



## Can 'risky' impulsivity explain sex differences in aggression?

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### ABSTRACT

Impulsivity is a heterogeneous concept and sex differences are most apparent on those inventories that sample involvement in risky behaviours. However these instruments often fail to emphasise the 'impulsive' component of risky action. Exploratory and confirmatory factor analyses were used to develop a 12-item scale of risky impulsivity. To examine its construct validity, the Zuckerman–Kuhlman impulsive sensation seeking scale was used. Self-reported aggression (physical and verbal) and angry behaviours (explosive and defusing) were also measured. Although risky impulsivity correlated with both of the two Z–K facets (Impulsivity and sensation seeking), it showed a stronger correlation than either of them with physical and verbal aggression. Sex differences in physical and verbal aggression were completely eliminated (and the sex difference in Explosive Anger was significantly decreased) when risky impulsivity was controlled. The risky impulsivity instrument appears very suitable for examining that form of impulsivity most relevant to aggression.

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### 1. Introduction

Impulsivity has been strongly implicated in aggression and externalising disorders (Fox, Henderson, Marshall, Nichols, & Ghera, 2005) and the relationship is as strong for females as for males (Cale, 2006). Sex differences are reliably found in aggressive behaviour, with the magnitude of the effect size increasing in line with the dangerousness of the form of aggression (Archer, 2004). In light of the conspicuous absence of sex differences in anger (Archer, 2004), it seems reasonable to propose that males' greater aggression may result from their higher levels of 'risky' impulsivity (Campbell, 2006).

Although 'impulsivity' is broadly understood to refer to 'a tendency to act spontaneously and without deliberation' (Carver, 2005, p. 313), the existence and magnitude of sex differences in impulsivity seems to depend upon the measurement instrument used. Many impulsivity inventories pose general statements about impulsive behaviour where no explicit danger is implied. Examples include *Are you an impulsive person?* (I<sub>7</sub> Impulsiveness, Eysenck, Pearson, Easting, & Allsopp, 1985), *I have trouble resisting my cravings* (NEO personality inventory-revised: impulsiveness, Costa & McCrae, 1992) and *I act on the spur of the moment* (Barratt impulsiveness scale-11, Barratt, 1994). These inventories tend to produce weak, inconsistent or null sex differences (e.g. Costa, Terracciano, & McCrae, 2003; Feingold, 1994). Other impulsivity inventories incorporate items which carry an element of risk or danger, such as Eysenck I<sub>7</sub> Venturesomeness (Eysenck et al., 1985), NEO PI-R: Excitement Seeking (Costa et al., 2003), sensation seeking scale

(Zuckerman, 1994), and MPQ harm avoidance reversed (Moffitt, Caspi, Rutter, & Silva, 2001). Here sex differences are apparent.

These sex differences may derive from the well-established sex difference in fear of harm or injury (Campbell, 1999, 2006). In childhood, girls are more fearful than boys (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006). In adults, physiological studies (McManis, Bradley, Berg, Cuthbert, & Lang, 2001) and international surveys (Brebner, 2003) find that women experience more frequent and intense fear than men. Women make less risky decisions than men, especially when the risks are physical or life-threatening (Byrnes, Miller, & Schafer, 1999). Most relevant to the present argument, fear moderates the sex difference in aggression. Sex differences in aggression are larger to the extent that women rate the situation as more dangerous than men (Bettencourt & Miller, 1996; Eagly & Steffen, 1986). Fear, by triggering freezing or flight in threatening situations, restrains impulsive action (Fox et al., 2005).

Sensation seeking scales explicitly address risky situations and sex differences are reliably found. But is sensation-seeking really a form of impulsivity or does it reflect a distinct trait? At an empirical level, Whiteside and Lynam's factor analysis of 21 impulsivity scales found sensation seeking to be an orthogonal factor but Gerbing, Ahadi, and Patton's (1987) factor analysis of 373 impulsivity items reported a correlation of .52 between thrill seeking and impulsivity factors. Zuckerman (1994) argued that sensation seeking implicitly incorporates a "willingness to take physical and social risks". However parachute jumpers do not jump from planes on impulse; they plan carefully and check their equipment, drop site, parachute and timings. Although the Zuckerman–Kuhlman impulsive sensation seeking scale (Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993; Zuckerman & Kuhlman, n.d.) attempts to blend the constructs of impulsivity and sensation seeking, it nonetheless

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contains two distinct item populations: Sensation Seeking items emphasising risk but not spontaneity (*I like to have new and exciting experiences and sensations even if they are a little frightening*) and Impulsivity items emphasising spontaneity but not riskiness (*I am an impulsive person*). When factor analysed, the scale items split into these two components. Thus it is unclear whether the overall sex difference on this scale (Aluja, Garcia, & Garcia, 2003; Hojat & Zuckerman, 2008; Zuckerman & Kuhlman, 2000) is attributable to the impulsivity, sensation seeking or both.

Women's desistance from aggression may reflect behavioural inhibition under risky conditions, rather than a lower level of general impulsivity. To examine this, we aim to construct an inventory of risky acts with the items worded to incorporate a clear element of impulsivity. We can then examine sex differences and their potential to mediate sex differences in aggression.

Meta-analyses have confirmed robust sex differences in direct physical and verbal aggression in laboratory (Bettencourt & Miller, 1996) and real world studies (Archer, 2004). However, anger is frequently discharged without recourse to aggression (defined as 'an intent to harm or injure', Baron, 1977). Such non-injurious angry actions have been measured and factorially confirmed as explosive and defusing acts (Campbell & Muncer, 2008). 'Explosive' actions are those in which there is an acute, high-energy behavioural discharge of anger in the absence of the provoker. The four-item measure of Explosive acts includes (when alone) hitting walls, throwing inanimate objects, destroying property, and screaming abuse. 'Defusing' actions involve attempts to reduce the intensity of the aggression-precipitating angry emotion. Defusing items include retreating from the scene to calm down, discussing the incident with a third party, giving the offender the silent treatment and crying. Explosive and defusing acts are a safer strategic option than direct aggression, being unlikely to provoke physical retaliation. We therefore predict that risky impulsivity will be positively related to verbal and physical aggression (but not to explosive or defusing acts) and that sex differences in physical and verbal aggression will be mediated by risky impulsivity.

## 2. Method

### 2.1. Sample 1

#### 2.1.1. Participants

Participants were 329 undergraduate students aged 18–24 at a northern British university. This opportunity sample was composed of 165 men and 164 women who were studying subjects other than psychology.

#### 2.1.2. Instruments

Candidate items for the impulsivity inventory were initially developed from focus group discussions (5 groups of 6 student participants) who described occasions, during the prior week, where they had acted impulsively. Impulsivity was not formally defined, as the aim was to access lay people's own perceptions and experiences. Following this, synonymous items were merged, contextual details were deleted to achieve greater generality and items referring to aggressive acts were removed to eliminate content overlap with the aggression questionnaire. This resulted in 30 behavioural items (see Table 1), each prefaced by the lead statement "On impulse I would...". Respondents rated the probability of impulsively engaging in each act on a Likert scale from Very unlikely (1) to Very likely (5). One global self-descriptive item was added: "In general, I avoid impulsive actions if I might get injured" to assist in interpreting the factors resulting from the factor analysis.

The angry behaviour questionnaire (Campbell & Muncer, 2008) was also distributed. The 16-item questionnaire taps four expres-

**Table 1**

Item loadings Factors 1 and 2.

Item ("On impulse I would ...")	Factor 1	Factor 2
<b>9. Have a one night stand with an attractive stranger</b>	<b>.65</b>	-.30
<b>26. Tear up a parking ticket</b>	<b>.65</b>	-.05
<b>22. Have unprotected sex</b>	<b>.62</b>	-.14
<b>4. Smoke cannabis if someone offered it to me</b>	<b>.61</b>	-.05
7. Make a gesture at an inconsiderate driver	.61	-.11
<b>14. Gamble more money than I actually have</b>	<b>.60</b>	-.08
<b>23. Drive too fast when I am feeling upset</b>	<b>.59</b>	.06
25. Skip a lecture because I am not in the mood	.58	.09
<b>29. Turn right across oncoming traffic with only just enough time to make it</b>	<b>.58</b>	-.09
<b>8. Have another drink even when I am already drunk</b>	<b>.55</b>	.05
15. 'Streak' at a public event, just for a laugh	.54	-.21
5. Make the first move to kiss someone I find attractive	.53	-.21
<b>24. Put purchases on a credit card without having enough money to pay it off</b>	<b>.53</b>	.28
<b>2. Drive through an amber traffic light</b>	<b>.50</b>	.01
<b>17. Run across a road to beat the oncoming traffic if I am in a hurry</b>	<b>.47</b>	-.08
27. Walk out of a restaurant because the service is too slow	.46	.12
<b>6. Steal something from a shop</b>	<b>.43</b>	-.09
16. Go up to a stranger and begin a conversation if I find them attractive	.45	-.07
30. Walk away from someone who is annoying me	.47	-.04
18. Book a 'last-minute' foreign holiday	.47	.16
<b>28. Buy an item of clothing that I like even if I don't need it</b>	<b>.18</b>	<b>.70</b>
<b>11. Go into an expensive shop just because I am walking past</b>	<b>.21</b>	<b>.68</b>
<b>1. Buy a 'treat' to cheer myself up</b>	<b>.10</b>	<b>.66</b>
<b>13. 'Binge' eat my favourite food</b>	<b>.20</b>	<b>.56</b>
<b>21. Hug someone out of happiness</b>	<b>-.10</b>	<b>.53</b>
<b>12. Blur something out without thinking</b>	<b>.22</b>	<b>.44</b>
10. Hang up the phone on an unsolicited sales call	.39	.04
3. Cancel my plans and go for a drink if I unexpectedly met an old friend	.30	.14
19. Get on a really scary ride at a funfair	.36	-.18
20. Say something to someone that I later regret	.30	.20
31. "In general, I avoid impulsive actions if I might get injured" (diagnostic item)	-.32	.32
Variance explained %	21.92	8.89

Note. Items in bold were retained on the final scales.

sions of anger; physical aggression, verbal aggression, explosive acts and defusing acts. Each scale has four items. Respondents rated their probability of engaging in each behaviour when angry on a Likert scale from Very unlikely (1) to Very likely (5).

### 2.2. Sample 2

#### 2.2.1. Participants

Participants were 356 undergraduate students aged 18–24 at a northern British university. This opportunity sample was composed of 174 men and 182 women, studying subjects other than psychology.

#### 2.2.2. Instruments

Participants completed the 30-item impulsivity scale and the angry behaviour questionnaire as described for Sample 1. In addition, they completed the 19-item impulsive sensation seeking scale from the Zuckerman–Kuhlman personality inventory (Zuckerman & Kuhlman, n.d.; Zuckerman et al., 1993). Eight of the items assess impulsivity and 11 assess sensation seeking. The questionnaires were distributed and completed as for Sample 1.

## 3. Results

### 3.1. Exploratory factor analysis

Exploratory factor analysis of the 31 candidate items for the Risky impulsivity scale was performed on the Sample 1 data. Bartlett's

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