a higher level of PA AC, in comparison with the No-A condition. Univariate ANOVA showed that PA AC differed between conditions, $F(2,43) = 4.85$, $p = .013$, $\eta^2 = .43$. Post-hoc Bonferroni tests indicated that significantly higher levels of PA AC were in the NA group than in the No-A group, $p = .015$. Groups with NA and SA conditions did not differ significantly in PA CA, $p = 1.00$, nor did SA and No-A groups differ, $p = .07$, but the probability level was approaching the significance threshold of .05.

Similar analyses performed for Verbal, Relational, and Internal State categories revealed no significant differences due to manipulation ($F > 2.33$, $p > .11$).

Additionally, the mediation analysis using PROCESS by Hayes (Hayes 2013) was conducted to test whether sexual arousal could be responsible for the effect of SA vs. No-A on PA AC. In this analysis, No-A was coded as 0 and SA was coded as 1 and included as predictor of PA AC. Sexual excitation was entered as mediator. Results showed that SA prime influenced PA AC, $R^2 = .14$, $F(1,29) = 4.66$, $B = 0.12$, $SE = 0.05$, $Beta = .37$, $t = 2.16$, $p = .039$, but this effect was substantially decreased when sexual excitation was considered, $R^2 = .29$, $F(2, 28) = 5.61$, $p = .009$, $B = -0.082$, $SE = 0.10$, $t = -.26$, $p = .41$, $r_{\text{partial}} = .15$. The Sobel test showed that the mediation was significant, $B = 0.20$, $SE = 0.08$, $Z = 2.30$, $p = .02$. Excitation was increased by the prime, $R^2 = .73$, $F(1,29) = 78.41$, $B = 5.36$, $SE = 0.60$, $Beta = .85$, $t = 8.85$, $p < .001$, and the more sexually excited participants were, the higher index of PA AC they had, $R^2 = .27$, $F(1,29) = 10.61$, $B = 0.026$, $SE = 0.008$, $Beta = .52$, $t = 3.25$, $p = .003$, controlling for the prime, $B = 0.04$, $SE = 0.01$, $Beta = .74$, $t = 2.40$, $p = .023$. Analysis for stress/anxiety as an SA prime–PA AC relationship mediator was not conducted because SA prime was not a significant predictor of stress/anxiety ($B = 0.44$, $SE = 0.51$, $p = .39$).

Similar analysis was conducted for the Negative Affect prime effect on PA AC, but with the measure of stress/anxiety as a mediator. Participants in the NA group indicated more PA AC than participants in No-A, $R^2 = .29$, $F(1,29) = 12.02$, $B = 0.15$, $SE = 0.04$, $Beta = .54$, $t = 3.46$, $p = .002$. This effect, however, was not mediated by feelings of stress/anxiety, $B = -.009$, $SE = 0.03$, $Z = -0.24$, $p = .80$, although stress/anxiety feelings were positively affected by the prime, $B = 3.11$, $SE = 0.68$, $t = 4.57$, $p < .001$. The effect of the prime remained significant after including the measure of stress/anxiety in the model, $B = .16$, $SE = 0.05$, $t = 2.76$, $p = .01$, $r_{\text{partial}} = .46$. Sexual arousal was not affected by NA prime ($B = 0.82$, $SE = 0.56$, $p = .15$), so mediation analysis for factors including sexual arousal was not conducted for NA prime–PA AC.

Discussion

Participants in Experiment 2 felt more sexually aroused after being presented with erotic images and more stressed and anxious after they had seen photographs that were designed to elicit negative arousal. The key prediction was that exposure to images evoking negative and sexual arousal would increase the PA CA, but this hypothesis was only partially supported. Results showed that the strongest accessibility of physically aggressive thoughts was elicited by negative arousal, and this is in accordance with the negative affect–

Table 2 Means, 95% CI and SD of Sexual Excitation, Stress and indices for Physical Aggression (PA) category of Aggressive Cognitions (AC) in experimental groups. Means for PA AC were corrected for age

	No-A group		SA group		NA group	
	<i>M</i> 95%CI	<i>SD</i>	<i>M</i> 95%CI	<i>SD</i>	<i>M</i> 95%CI	<i>SD</i>
Sexual Excitation	1.43 1.88, 1.98	1.03	6.80 5.59, 8.00	2.17	2.26 1.16, 3.36	1.98
Stress	1.68 1.08, 2.29	1.13	2.13 1.20, 3.06	1.68	4.80 3.44, 6.16	2.45
Physical AC	3.30 2.58, 4.02	1.22	4.16 3.42, 4.90	1.79	4.63 3.90, 5.35	1.19

aggression link postulated by Berkowitz (1990). Quite interestingly, however, the mediation analysis showed that although participants, indeed, reacted to negative affect-inducing stimuli in the predicted manner, namely, indicating more stress/anxiety than those in the No-A condition, the intensity of those feelings did not translate to the PA AC. The scale ranged from 1 to 10, but the mean score for stress/anxiety in the NA condition was less than 5, while the effect of sexual prime for sexual excitation was higher by 2 scale-points. Maybe it was that participants were less fluent in recognizing their anxiety feelings than sexual excitation, or maybe it was more in accordance with men's social role to admit sexual excitation than anxiety/stress, which negatively influenced the accuracy of the stress/anxiety index. Another explanation refers to the problem of complexity of negative emotions. In this study, the index was a 1-item measure. The term "negative" was used to describe the prime, because it well reflected all negative emotions that could be evoked by the presented images. It was not verified whether a particular photograph was related mainly to one specific emotion, but it might be assumed that the same image, e.g., halves of cows hanging on slaughterhouse hooks, might have evoked disgust, sadness, anxiety, or anger, depending on the individual's characteristics. What followed, the measure of stress/anxiety, was affected by the NA prime, but the one-item measure was not enough to depict the whole array of negative emotions present after watching the photographs and thus was not sufficient to mediate the effect of the prime on PA AC. It is possible that other negative emotions or a mixture of negative emotions, which were not measured, mediated the effect.

It was also predicted that sexually aroused participants would differ in the number of aggressive word stems when compared with the control group. The difference was not significant: only small differences approaching significance were detected. One possible explanation is that the erotic stimuli in this experiment were too mild to trigger aggressive cognitions strongly. There are some studies showing that nudity and mildly erotic words may even decrease aggression, whereas violent pornography has the strongest effect in triggering aggression (Allen et al. 1995). It is also possible that not everyone is susceptible to the sex-aggressive cognitions link. The

effect of exposure to erotic images on aggressive cognitions may vary depending on individual characteristics that have not been included in this study, such as for example sexual narcissism (Imhoff et al. 2013) or past pornography consumption (Hald and Malamuth 2015). Such individual characteristics might have translated to different intensity levels of sexual excitation among participants. The mediation analysis showed that, the more sexually excited participants were after the SA prime, the more often they completed the PA category words in an aggressive manner. The whole effect of the sexual prime was mediated by the sexual arousal, which indicates the powerful role of individual differences related to personality characteristics, but also to sexual stimuli preferences in the sex prime-aggressive cognitions effect.

Both Experiments 1 and 2 demonstrated that masculinity threat and negative arousal activate physically aggressive cognitions among males. In line with the hypotheses, other categories of aggressive words were not successfully primed, regardless of the experimental procedure. It suggests that, in the case of males, physical aggression at the cognitive and behavioral levels is the core construct in the associative network of the aggression concept, and that a spreading effect on associated paths representing relational aggression, verbal aggression, and internal states does not occur.

Thus, searching for the possibility to activate responses other than physically aggressive thoughts, Experiment 3 was conducted on an exclusively female sample, and the experimental procedure used the prime that is not as sex-typed as the masculinity threat or the sexual arousal condition. Considering well-proven empirical evidence that females are less physically aggressive than males (Archer 2004), it was expected that priming would also have an effect on other categories of the "aggression" concept besides physical aggression.

Experiment 3

Overview and Hypothesis

In experiment 3, the "aggression" concept was activated using the Aggression Questionnaire (AQ) (Buss and Perry 1992).

The prediction was that female participants who filled in the AQ would have more aggressive cognitions accessible when compared with the control group. The reasoning was that reading and responding to Aggression Questionnaire items, similar to listening to violent lyrics or reading aggressive words (Anderson et al. 1998; Anderson et al. 2003), should prime and increase the accessibility of aggressive words. However, the AQ includes items related not only to physical aggression but also to verbal aggression, anger, and hostility. Therefore, when these different categories are stimulated, physically aggressive cognitions alone should not be activated, and not necessarily at all, especially when female participants are included into the study. Physical aggression is a risky form of aggressive behavior for females (Björkqvist 1994; Campbell 2006). Moreover, it has consequences for a victim that are easy for a perpetrator to observe, a factor which can diminish female direct aggression. The magnitude of the sex differences in aggression decreases significantly when aggression results in a less visible actor's suffering (Eagly and Steffen 1986), which is characteristic for relational and verbal aggression. Further, adolescent girls evaluate aggression as being more harmful than boys (Coyne et al. 2006), whereas women perceive the same act of direct aggression as being more aggressive than men (Frodi et al. 1977). From this point of view, the effect of aggression priming should not appear for physically aggressive cognitions, but rather for the relational and verbal subscales of the WCT. However, even if physically aggressive behavior is rejected by females, physically aggressive cognitions might be evoked in the first instance if physical aggression is also a prototype of the "aggression" concept for females. Although perpetrators of physically aggressive acts are predominantly males, one does not inevitably need to manifest aggression whenever one has physically aggressive thoughts. To which extent females' physical aggression is easily activated at the cognitive level without follow-up at the behavioral level is one of the questions addressed in Experiment 3.

Method

Participants

Data for study 3 were collected from 95 undergraduate students of education, all women. The ages of participants ranged from 18 to 24 years ($M = 20.48$; $SD = 1.73$). All participants were Caucasian. Participants did not receive any financial or other compensation for participation in the study.

Materials and Procedure

The whole procedure was performed during classes in relatively small groups of 30 participants. Participants were

informed that they were taking part in a study aimed at constructing a new research tool called Test of Language Skills (TLS). They were informed that TLS serves primarily to test their linguistic skills and cognitive functioning. Participants in an experimental condition were asked to fill out an Aggression Questionnaire before starting the TLS ($n = 53$). The Aggression Questionnaire (Buss and Perry 1992) consists of 29 items relating to behaviors and feelings concerning aggression. Two subscales of AQ relate to overt manifestations of aggression—Physical Aggression and Verbal Aggression—while the two remaining subscales concern "internal states": Anger and Hostility. The first task of participants in the control group was to complete TLS ($n = 42$). After completion of TLS they also filled out other questionnaires which were not the subject of analysis in the study.

Results

The ANOVA and regression analysis were preceded by zero-order correlations analyses. Results showed that AC categories were not associated with each other (the highest, but insignificant, correlation was observed for State AC and Verbal AC, $r = -.18$, $p = .08$, and the lowest between State and Physical Aggression AC, $r = .02$, $p = .81$), so instead of a multivariate analysis of variance, a t-test for each category of AC was conducted. Also, a correlation analysis showed that age was not associated with any of the AC categories (r was between $-.18$, $p = .08$, for PA and $.04$, $p = .69$, for the Verbal category).

To test whether the Aggression Questionnaire prime affected AC, a series of t-tests was conducted with 2×1 design for all AC categories as dependent variables and experimental conditions (completing the AQ before TLS, coded 1; control—not completing AQ before TLS—coded 0) as independent variable. Results showed that the effect of the condition was observed only for PA AC ($F(1,93) = -2.27$, $p = .025$, $d = .47$). A higher PA AC index was observed in the AQ group ($M = 4.35$, $SD = 1.49$, 95% CI [3.94, 4.77]) than in the control group ($M = 3.66$, $SD = 1.46$, 95% CI [3.20, 4.11]). The differences in mean Relational, Verbal, and Internal State AC were not significant, with $t < 1.28$ and $p > .20$.

Additionally, it was tested whether AQ score was related to any AC category, but there was no significant correlation, $r < .17$, $p > .22$.

Discussion

Female participants who filled in the Aggression Questionnaire generated more aggressive words than participants in the neutral condition but, surprisingly, the difference was statistically significant only with regard to physical

aggression. Completion of a self-report questionnaire about one's own aggressive feelings, thoughts, and behaviors did not activate other kinds of aggressive cognitions. One could predict that, since the AQ includes verbal aggression, anger, and hostility dimensions, giving responses to the questionnaire's items should also be reflected in higher accessibility of words related to verbal aggression and internal states. The results suggest that other aggressive constructs than those related to physical aggression are less schematic to "aggression" as a general concept, even for females. Thus, when aggressive cognition is considered, sex differences—at least those regarding the frequency of thoughts about hitting or killing somebody—disappear. Although females try to inhibit their physical aggression (Campbell 2006) and perceive aggression as harmful and dysfunctional due to holding expressive beliefs about aggression (Campbell and Muncer 2008), they maintain physical aggression as the core of the associative network related to aggression concepts, just as men do. However, it remains an open question how it happens that, in spite of activating physically aggressive cognitions, females externalize aggression primarily in indirect ways, as opposed to males, who show consistency with regard to physically aggressive cognitions and behaviors.

General Discussion

The primary aim of the current studies was to test the priming effect on four distinct categories of aggressive cognitions using different experimental procedures with sex-typed and neutral primes. According to cognitive-neoassociationistic model of aggression (Berkowitz 1990, 1993), activation of one aggressive concept is spread to other associated concepts. From this point of view, the effect of aggression priming, regardless of type of the prime, should appear in all types of aggressive cognitions. On the other hand, aggression in general is a strongly sex-typed behavior, with males exhibiting mostly physically aggressive acts and females being rather inhibited when it comes to overt aggression (Archer 2004; Campbell 2006). Thus, one might assume that sex differences in aggression would be reflected in sex-typed aggressive cognitions. However, these three studies reveal that, when the concept "aggression" is activated, the accessibility of physically aggressive thoughts increases regardless of the participant's sex or the sorts of stimuli used to evoke aggressive cognitions. Neither thoughts related to verbal and relational aggression nor anger and hostility-fueled cognition were successfully activated. One possible explanation of the results obtained consistently in the three experiments is that physical aggression is a prototype of an aggressive cognition network that is easily activated without the spreading effect on the associated constructs and rarely manifested, at least in a normative sample. Thus, cognitive accessibility of physical

aggression might be transformed into such forms of aggressive acts which are more acceptable regarding social norms, e.g., verbal or relational aggression. To test this hypothesis, in future research participants should be primed with different words or other stimuli representing a wide range of subtypes of aggression. Then, once aggressive cognitions have been activated, the participant should select from various forms of aggression available as dependent variables. The whole procedure will give in-depth understanding of the link between a sort of stimulus and a certain type of aggressive behavior with the mediating function of aggressive cognitions related to physical, verbal, and relational aggression, as well as internal states. Regarding physical aggression as the prototype of an aggressive cognition network is a tempting conclusion derived from the results of these three experiments, but one should also keep in mind that the number of physically aggressive words included in the WCT (more than words from other categories) could make a difference, and so further research is needed.

It must be acknowledged that there are some important critical points related to priming research which might also be relevant in our studies. In the face of failures in replicating some of the most important social priming studies (e.g., Doyen et al. 2012; Pashler et al. 2012), several issues appeared important; for example, the role of participants' awareness that the prime affects the subsequent response, or the role of experimenter expectations (Doyen et al. 2012; Doyen et al. 2014). In study 3, participants might have realized while filling in the WCT that it could have some relationship with the prior filling in of the Aggression Questionnaire, since both dealt with the aggression concept.

The issue touched on in the previous paragraph is also related to the topic of the aggressive cognition–aggressive behavior relationship as a crucial aspect for future studies. Although the results showed that priming with aggressive cues increases the accessibility of physically aggressive thoughts, it is still a question to what extent the final result of this sequence is aggressive behavior. Theoretically, the effect of the specific cognitions on aggressive behaviors is well-grounded in GAM (Anderson and Bushman 2002) and explained in detail by the social information processing model (Dodge and Schwartz 1997). Empirically, the magnitude of the impact of cognition on aggressive behavior is discussed and criticized by Ferguson and Dyck (2012), who point out that cognitive access to aggressive cognition is not equivalent to boosting aggressive intents and behavior.

A further issue that needs to be considered in the context of the cognition–aggression relation concerns the individual features that make some people more susceptible to the effects of "aggression" activation than others. Obviously, those individuals who have well elaborated knowledge about aggression and more interconnected associations between aggressive cognitions generate the aggressive response easier and faster

compared to low-aggression individuals. The study by Bushman (1996) confirmed this prediction, but the opposite effect has also been reported. Meier and colleagues (Meier et al. 2007) showed that aggressive priming activated hostile cognitions but only among individuals who scored low on trait aggression. Unfortunately, in Experiment 3 the AQ was used only as a prime and not as a moderator of the priming effect, but correlational analyses showed that the trait aggression score was not related to AC. One could predict that people who self-report more aggressive tendencies should react with more aggressive word completions than those who see themselves as less aggressive. Trait aggressiveness is related to aggressive behavior (Archer and Webb 2006), but apparently aggressiveness is not inevitably associated with aggressive cognitions, and aggressive cognitions are not necessarily related to aggressive behavior.

Likewise, masculine males should be expected to possess detailed knowledge about stereotypic masculine traits (Markus et al. 1982) that made them more susceptible to masculinity threat. In previous studies, both masculinity and gender group identification predicted aggression after gender threat (Babl 1979; Maass et al. 2003), but **Experiment 1** showed no moderating effect of masculinity threat on aggressive cognitions. One possible explanation is that activation of the some concept in semantic memory can produce not only assimilation, but also inhibition effects (Newman and Uleman 1990). Moreover, permanent and high accessibility to aggression knowledge may lessen the sensitivity to situational priming of aggression. As the result shows, only those who are low on the particular dimension related to aggression react when this concept is activated (Meier et al. 2007). Also, the question remains, to what extent aggression is a part of the masculinity schema, especially in a normative sample in which aggression is regarded as socially unacceptable.

Although the results of these conducted studies were generally in line with the hypotheses, they should be nevertheless treated with caution due to the relatively small number of participants. The post-hoc power tests indicated that, while power in studies 1 and 2 was close, although slightly lower than adequate .80, the power in study 3 was not as expected. However, although the power of all three studies was lower than recommended, the samples were sufficient to show significant results at least for PA CA, with effects of small to average size. Moreover, the main effect and effect size for PA AC were repeated in all three studies, so it could be considered reliable, keeping in mind that higher numbers of participants give more statistical power and less chance for Type II error.

Conclusions

Studies based on cognitive-neoassociationistic theory conducted so far have indicated the effect of the priming

aggression construct on aggressive cognitions using different priming procedures and aggressive cognition measurement. These three studies used different priming procedures but the same measurement of aggressive cognitions, namely the Word Completion Task, which contained not only association with physical aggression, as in previous research, but also with other forms of aggressions: verbal, relational, and emotional or affective. The results showed that masculinity threat, negative arousal, and induction of thinking about one's own aggressive behavior were all followed by changes in aggressive cognitions. However, higher frequency of aggressive thoughts after priming was associated only with physical aggression and no other forms of aggression. The obtained results may highlight the prominent and probably prototypical role of physical aggression in the aggressive cognition network. Although the study showed a consistent link between very different, less and more direct aggression priming situations and aggressive cognitions, questions still remain to be explored of how much of the effect is transferred to actual aggressive behavior, how long the activation lasts, and whether frequent activation may lead to aggressive personality formation.

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Compliance with Ethical Standards

Conflict of Interest Author A declares that she has no conflict of interest. Author B declares that she has no conflict of interest. Author C declares that she has no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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