

Sensation Seeking or Empathy? Physically Aggressive and Non-Aggressive Antisocial Behaviors (ASBs) Amongst University Students

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Abstract

Previous research has linked anti-social behavior (ASB) to subtypes of empathy and also to sensation seeking, but there is limited research on the relative roles of empathy subtypes and sensation seeking traits in predicting ASB subtypes. The current study therefore investigated the relationship between sensation seeking, the three subtypes of empathy (emotional reactivity, cognitive empathy and social skills) and the two subtypes of ASB (physically aggressive and non-aggressive). An online survey consisting of Demographic Variables Questionnaire, Brief Sensation Seeking Scale, Empathy Quotient and the Antisocial Behavior Measure was sent to student volunteers, leading to a total of 537 respondents. Empathy alone accounted for a relatively modest proportion of the total variance in the ASBs, with emotional reactivity being the only significant predictor. Adding sensation seeking to the regression led to a marked improvement in prediction for non-aggressive ASB and a slight but significant improvement for physically aggressive ASB. Sensation seeking, emotional reactivity and social skills (but not cognitive empathy) contributed unique variance for both ASB subtypes. The greatest variance for physically aggressive and non-aggressive ASB were accounted for by emotional reactivity and sensation seeking, respectively. The results indicate that both sensation seeking and sub-types of empathy are important in predicting ASBs. This has theoretical implications for different personality models and has practical implications for the development of preventive measures to avoid such behaviors.

Keywords: Antisocial behavior (ASB), conduct disorders, emotional reactivity, cognitive empathy, sensation seeking, assault, physically aggressive.

Introduction

Antisocial behavior (ASB) refers to violation of age appropriate norms (American Psychiatric Association, 2000). Antisocial behavior subtypes (ASBs) create disruption in societies worldwide (UNODC, 2015). The ASB subtypes used as criterion variables in this study are derived from the classification of conduct disorders in the Diagnostic and Statistical Manual of Mental disorders (DSM-IV-TR; American Psychiatric Association, 2000; Rowe, Maughan, Worthman, Costello, & Angold, 2004). The conduct disorders/ASBs in the DSM-IV-TR are classified into four subtypes which are 1-Aggression to people and animals, 2- Destruction of property, 3- Deceitfulness or theft, and 4- Serious violation of rules. They have been categorized as physically aggressive (actual or threatened ASB towards living beings such as hitting or threatening to cause physical harm, i.e. 1-Aggression to people and animals in the DSM-IV-TR), and non-aggressive behaviors (actual or threatened ASB towards others' property such as stealing or setting fire to others' property, and verbal attacks such as being rowdy in the public; i.e. 2- Destruction of property, 3- Deceitfulness or theft, and 4- Serious violation of rules in the DSM-IV-TR).

Certain socio-affective personality traits might help in predicting physically aggressive and non-aggressive ASBs. The current research examined the role of three subtypes of empathy i.e. emotional reactivity, cognitive empathy and social skills, and sensation seeking in predicting the two ASB subtypes. Empathy and sensation seeking are two opposing socio-affective traits or emotions. Empathy is an other-oriented emotion involving understanding of others' emotions, thoughts and appropriately responding to them (e.g. Beadle, 2009; Menegazzo, Cruz-Ortiz, Ortega-Maldonado, & Salanova, 2015; Roeser & Eccles, 2015; Romero-Canyas & Downey, 2013; Thompson & Gullone, 2008). In contrast, sensation seeking is a self-oriented pleasurable emotion that only benefits oneself (e.g. Azaiez, Alajjouri, Lahmar, & Chalhaf, 2014; Charnigo et al., 2013; Goossens, 2000; Janson, 1993). Sensation seeking may often be an antisocial emotion (e.g. Nower, Derevensky, & Gupta, 2004).

There is limited research to indicate the normal functioning of emotions amongst youth with respect to relative effects of sensation seeking versus empathetic emotions in predicting ASBs (Santesso & Segalowitz, 2009). Individuals who engage in high levels of ASB might also demonstrate high levels of sensation seeking and intact empathy (Martin, Smith, & Quirk, 2015). The literature does not indicate the relative effects of sensation seeking and subtypes of empathy in predicting physically aggressive and non-aggressive ASBs. We conducted this research to find out the relative effects of self-oriented emotions in the form of sensation seeking versus other-oriented emotions in the form of empathy subtypes in predicting ASBs amongst normal educated youth.

Previous researchers have shown a positive relationship between sensation seeking and physically aggressive ASBs (e.g. Cui, Colasante, Malti, Ribeaud, & Eisner, 2015; Dahlen, Martin, Ragan, & Kuhlman, 2004, 2005; Kamaluddin, Shariff, Othman, Ismail, & Mat Saat, 2015; Shukla, & Pradhan, 2015), as well as a positive relationship between sensation seeking and non-aggressive ASBs (e.g. Ball, Carroll, & Rounsaville, 1994; Carrasco, Barker, Tremblay, & Vitaro, 2006; Harden et. al., 2015; Sijtsema, Veenstra, Lindenberg, van Roon, Verhulst, Ormel, & Riese, 2010; Xu, Raine, Yu, & Krieg, 2014). The main element of sensation seeking is risk taking (Zheng, Tan, Xu, Chang, Zhang, & Shen, 2015) regardless of whether it is associated with non-aggressive ASBs such as

gambling, and cyberbullying (e.g. Kokkinos, Antoniadou, & Markos, 2014), or physically aggressive ASBs such as sexual impulsivity, injury in sports, and drug abuse (e.g. Reid, Berlin, & Kingston, 2015; Shukla & Pradhan, 2015). Thus, it is not clear whether sensation seeking is more likely to predict physically aggressive ASBs or non-aggressive ASBs. Sensation seeking is a typical marker of adolescence (Shulman, Harden, Chein, & Steinberg, 2015) and is inversely related to subtypes of empathy such as emotional reactivity, cognitive empathy and social skills subtypes of empathy (Kokkinos et al., 2014; Silmere, 2008). However, in some researches (e.g. Beyers, Toumbourou, Catalano, Arthur, & Hawkins, 2004; Rezayi, 2014), sensation seeking was positively related to empathy.

There are different subtypes of empathy (Lawrence, Shaw, Baker, Baron-Cohen, & David, 2004). The present study used three subtypes of empathy as predictors. These were emotional reactivity, cognitive empathy and social skills (Lawrence et al., 2004). Emotional reactivity refers to emotional reaction in response to other people's emotions, such as others' joy or distress. Cognitive empathy refers to understanding others' thoughts, and awareness of others' state of mind. Social skills refer to understanding and managing social situations, for example understanding social expectations or dealing with relationships (e.g. Bons et al., 2013; Lawrence et al., 2004).

The correlation between empathy and ASBs might differ depending upon the subtypes, definitions, and levels of empathy and ASBs of the participants (e.g. Feilhauer & Cima, 2013; Jones, Happé, Gilbert, Burnett, & Viding, 2010). Most studies (e.g. Kokkinos et al., 2014; Taubner, White, Zimmermann, Fonagy, & Nolte, 2013; Ttofi, Bowes, Farrington, & Lösel, 2014) have found an inverse relationship between the subtypes of empathy and the subtypes of ASBs.

Previous researchers have considered the relationship of affective/emotional and cognitive empathy subtypes to physically aggressive and non-aggressive ASBs (e.g. Brockmyer, 2015; Jolliffe & Farrington, 2004; Lunsford, 2014; van Langen, Wissink, van Vugt, Van der Stouwe, & Stams, 2014; Viding, Simmonds, Petrides, & Frederickson, 2009; Yeo, Ang, Loh, Fu, & Karre, 2011). They have found that emotional reactivity is more likely to inversely predict physically aggressive ASBs while cognitive empathy and social skills are more likely to inversely predict non-aggressive ASBs such as cyberbullying, an indirect form of aggression (e.g. Espelage, Rose, & Polanin, 2015; Schultze-Krumbholz & Scheithauer, 2015; Yeo et al., 2011). Although low social skills are associated with ASBs (e.g. Buck, 2013; Ttofi et al., 2014) and problematic behaviours (e.g. Qi & Kaiser, 2003), some studies (e.g. Carpenter, & Nangle, 2006) also contradict the inverse relationship between social skills and subtypes of ASBs. There is limited evidence regarding the correlation of social skills to physically aggressive and non-aggressive ASBs.

The relationship between cognitive empathy and ASBs (e.g. Almeida, Seixas, Ferreira-Santos, Vieira, Paiva et. al., 2015; Jolliffe & Farrington, 2004; van Leeuwen, Rodgers, Gibbs, & Chabrol, 2014), emotional empathy/emotional reactivity and ASBs (e.g. Dadds et al., 2009; Domes, Hollerbach, Vohs, Mokros, & Habermeyer, 2013; Hosker-Field, 2011; Milojević & Dimitrijevic, 2014; van Heerebeek, 2010), and social skills and ASBs (e.g. Carpenter, & Nangle, 2006) has been inconsistent. Low social skills are more likely to predict non-aggressive ASBs but they have been inversely related to both subtypes of ASBs (e.g. Ttofi et al., 2014). Literature has

shown mixed results (e.g. Ang & Goh, 2010; Lonigro, Laghi, Baiocco, & Baumgartner, 2013; Mayberry & Espelage, 2007) regarding the relationship between subtypes of empathy and subtypes of ASBs, so it is not clear which subtypes of empathy predict which subtypes of ASBs.

A recent study (McTernan, Love, & Rettinger, 2014) showed that cognitive empathy and sensation seeking personality traits were differentially related to the subtypes of ASBs. Low cognitive empathy was more likely to predict non-aggressive ASB, while high sensation seeking and emotional reactivity were more likely to predict physically aggressive ASB. Unfortunately, the authors (McTernan et al., 2014) used a different definition for emotional reactivity, physically aggressive and non-aggressive ASBs than that used in the current study. They have mentioned ASBs in terms of different cheating behaviors. Emotional reactivity has been used for the term impulsivity. Physically aggressive ASB have been defined in terms of relationship cheating and cheating in sports whereby the victim is known and it is direct form of transgressive behavior. Non-aggressive ASB have been defined in terms of social contract violations, which involve rule-breaking ASB, and the victim is not obvious and thus is an indirect transgressive behavior. Given that sensation seeking and the sub-types of empathy separately predict sub-types of ASB, and that sensation seeking correlates negatively with the subtypes of empathy it is therefore important to undertake a programmatic analysis of their relative contributions to the sub-types of ASB.

It is difficult to assume, whether sensation seeking or empathy would be the strongest predictor of ASBs as well as which subtype of empathy would be strongest predictor of which subtype of ASB. Since most of the research (e.g. Aaltola, 2013; de Kemp, Overbeek, de Wied, Engels, & Scholte, 2007; Eisenberg, Eggum, & Di Giunta, 2010; Jolliffe & Farrington, 2006, 2007, 2011; Maurage et al., 2011; Shechtman, 2002) shows lack of emotional empathy in relation to ASBs, we might expect that low emotional reactivity would be the strongest predictor of both physically aggressive and non-aggressive ASBs. Since sensation seeking is inversely related to empathy (Kokkinos et al., 2014) high sensation seeking might also emerge as one of the strongest predictors of both physically aggressive and non-aggressive ASBs.

Therefore, the present research examined the relative strengths of the subtypes of empathy and sensation seeking in predicting physically aggressive and non-aggressive ASBs. The role of demographic variables in relation to sensation seeking and subtypes of empathy was also observed. In this context, male students are likely to engage in greater ASBs (e.g. Bachman, Dillaway, & Lachs, 1998; Eme, 2013; Nansel, Overpeck, Pilla, Ruan, Simons-Morton, & Scheidt, 2001), particularly physically aggressive ASBs (Demissie, Asfaw, Abebe, & Kiros, 2015; Chung-Do, Goebert, Hamagani, Chang, & Hishinuma, 2015; Ibabe & Bentler, 2015), high sensation seeking and low empathy (e.g. Berg et al., 2015; Ball, Farnill, & Wangeman, 1984; Shulman et al., 2015)

Students belonging to the same culture are likely to display more empathy as compared to foreign students (e.g. Rosenthal, Russell, & Thomson, 2007).

Aims of this study

The first aim of the current study was to examine the correlations between the subtypes of empathy (i.e., emotional reactivity, cognitive empathy and social skills), sensation seeking and physically aggressive and non-aggressive ASBs while controlling for age amongst university students. The second aim was to find out if emotional reactivity predicted physically aggressive ASBs while cognitive empathy and social skills predicted non-aggressive ASBs (American Psychiatric Association, 2000; Rowe et al., 2004). The third aim was to examine the hierarchy of sensation seeking (Zuckerman, Eysenck, & Eysenck, 1978) along with subtypes of empathy in predicting subtypes of ASBs. The fourth aim was to determine the competitive effects of these socio-affective personality traits in predicting ASB subtypes. The hypotheses are described below.

H₁: Cognitive empathy, emotional reactivity and social skills would be inversely and sensation seeking would be positively related to physically aggressive and non-aggressive ASBs. **H₂:** Low emotional reactivity would predict physically aggressive ASBs while low cognitive empathy and social skills would predict non-aggressive ASBs. **H₃:** High sensation seeking and low emotional reactivity would predict physically aggressive ASBs while high sensation seeking and low cognitive empathy would predict non-aggressive ASBs. **H₄:** Low emotional reactivity and high sensation seeking would be the most significant predictors of physically aggressive non-aggressive ASBs.

Method

Measures

a. Demographic Variables Questionnaire. The demographic variables consisted of gender (1=Male, 2=female), age, student status (i.e. 1=Home/British, 2=European Union (EU), and 3=Non-European status/nationality) and faculty/school/division (i.e., 1=Arts and Humanities; 2=Engineering; 3=Medicine, Dentistry, and Health; 4=Science; and 5=Social Science) of the participants. Each faculty consists of different departments. The information regarding the department of participants was not obtained.

b. Brief Sensation Seeking Scale (BSSS). Sensation seeking has been operationally defined in terms of seeking novel, different, exciting and complex experiences and the readiness to take physical and social risks in pursuit of such experiences. The BSSS consisted of 8 items, which measured sensation seeking on a scale of 1-5 where 1 stood for 'Strongly Disagree' and 5 stood for 'Strongly Agree'. The scale included items such as, "I like to do frightening things" and "I would like to explore strange places" (Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, 2002).

c. The Cambridge Behaviours Scale (EQ). The Cambridge behaviours scale (Baron-Cohen & Wheelwright, 2004) known as the Empathy Quotient (EQ) had 40 items. The validity and reliability of this scale had been established (Lawrence et al., 2004). Empathy on the EQ was operationally defined in terms of the total score on the EQ. The score on each item could vary from 1-4 where 1 stood for 'Strongly Agree' and 4 stood for 'Strongly Disagree' on negatively worded items such as "I find it hard to know what to do in a social situation"; "Seeing people cry doesn't really upset me" and reverse scoring for positively worded items such as "I am good at predicting how

someone will feel”; “I really enjoy caring for other people”. Therefore, increase in the score would reflect increase in the level of empathy.

The subscales of empathy were taken from the three-factor structure presented in confirmatory factor analyses in previous studies with 5 items in each subscale (Gouveia, Milfont, Gouveia, Neto, & Galvão, 2012; Muncer & Ling, 2006). The three subscales were emotional reactivity (e.g. “Seeing people cry doesn’t really upset me”), cognitive empathy (e.g. “I am good at predicting how someone will feel”) and social skills (e.g. “I find it hard to know what to do in a social situation”). In the present study the emotional reactivity subscale consisted of item numbers 3, 16, 19, 33 & 39; the cognitive empathy subscale consisted of item numbers 14, 15, 29, 34, & 35; the social skills subscale consisted of item numbers 2, 4, 7, 8, & 21 (Baron-Cohen & Wheelwright, 2004; see Results for reliability coefficients).

d. *The Antisocial Behavior (ASB) Measure.* This consisted of 22 items taken from the Edinburgh Study of Youth Transitions and Crime survey (Smith & McVie, 2003). The respondent had to indicate his/her involvement in certain ASB such as “Stolen something from a shop or store”. Each item on the ASB Measure was scored on a scale of 1-5 where 1 stood for ‘Never’ and 5 stood for ‘Very Often’.

A conceptual classification of ASBs was used to distinguish two subscales, one for physically aggressive and one for non-aggressive ASBs. Reliability analysis was used to confirm this conceptual classification. The physically aggressive ASB subscale consisted of 7 items (item numbers 9, 10, 11, 14, 17, 18, & 19) representing actual or threatened ASB aimed at living things. This subscale consisted of items such as “Hit, spat, threw stones at someone you know” and “Threatened to hurt someone you know. The non-aggressive ASB subscale consisted of 10 items (item numbers 2, 3, 4, 5, 6, 12, 15, 16, 20, & 22) representing actual or threatened ASB towards non-living things such as damage to others’ personal belongings or public property (See Results section for reliability coefficients). The non-aggressive ASB subscale included items such as “Deliberately damaged or destroyed property that did not belong to you” and “Stolen something from a shop or store”.

Participants

The sample included 537 student volunteers from University of Sheffield, UK aged 18-25 years with 72% female students. Seventy-two per cent (n=389) identified themselves as home students (i.e., British), 9% (n=49) as EU students and 18% (n=99) identified themselves as Non-Europeans; 23% (n=125) were from Faculty of Arts and Humanities, 13% (n=70) from Engineering, 16% (n=83) from Medicine, Dentistry and Health, 27% (n=143) from Science, and 21% (n=114) were from Social Sciences.

Procedure

The ethics committee of Psychology department, University of Sheffield approved this research project. An online survey on Qualtrics software with self-report measures as mentioned above was developed. This survey was sent to the students of University of Sheffield through a university email distribution list consisting of an invitation to the study and a link to the survey. To attract participants, a prize draw of £50 was offered. The data were analyzed using SPSS IBM 21.

Results

Data screening

The demographic variables, the Brief Sensation Seeking Scale (Zuckerman et al., 1978), Empathy Quotient (Baron-Cohen & Wheelwright, 2004), and the Antisocial Behaviours Measure (Smith & McVie, 2003) were tested for normality. The Shapiro-Wilk normality tests for all the variables in this study were significant ($p < .001$) except for the mean score of sensation seeking ($p = .066$). Therefore, the data were non-normal. However, the standardized residuals were normal.

Reliability analyses

The reliability analyses were conducted on the subscales of empathy (See Method section). The three-factor structure consisting of cognitive empathy, emotional reactivity and social skills used in the current study was taken from confirmatory factor analysis in previous studies (Berthoz, Wessa, Kedia, & Wicker, 2008; Gouveia et al., 2012; Muncer & Ling, 2006). The reliability analysis indicated a Cronbach's coefficient alpha reliability of 0.82 ($N=5$) for cognitive empathy, 0.75 ($N=5$) for social skills, and 0.59 ($N=5$) for emotional reactivity. The reliability analysis for sensation seeking was 0.79 ($N=8$ items).

As a result of item deletion process, the items "13-Hit, kicked or punched a brother or sister on purpose", "21-Carried a knife or other weapon with you for protection or in case it was needed in a fight" were deleted from the physically aggressive ASB subscale and the items "1-Travelled on a bus or train without paying enough money", "7-Ignored someone you know on purpose, or left them out of things" and "8-Said nasty things about someone you know, slagged them off or called them names" were deleted from the non-aggressive ASB subscale.

The reliability analysis for the subscales of the ASB Measure (see Method section and Appendix) indicated an alpha coefficient of 0.77 ($N=7$) for physically aggressive ASB, and 0.76 ($N=10$) for non-aggressive ASB.

Correlational Analyses

Spearman rank correlational tests were conducted to test if subtypes of empathy have an inverse relationship with subtypes of ASBs. Table 1 shows the results. All three subtypes of empathy had a significant negative correlation with both subtypes of ASBs. Sensation seeking had a significant positive correlation with ASBs and a comparatively higher correlation with non-aggressive ASBs. Sensation seeking was also significantly related to social skills. Gender had a significant correlation with sensation seeking, subtypes of empathy and ASBs. Student status had significant relations with age, emotional reactivity, social skills, physically aggressive ASB and age. Age and faculty/school/division did not have a significant correlation with any of the variables.

Table 1

Correlations between subtypes of empathy, sensation seeking and subtypes of ASBs.
(N= 537)

Measure	1	2	3	4	5	6	7	8	9	10
1. Emotional reactivity	-									
2. Cognitive empathy	.37**	-								
3. Social Skills	.33**	.46**	-							
4. Sensation seeking	-.07	.07	.11*	-						
5. Physically aggressive ASB	-.19**	-.09*	-.16**	.15**	-					
6. Non-aggressive ASB	-.20**	-.09*	-.12**	.23**	.47**	-				
7. Gender	.35**	.14**	.16**	-	-	-.20**	-			
8. Age	-.03	.03	.02	-.06	-.03	-.003	.07	-		
9. Faculty	.05	-.03	-.01	.01	-.07	-.02	.07	-.02	-	
10. Student Status	-.14**	-.08	-	-.05		-.02	-.06			
			.20**		.12**			.25**		

Note. Correlation was significant at the 0.01 level (2-tailed).**

Correlation was significant at the 0.05 level (2-tailed).*

Regression Analyses

In order to probe the relative effects of empathy and sensation seeking, hierarchical regression analyses were performed for each subtypes of ASB with three subtypes of empathy, and sensation seeking.

Table 2 displays the results of a hierarchical regression investigating the relative roles of empathy subtypes and sensation seeking in predicting subtypes of ASBs while controlling for gender, faculty, age, and student status as covariates.

Table 2

Hierarchical regression showing subtypes of empathy and sensation seeking in predicting subtypes of ASB (N=537).

		Physically aggressive					
Variable		B	SE(B)	β	<i>t</i>	Sig. (p)	
Step 1	Gender	-.085	.023	-.161	-3.730	.000	<i>R</i>²=.035
	Faculty	-.004	.007	-.026	-.598	.550	
	Age	-.001	.005	.005	-.108	.914	
	Student Status	.025	.013	.082	1.846	.065	
Step 2	Gender	-.051	.024	-.096	-2.114	.035	<i>R</i>²=.070
	Faculty	-.003	.007	-.021	-.495	.621	
	Age	-.001	.005	-.007	-.162	.871	
	Student Status	.016	.013	.054	1.208	.228	
	Cognitive Empathy	-.002	.022	-.004	-.076	.939	
	Social Skills	-.030	.020	-.078	-1.555	.121	
	Emotional Reactivity	-.074	.023	-.159	-3.254	.001	
Step 3	Gender	-.043	.024	-.081	-1.786	.075	<i>R</i>²=.084
	Faculty	-.004	.007	-.024	-.572	.568	
	Age	-.00005	.005	.000	-.011	.991	
	Student Status	.017	.013	.058	1.302	.194	
	Cognitive Empathy	-.005	.022	-.011	-.217	.828	
	Social Skills	-.037	.020	-.093	-1.870	.062	
	Emotional Reactivity	-.068	.023	-.146	-2.997	.003	
	Sensation Seeking	.038	.013	.121	2.821	.005	
Variable		Non-Aggressive					
		B	SE(B)	β	<i>t</i>	Sig. (p)	
Step 1	Gender	-.086	.019	-.193	-4.478	.000	<i>R</i>²=.037

	Faculty	.001	.006	.011	.256	.798	
	Age	.002	.004	.020	.458	.647	
	Student Status	-.003	.001	-.010	-.225	.822	
Step 2	Gender	-.061	.020	-.137	-3.020	.003	$R^2=.065$
	Faculty	.002	.006	.015	.357	.721	
	Age	.002	.004	.019	.440	.660	
	Student Status	-.010	.011	-.037	-.838	.402	
	Cognitive Empathy	.001	.019	.004	.075	.940	
	Social Skills	-.030	.017	-.090	-1.794	.073	
	Emotional Reactivity	-.051	.019	-.130	-2.665	.008	
Step 3	Gender	-.050	.020	-.112	-2.503	.013	$R^2=.104$
	Faculty	.001	.006	.010	.239	.811	
	Age	.003	.004	.030	.707	.480	
	Student Status	-.008	.011	-.031	-.708	.479	
	Cognitive Empathy	-.003	.018	-.008	-.162	.871	
	Social Skills	-.038	.016	-.116	-2.335	.019	
	Emotional Reactivity	-.043	.019	-.109	-2.259	.024	
	Sensation Seeking	.053	.011	.203	4.799	.000	

Note. $^{**}p<.001$, $^{*}p<.05$

Table 2 shows that only emotional reactivity as an empathy subtype negatively predicted physically aggressive and non-aggressive ASBs with a greater variance in the case of physically aggressive ASBs. Gender negatively predicted physically aggressive ASBs and non-aggressive ASBs with a greater variance in the case of non-aggressive ASBs. When sensation seeking was added into the hierarchical regression model, low emotional reactivity and high sensation seeking became significant predictors, whereas gender became a non-significant predictor of physically aggressive ASBs. In contrast, high sensation seeking, low emotional reactivity, low social skills, and gender emerged as significant predictors of non-aggressive ASBs. Sensation seeking predicted non-aggressive ASBs with a greater variance as compared to physically aggressive ASBs.

Finally, stepwise regression was conducted to explore the competitive effects of the empathy subtypes and sensation seeking in predicting the ASB subtypes controlling for gender, faculty, age, and student status as covariates.

Stepwise regression showing subtypes of empathy and sensation seeking traits in predicting subtypes of ASB (N=537).

Variable		Physically aggressive					
		B	SE(B)	β	t	Sig. (p)	
Step 1	Gender	-.085	.023	-.161	-3.730	.000	$R^2=.035$
	Faculty	-.004	.007	-.026	-.598	.550	
	Age	-.001	.005	-.005	-.108	.914	
	Student Status	.025	.013	.082	1.846	.065	
Step 2	Gender	-.052	.024	-.098	-2.176	.030	$R^2=.065$
	Faculty	-.003	.007	-.021	-.493	.622	
	Age	-.001	.005	-.011	-.255	.799	
	Student Status	.020	.013	.065	1.484	.138	
	Emotional Reactivity	-.086	.021	-.184	-4.060	.000	
Step 3	Gender	-.046	.024	-.086	-1.900	.058	$R^2=.076$
	Faculty	-.004	.007	-.023	-.557	.578	
	Age	-.001	.005	-.006	-.143	.887	
	Student Status	.021	.013	.071	1.617	.106	
	Emotional Reactivity	-.084	.021	-.179	-3.969	.000	
	Sensation Seeking	.033	.013	.107	2.519	.012	
Step 4	Gender	-.043	.024	-.081	-1.795	.073	$R^2=.084$
	Faculty	-.004	.007	-.024	-.566	.572	
	Age	-.00007	.005	-.001	-.014	.989	
	Student Status	.017	.013	.057	1.295	.196	
	Emotional Reactivity	-.069	.022	-.148	-3.155	.002	
	Sensation Seeking	.038	.013	.120	2.816	.005	
	Social Skills	-.038	.018	-.098	-2.160	.031	
Variable		Non-aggressive					
		B	SE(B)	β	t	Sig. (p)	
Step 1	Gender	-.086	.019	-.193	-4.478	.000	$R^2=.037$
	Faculty	.001	.006	.011	.256	.798	
	Age	.002	.004	.020	.458	.647	
	Student Status	-.003	.011	-.010	-.225	.822	
Step 2	Gender	-.075	.019	-.168	-3.928	.000	$R^2=.073$
	Faculty	.001	.006	.007	.155	.877	
	Age	.003	.004	.029	.664	.507	
	Student Status	.000	.011	-.001	-.017	.986	
	Sensation Seeking	.051	.011	.193	4.537	.000	
Step 3	Gender	-.064	.019	-.144	-3.376	.001	$R^2=.094$
	Faculty	.001	.006	.007	.175	.861	
	Age	.004	.004	.036	.831	.406	
	Student Status	-.007	.011	-.026	-.603	.547	
	Sensation Seeking	.056	.011	.211	4.997	.000	

	Social Skills	-.050	.014	-.152	-3.527	.000	
Step 4	Gender	-.050	.020	-.112	-2.512	.012	$R^2=.104$
	Faculty	.001	.006	.010	.244	.807	
	Age	.003	.004	.030	.706	.481	
	Student Status	-.008	.011	-.031	-.717	.474	
	Sensation Seeking	.053	.011	.203	4.801	.000	
	Social Skills	-.039	.015	-.120	-2.670	.008	
	Emotional Reactivity	-.044	.018	-.111	-2.378	.018	

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

Table 3 shows that low emotional reactivity was the most significant predictor of physically aggressive ASBs while sensation seeking was the most significant predictor of non-aggressive ASBs.

Discussion

In summary, when the regressions were limited to the subtypes of empathy, only the emotional reactivity subtype was a significant predictor (Table 2) both for physically aggressive and non-aggressive ASBs. The percentage of variance accounted for was modest ($R^2=0.070$ and $R^2=0.065$ respectively). By contrast, when sensation seeking was added in (Table 2), sensation seeking accounted for the greatest variance, with emotional reactivity in predicting physically aggressive ASBs ($R^2=0.084$) and with emotional reactivity, social skills, and gender also contributing significantly in predicting non-aggressive ASBs ($R^2=0.104$). Percentages of variance accounted for were increased, especially for non-aggressive ASBs ($R^2=0.084$ and $R^2=0.104$ respectively).

The first hypothesis **H₁**: That cognitive empathy, emotional reactivity and social skills would be inversely and sensation seeking would be positively related to physically aggressive and non-aggressive ASBs was supported (Table 1). The second hypothesis **H₂**: That low emotional reactivity would predict physically aggressive ASBs while low cognitive empathy and social skills would predict non-aggressive ASBs was partially supported (Table 2). The third hypothesis **H₃**: That high sensation seeking and low emotional reactivity would predict physically aggressive ASBs while high sensation seeking and low cognitive empathy would predict non-aggressive ASBs was partially supported (Table 2). The fourth hypothesis **H₄**: That low emotional reactivity and high sensation seeking would be the most significant predictors of physically aggressive non-aggressive ASBs was partially supported (Table 3).

Relationship between subtypes of empathy, sensation seeking, subtypes of ASBs and demographic variables (Table 1, first hypothesis)

The Spearman rank correlations showed that subtypes of empathy i.e. emotional reactivity, cognitive empathy and social skills, had an independent inverse correlation with physically aggressive and non-aggressive ASBs. This corresponds to previous findings, which have also shown an inverse relationship between subtypes of empathy and subtypes of ASBs (e.g. Kokkinos et al., 2014; Shechtman, 2002; Vitaro, Brendgen, & Barker, 2006).

We note that these findings indicate that the direction of relationship was inverse for all three subtypes of empathy in relation to both physically aggressive and non-aggressive ASBs. Emotional reactivity had a higher correlation to both physically aggressive and non-aggressive ASBs followed by social skills and cognitive empathy. Therefore, emotional reactivity was the most important subtype of empathy and cognitive empathy was the least important subtype of empathy in relation to subtypes of ASBs. This corresponds to previous findings (e.g. Aaltola, 2013; de Kemp, Overbeek, de Wied, Engels, & Scholte, 2007; Jolliffe & Farrington, 2006, 2007, 2011; Maurage et al., 2011; Shechtman, 2002).

The current results contradicted previous findings, which have indicated a positive correlation or no correlation of empathy subtype to ASB subtypes (e.g. Ang & Goh, 2010; Mayberry & Espelage, 2007; Milojević & Dimitrijevic, 2014). Those studies may have found different results from the current study because they had different definitions for aggressive ASBs and different sample characteristics. In Mayberry and Espelage (2007), aggressive ASBs were referred to proactive and reactive aggression subtypes and non-aggressive ASBs were referred to uninvolved youth. In [Milojević and Dimitrijevic](#) (2014) the sample was juvenile offenders rather than students. In Ang and Goh (2010) there was no difference in cognitive empathy between groups with high and low levels of cyber-bullying for female participants.

Research showing the involvement of sensation seeking in non-aggressive ASBs (e.g. Ball et al., 1994; Carrasco et. al., 2006; Harden et. al., 2015; Sijtsma, et. al., 2010; Xu et. al., 2014) and physically aggressive ASBs (e.g. Cui et. al., 2015; Dahlen et. al., 2004, 2005; Shukla, & Pradhan, 2015) was supported. The current research demonstrated that sensation seeking had a higher positive correlation with non-aggressive ASBs than with physically aggressive ASBs.

Apart from the first hypothesis, some interesting correlations were observed. The finding that sensation seeking was positively related to social skills has been supported in some studies (e.g. Beyers et. al., 2004; Rezayi, 2014). However, social skills have also been related to low sensation seeking (Silmere, 2008). Being a male was related to high sensation seeking, low emotional reactivity, low cognitive empathy, low social skills and high physically aggressive and non-aggressive ASBs thus supporting the literature (e.g. Berg et. al., 2015; Ball et al., 1984; Shulman et al., 2015). Being an overseas student, i.e., European/non-European was related to increase in age, low emotional reactivity, low social skills, and high physically aggressive ASB. Although, there is evidence regarding low social skills amongst international students (e.g. Rosenthal et al., 2007), there is no explicit evidence regarding existence of low empathy subtypes and high ASB amongst overseas students.

Subtypes of empathy as predictors of subtypes of ASBs in the hierarchical regression model controlling for gender, faculty, age, and student status (Table 2, second hypothesis)

Previous researchers (Kokkinos et al., 2014) have found an inverse relationship between emotional reactivity and cyber-bullying which is a different type of non-aggressive ASBs. The present study showed that emotional reactivity was inversely related to both physically aggressive (ASBs targeted against people/animals) and non-aggressive behaviours (ASB targeted against objects, or people indirectly through destruction of property). These findings corroborated previous literature (e.g. Aaltola,

2013; Shechtman, 2002) which also showed an inverse relation of affective empathy to subtypes of ASBs. Amongst all the subtypes of empathy, only emotional reactivity inversely predicted both physically aggressive and non-aggressive behaviours.

As predicted, cognitive empathy and social skills did not predict non-aggressive ASBs. Low cognitive empathy is generally related to ASBs (e.g. Buck, 2013). Furthermore, cognitive empathy has been also associated with non-aggressive ASBs such as cyberbullying, an indirect form of aggression (e.g. Schultze-Krumbholz & Scheithauer, 2015). However, the relationship between cognitive empathy and ASBs has been inconsistent (e.g. Almeida, et al., 2015; Jolliffe & Farrington, 2004; van Leeuwen et al., 2014). Therefore, no conclusion can be drawn about the relationship between cognitive empathy and ASBs. Low social skills are more likely to predict non-aggressive ASBs (e.g. Espelage et al., 2015; Yeo et al., 2011) but they have been inversely related to both subtypes of ASBs (e.g. Ttofi et al., 2014). However, social skills did not emerge as a predictor of ASB subtypes in the hierarchical regression of all subtypes of empathy in the present study.

In contrast, the present study showed that emotional reactivity was more likely to predict physically aggressive ASBs as compared to non-aggressive ASBs. Viding et al. (2009) suggest that physically aggressive ASBs in the form of direct bullying (i.e. hitting, kicking, etc) are generally linked to low empathy. Another study found a relationship between low emotional arousal and preference for violent video games (Brockmyer, 2015). However, past research does not indicate if emotional reactivity as a subtype of empathy is more likely to predict physically aggressive ASBs than predict non-aggressive ASBs. From the present study it may be inferred that low levels of emotional reactivity predicts ASB among normal educated individuals.

The current findings contradicted studies which did not find any relationship or a positive relationship of affective empathy to physically aggressive and non-aggressive ASBs (e.g. Dadds et al., 2009; Domes, Hollerbach, Vohs, Mokros, & Habermeyer, 2013; Hosker-Field, 2011; Milojević & Dimitrijevic, 2014; van Heerebeek, 2010). The reason for this contradiction may be attributed to the different definitions of subtypes of empathy and different definitions of subtypes of ASBs used in past studies, as well as the different demographic characteristics of the participants in the literature (e.g. Feilhauer & Cima, 2013; Jones et. al., 2010).

Another interesting finding was gender as a predictor of ASBs in addition to low emotional reactivity as a predictor. Maleness has been consistently related to ASBs (e.g. Bachman et al., 1998; Eme, 2013; Nansel et al., 2001). The characteristic of being a male predicted ASBs particularly non-aggressive ASBs. However, male individuals are more likely to be involved in physically aggressive ASBs (Demissie et al., 2015; Chung-Do et al., 2015; Ibabe & Bentler, 2015).

Sensation seeking and subtypes of empathy as predictors of subtypes of ASBs in the hierarchical regression model controlling for gender, faculty, age, and student status (Table 2, third hypothesis)

Hierarchical regression revealed different pathways towards physically aggressive and non-aggressive ASBs. Low emotional reactivity emerged as the significant predictor followed by high sensation seeking in physically aggressive ASBs. This finding

supported previous research (e.g. McTernan et al., 2014), which showed the involvement of high sensation in physical aggression. High sensation seeking followed by low emotional reactivity, low social skills, and gender (maleness) predicted non-aggressive ASBs. Improvement in social skills has shown to reduce ASBs (O’Handley, Radley, & Cavell, 2015).

Earlier studies have identified emotional reactivity and sensation seeking as predictors of physically aggressive ASBs, and cognitive empathy as a predictor of non-aggressive ASBs (e.g. McTernan et al., 2014; Pouw, Rieffe, Oosterveld, Huskens, & Stockmann, 2013; Pursoo, 2013; Yeo et al., 2011). In the present study, both high sensation seeking and low emotional reactivity also emerged as significant predictors of non-aggressive ASBs. Thus this is a novel finding because high sensation seeking and emotional reactivity are more likely to predict physically aggressive ASBs (e.g. McTernan et al., 2014). We suggest that sensation seeking and emotional reactivity emerged as significant predictors of non-aggressive ASBs because non-aggressive ASBs in this study were defined in terms of violent behaviours such as fire-setting, breaking into a car to steal something or display of rowdy public behaviours.

Past studies have not demonstrated the competing effects of sensation seeking traits with subtypes of empathy in predicting both physically aggressive and non-aggressive ASBs while controlling for gender, faculty, age, and student status. The present study not only revealed the competing effects of sensation seeking with subtypes of empathy but also revealed that the addition of sensation seeking changed the relationship between subtypes of empathy and subtypes of ASBs with respect to social skills. Social skills were not significant in the absence of sensation seeking traits (Table 2). However, social skills became a significant predictor of non-aggressive ASBs in the regression model with sensation seeking traits. This might have occurred due to a relationship between sensation seeking and social skills, which was beyond the scope of this study.

The finding that low social skills predicted non-aggressive ASBs while low emotional reactivity predicted physically aggressive ASBs was in line with previous studies (see Table 2; e.g. Jolliffe & Farrington, 2004; Lunsford, 2014; van Langen et al., 2014; Xu et al., 2014; Yeo et al., 2011). Although low social skills are associated with ASBs (e.g. Buck, 2013; Ttofi et al., 2014) and problematic behaviours (e.g. Qi & Kaiser, 2003), some studies (e.g. Carpenter, & Nangle, 2006) also contradict the inverse relationship between social skills and subtypes of ASBs. There is limited evidence regarding the specific relationship of social skills to physically aggressive and non-aggressive ASBs. Therefore, the finding that low social skills also predicted physically aggressive ASBs is a new finding.

Stepwise regression showing sensation seeking and subtypes of empathy as predictors of subtypes of ASBs in the hierarchical regression model controlling for gender, faculty, age, and student status (Table 3, Fourth hypothesis)

Step-wise regression revealed that low emotional reactivity followed by high sensation seeking and low social skills significantly predicted physically aggressive ASBs, but high sensation seeking social skills, gender and emotional reactivity significantly predicted non-aggressive ASBs. The fourth hypothesis that low emotional reactivity and high sensation seeking would be the most significant predictors of physically aggressive non-aggressive ASBs was partially supported because both emotional

reactivity and sensation seeking did not emerge as the strongest predictors of both physically aggressive and non-aggressive ASBs.

Low emotional reactivity emerged as the most significant predictor of physically aggressive ASBs and high sensation seeking emerged as the most significant predictor of non-aggressive ASBs, thus indicating different pathways towards subtypes of physically aggressive and non-aggressive ASB.

Conclusion and Implications

This study demonstrated the competing effects of empathy subtypes (i.e. emotional reactivity, cognitive empathy, and social skills) in predicting physically aggressive (involving direct actual or threatened aggression against living beings) and non-aggressive ASBs (involving indirect actual or threatened aggression against people through stealing or damaging their property, or public rowdiness). All the empathy subtypes were inversely associated with physically aggressive and non-aggressive ASBs. Emotional reactivity was a significant inverse predictor of both ASB subtypes. Social skills emerged as significant inverse predictor of ASB subtypes when both high sensation seeking and low emotional reactivity predicted both ASB subtypes.

Emotional reactivity and sensation seeking emerged as the significant predictors of both ASB subtypes. Low emotional reactivity primarily predicted physically aggressive ASBs and high sensation seeking primarily predicted non-aggressive ASBs thus revealing different pathways towards physically aggressive and non-aggressive ASBs.

This is a novel study because the current classification of physically aggressive and non-aggressive ASBs has not been examined in relation to subtypes of empathy and sensation seeking. Furthermore, this study not only examined the competing effects of subtypes of empathy, but also the competing effects of two opposing socio-affective emotions (i.e. empathy and sensation seeking) in physically aggressive and non-aggressive ASBs among normal educated youth. There has been a lack of research on emotional reactivity as an empathy subtype.

As low emotional reactivity was the main predictor of physically aggressive ASBs and high sensation seeking was the main predictor of non-aggressive ASBs, we might suggest that physically aggressive ASBs are driven by deficient emotions in response to others' pain whereas non-aggressive ASBs are driven by heightened pleasure seeking emotions. Different interventions might be needed for youth involved in physically aggressive and non-aggressive ASBs subtypes. This finding suggests that emotional reactivity, as a form of empathy is necessary to prevent physically aggressive ASBs. The idea of an empathy museum (e.g., Gittins & Vuk, 2014) might enable people to develop emotional reactivity. Through sharing of emotional stories verbally, in the form of pictures, videos, and artifacts, people belonging to different racial, religious, political groups might be able to develop emotional reactivity for each other. Furthermore, emotional empathy training (Erera, 1997) might prevent the frequency of physically aggressive ASBs. On the other hand, sensation-seeking tendencies might be channelized into positive social activities such as challenging as well as rewarding academic and extra curricular activities (Li, Olson, & Frieze, 2013) to prevent non-aggressive ASBs among youth. Zuckerman (2014) suggests that sensation seekers might benefit from marital counseling. Hence this research might help in considering

the development, and testing of interventions designed to tackle these subtypes of ASBs amongst youth.

The current findings may lead towards future studies, which could explore other socio-affective, environmental and neural correlates and causal mechanisms underlying low emotional reactivity and sensation seeking in physically aggressive and non-aggressive ASBs. The variance for non-aggressive ASBs was greater than the variance for physically aggressive ASBs. Given the combined greater variance of sensation seeking, social skills, and gender in non-aggressive ASBs and that gender was a significant predictor of non-aggressive ASBs instead of physically aggressive ASBs, we might surmise that sensation seeking, social skills, and the male gender made a large contribution to non-aggressive ASBs (See Table 3). Males were more likely to engage in ASBs particularly non-aggressive ASBs. Future research might explore gender as a moderator or a correlate of other socio-affective personality traits in relation to physically aggressive and non-aggressive ASB subtypes.

The research would contribute towards understanding of the normal functioning of socio-affective traits in relation to ASBs. Consequently, the research can assist in the development of personality models amongst normal educated youth to predict crimes against living things and crimes against others' possessions.

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