

Research Paper: Explaining Anger in Atypical Social Anxiety Disorder Based on Impulsivity and Risk Perception



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ABSTRACT

Objective: The present research aimed at explaining anger in individuals with the atypical pattern of Social Anxiety Disorder (SAD) based on impulsivity and risk perception.

Methods: The present study used a cross-sectional design. The research population included all students of Arak University; of which, 450 individuals were selected by convenience sampling method. Firstly, the Social Phobia Inventory, Dickman Impulsivity Inventory, Risk Perception Scale, and Novaco Anger Scale were performed in them. Then, based on their obtained scores in social anxiety, 124 individuals with scores ≥ 19 were selected as the final research sample.

Results: Multiple regression data indicated that impulsivity and risk perception predict 36% of the variance of anger in individuals with social anxiety ($F_{2,121} = 33.70, P < 0.001$); impulsivity directly ($\text{Beta} = 0.423$) and risk perception inversely ($\text{Beta} = -0.297$) presented a significant contribution in predicting the study subjects' anger.

Conclusion: It is necessary to pay serious attention to impulsivity and risk perception in understanding and treating individuals with SAD and their anger.

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Highlights

- The atypical pattern of social anxiety is different from its prototype.
- Based on this pattern, the impulsivity and risk perception can predict the variance of anger in individuals with social anxiety.
- It is necessary to pay serious attention to impulsivity and risk perception in understanding and treating individuals with SAD and their anger.

Plain Language Summary

A subset of individuals with social anxiety disorder who are aggressive, impulsive, and novelty seeker is different from its prototype. This research aimed to explain anger in individuals with the atypical pattern of SAD based on impulsivity and risk perception. Previous studies failed to concurrently explain the relationship between impulsivity, risk perception and anger concerning the atypical pattern of SAD. The results of this research showed that risk perception and impulsivity are essential variables in predicting anger in individuals with SAD. Impulsivity directly predicted the level of anger, but risk perception inversely predicted it. In other words, the more individuals with SAD encounter higher risk perception, the less they are involved in hostile and aggressive behaviors. Thus, risk-taking and impulsive individuals with SAD may not well benefit from existing interventions. Accordingly, accurate diagnosis and better treatment of these individuals is necessary concerning modifying their risk perception and impulsivity.

1. Introduction

Social Anxiety Disorder (SAD) is a relatively prevalent condition, with a 12-month prevalence of approximately 7% (American Psychiatric Association, 2015). According to the definitions, social anxiety is also referred to as social phobia, which involves a persistent and excessive fear of being ashamed or scrutinized and evaluated negatively in social situations or at the time of engaging in activities in the presence of others (Cremers & Roelofs, 2016). Individuals with SAD are assumed to form a homogeneous group that can be perceived through comparison with those without this illness. Accordingly, most studies described the prototypical manifestation of SAD as a shy, submissive, inhibited, and risk-averse individual (Crozier, & Alden, 2001; quoted by Kashdan & McKnight, 2010) with high avoidance (O'Toole, Zachariae, & Mennin, 2017). However, such a description of SAD has been challenged in recent years; this is because a subset of individuals with SAD who are aggressive, impulsive, and novelty seeker is different from that prototype. This subset of SAD is associated with presenting behavioral patterns, i.e. without resemblance to imaginable shyness, inhibition, and submissiveness in the prototype of SAD. Furthermore, compared to inhibited socially anxious individuals (i.e. compatible with the prototype), manifest more functional impairment (Kashdan & McKnight, 2010). These behav-

ioral patterns represent an atypical pattern of SAD (Meortberg, Tillfors, Van Zalk, & Kerr, 2014). Researchers also suggested that about 35% of the non-clinical population with SA indicate approach-based impulsive behaviors, i.e. compatible with this atypical socially anxious-impulsive group (Kashdan, Elhai, & Breen, 2008). However, SA is rarely discussed concerning aggressive and angry behaviors and impulsive acts (Kashdan and McKnight, 2010), as well as other risky behaviors.

Anger seems to be an essential characteristic in individuals with SAD, according to this atypical pattern. Anger is defined as an emotional reaction, i.e. displayed to unsatisfied requests, undesired results, and unmet expectations (Soykan, 2003; quotes from Duran, Ergün, Tekir, Çalışkan, & Karadaş, 2018), or is created by threat perception (Walsh, Wolk, Becker-Haimes, Jensen-Doss, & Beidas, 2018). Individuals with SAD exhibit elevated levels of anger and anger suppression (Versella, Piccirillo, Potter, Olino, & Heimberg, 2016). Researchers have reported retaliatory anger and aggression related to the imagination of rejection and unacceptance by others (Leary, Twenge, & Quinlivan, 2006), paradoxical behaviors based on aggressive and angrily acts (Kashdan & McKnight, 2010), periods of greater anger over social and non-social situations (Kashdan & Collins, 2010), as well as Emotion Regulation (ER) strategies through aggressive action (Keil, Asbrand, Tuschen-Caffier, & Schmitz, 2017) in individuals with SAD.

A variable involved in the anger of individuals with SAD is the rate of impulsivity. Impulsivity is defined as a predisposition to presenting rapid and unplanned reactions to internal and external stimuli without considering the adverse consequences of these reactions (Moeller, Barrat, Dougherty, Schmitz, & Swann, 2001), or even the tendency to behave voluntarily with little or no prior consideration of the consequences (VandenBos, 2007; quoted by Ryu et al., 2018). This variable includes characteristics, such as irritability, patience-impatience, aggressivity, response control, and so on. (Lecrubier, Braconnier, Said, & Payan, 1995). Impulsivity is a determinant component of numerous psychiatric disorders (Besharat, Nikfarjam, Mohammadi Hasel, Zabihzadeh, & Fallah, 2017; Besharat, Dehghani, Masoudi, Pourkhaghan, & Motahari, 2015). For example, Emotion-relevant impulsivity predicts sustained anger and aggression after remission in bipolar I disorder (Johnson & Carver, 2016); inhibitory control is also considered to be a key factor in explaining individual differences in anger and reactive aggression (Lievaart, van der Veen, Huijding, Hovens, & Franken, 2018). Accordingly, impulsivity seems to be strongly correlated with anger in those with SAD. Kashdan et al. (2009) explored impulsive risk-prone behaviors in a sample of individuals with SAD. Subsequently, 21% of them reported high aggression and moderate levels of sexual impulsivity. Other researchers have also reported that SAD symptoms were significantly correlated with emotion-driven impulse control difficulties, anger, and hostility. They indicated that SAD indirectly influences each facet of aggression through emotion-driven impulse control difficulties (Dixon, Tull, Lee, Kimbrel, & Gratz, 2017).

Risk perception is another variable associated with anger in individuals with SAD. Risk is perceived in two fundamental ways; as feelings that refer to our instinctive and intuitive reactions to danger, and as analysis that brings logic, reason, and scientific deliberation to bear on risk assessment and decision making (Slovic & Peters, 2006). It seems that anger and risk perceptions are closely related. For example, angry individuals have optimistic estimates of risk and prefer the risk-seeking choices (She, Eimontaite, Zhang, & Sun, 2017). Accordingly, it is also possible that risk perception in individuals with SAD is related to the extent of anger and hostility, and even their aggressive behaviors. For instance, novelty seeking and high risk-prone [associated with lower risk perception] are suggested to be associated with impulsivity and anger in individuals with SAD (Cloninger, Przybeck, Svrakic, & Wetzel, 1994; quoted by Meortberg et al. 2014). In this context, other scholars indicated that about 41% of adults with SAD make

impulsive decisions to seek out novel information and experiences, without considering the potential dangers (Kashdan & Hofmann, 2008) that may also be accompanied by anger and aggression. Another study (Kashdan et al., 2008) revealed that a disinhibited socially anxious and risk-taking group reported more problems in managing negative emotions and hostile impulses, compared to the groups with inhibited social anxiety or without it. Moreover, in a 3-months follow-up, the disinhibited group reported more frequent social interactions, as well as more frequent risky sexual behavior, aggression, and substance abuse, compared to the other groups.

The investigations mentioned above separately identified impulsivity and risk perception as important variables in the anger of individuals with SAD; however, they disregarded impulsivity and risk perception simultaneously, in this relation. Furthermore, previous research has mostly examined the risk-taking behaviors that can be different from risk perception as a cognitive variable. In other words, risk perception is a cognitive variable that may be effective on risk-taking, but it is different from it. Accordingly, this research examined risk perception as a rarely examined variable concerning the anger of individuals with SAD. Previous studies also failed to concurrently explain the relationship between impulsivity and risk perception and anger concerning the atypical pattern of SAD. This pattern can provide a better understanding of this relationship, as indicated in the explanation of impulsivity and aggression of individuals with SAD. Accordingly, conducting the present research will enhance the explanatory extent of this pattern, especially with considering the simultaneous relationship between impulsivity and risk perception and anger in individuals with SAD. Therefore, the present study aimed to explain anger in individuals with SAD based on the extent of their impulsivity and risk perception, according to the atypical pattern of anxious-impulsive SAD.

2. Methods

The present study used a cross-sectional design. The statistical population of this study was all students of Arak University; of which, 450 individuals were selected based on convenience sampling approach. The distribution of P (the proportion of one trait in population) of this study was unknown. Besides, exploring the socially anxious individuals were somewhat difficult; accordingly, without the statistical calculating of sample size, a sample with the least adequate number, for a correlational study was selected. Moreover, given that in multiple regression analysis, the sample size should be at least 100 subjects or about 20 times higher than the variables

(Hooman, 2001). For this purpose, first, the Social Phobia Inventory (SPIN), Dickman Impulsivity Inventory (DII), Risk Perception Scale (RPS), and Novaco Anger Scale (NAS) were performed in all 450 selected students. Then, based on their obtained scores in social anxiety, 124 individuals were selected as the final study sample. The inclusion criteria for selecting the final sample were as follows: experiencing SAD based on the scores of SPIN (≥ 19); the lack of serious problems, such as severe biopsychological illnesses (except for the social anxiety), and having consent for participating in the research. The exclusion criterion of the study was providing incomplete inventories. To conduct this research, after coordinating with the study participants and presenting the necessary explanations to them, the questionnaires were performed and the necessary data were collected. Finally, the obtained data were analyzed using simultaneous multiple regression analysis.

The SPIN was developed by Connor et al. (2000) and includes questions that measure fear, avoidance, and physiological discomfort. Each of its 17 items is rated on a scale from 0 to 4: not at all, a little bit, somewhat, very much, and extremely; with higher scores corresponding to greater distress. The full-scale score thus ranges from 0 to 68. A SPIN score of 19 distinguishes between social phobia subjects and a control group. The internal consistency of this test has been reported to range from 0.87 to 0.94 for subjects with social phobia and 0.82 to 0.90 for the controls. Its construct validity was also demonstrated by proving that various extents of the severity of social phobia would be reflected by different levels in the SPIN score (Connor et al., 2000). In Iran, the reliability of this test was obtained through Cronbach's alpha coefficient and test-retest methods (0.98 & 0.84, respectively), and its validity (0.83) was obtained through correlation examination with the anxiety test of Symptom Checklist-90 (SCL-90) (Hassanvand Amouzadeh, 2016).

DII was developed by Dickman (1990) and includes 23 items. This inventory originally consists of two separate subscales of functional impulsivity (11 items) and dysfunctional impulsivity (12 items), i.e. rated with a true/false answering format (Dickman, 1990). However, to more accurately measure the impulsivity of individuals, its items have been scored on a five-point Likert-type scale, where 0 indicates completely false and 4 reflects completely correct. Additionally, by reversing the scoring for functional impulsivity items, this inventory has been used as a single test for dysfunctional impulsivity, in which higher scores indicate greater dysfunctional impulsivity. The internal consistency of the functional impulsivity subscale was reported to be 0.74 and the dysfunctional impulsivity subscale was measured as 0.85 (Dickman, 1990). In Iran, Ekhtiari et al.

(2008) reported Cronbach's alpha coefficient of the functional impulsivity and dysfunctional impulsivity subscales to range between 0.43 and 0.75 for healthy and substance-dependent groups. This inventory has revealed a favorable correlation with other impulsivity scales, such as the Barratt Impulsivity Scale and Eysenck Impulsiveness Questionnaire, which has its acceptable validity (Dickman, 1990; Ekhtiari et al., 2008).

RPS includes 7 items, developed based on the risk perception questionnaire, i.e. devised by Bentin, Slovic, & Severson (1993; quoted by Hablemitoglu, & Yildirim, 2008), concerning adolescents' risk perception. Respondents express their quantitative attitudes about 7 considered risky behaviors and activities regarding represented risk-taking during youth (Hablemitoglu, & Yildirim, 2008). This scale is scored on a Likert-type scale, ranging from completely agree to completely disagree from 1 to 5, respectively. The 1 and 7 items of this scale are scored reversely. The sum of the scores of the 7 statements constitutes the total score of the scale (Zare & Aerab Sheibani, 2012). The reliability of this scale has been reported (0.87) through Cronbach's alpha coefficient (Hablemitoglu & Yildirim, 2008). In another study, its Cronbach's alpha coefficient was equal to 0.89. Its content validity was confirmed by cognitive science experts. Furthermore, its construct validity was reported as acceptable through a significant correlation with rational and avoidant decision-making styles (Zare & Aerab Sheibani, 2012).

NAS (Novaco, 1994) is a 25-item self-report instrument that refers to anger-eliciting situations (Hornsveld, Muris, & Kraaimaat, 2011). These items measure the anger intensity and describe situations that can potentially elicit anger. Respondents report anger intensity on a 4-point scale ranging from not at all angry to very angry, being scored from 1 to 4, respectively. All provocation types concern disrespect, unfairness, frustration, the annoying traits of others, and irritations as content areas; however, the sole psychometric index is the total score of this scale. Higher scores indicate greater anger (Moeller, Novaco, Heinola-Nielsen, & Hougaard, 2016). The reliability and validity of this scale have been confirmed by different researchers (Moeller et al., 2016; Hornsveld et al., 2011). The internal reliability of the scale has been reported as 0.95 (Novaco, 2003; quoted by Moeller et al., 2016). Also, its reliability was reported to be 0.86 with Cronbach's alpha coefficient and 0.73 with test-retest methods. The construct validity of the scale was also obtained (0.88) by examining its correlation with the Buss and Perry Aggression Questionnaire. Its content validity was also confirmed by the relevant experts (Malekpour, Zangeneh, & Aghababaei, 2012).

3. Results

The collected data were analyzed using descriptive and inferential statistical methods. Descriptive analyzes data indicated that the Mean±SD age of the study sample 21.11±1.71 years. Besides, its social anxiety Mean±SD was calculated as 32±10.15. The mean value of SA scores in the examined group was higher than that of the cutoff point of social anxiety inventory (≥19); this score was considered for identifying the members of the sample group with SAD. The descriptive indices of anger, impulsivity, and risk perception as well as the correlation between these variables in the examined sample are also reported in Table 1.

As per Table 1, the Mean±SD values of anger were reported as the criterion variable and impulsivity and risk perception as predictor variables. Table 1 presents a positive and significant correlation between impulsivity and anger ($r=0.53$); however, there was a negative and significant correlation between risk perception and anger ($r=-0.45$). Additionally, there was a negative and significant correlation between impulsivity and risk perception as the predictor variables of the research ($r=-0.36$). All of these correlations were significant at $P<0.01$.

The simultaneous multiple regression analysis was used to examine the research hypotheses. The same test was applied to determine the contribution of impulsivity and risk perception in predicting and explaining anger in individuals with SAD. Prior to implementing the simultaneous multiple regression, its presumptions were examined; the Kolmogorov-

Smirnov test data revealed that the distribution of variables was normal at $P<0.01$. Besides, there was a co-linearity of variables, i.e. despite the significant correlation ($r=-0.36$) between impulsivity and risk perception as predictor variables. Moreover, given that this correlation was not very strong, and their tolerance index was equal to 0.870 (not <0.1), there was no particular concern about the existence of co-linearity of variables. In addition, the independence of errors by the Durbin-Watson test also signified a value of 1.831, ranging from 1.5 to 2.5, and this presumption was also true. Accordingly, given the existence of these presumptions and the possibility of using regression, Table 2 lists the model summary and regression results.

Table 2 summarizes the results of simultaneous multiple regression analysis. As per this table, impulsivity and risk perception predicted 36% of the anger variance of the explored subjects with SAD ($F=33.70$, $P<0.001$). Examining the regression coefficients also demonstrated that impulsivity, with a Beta coefficient of 0.423 and risk perception with a Beta coefficient of -0.297, presented a significant contribution in predicting the anger of individuals with SAD. In other words, impulsivity directly and risk perception inversely predicted the rate of anger in individuals with SAD.

4. Discussion

The main hypothesis of the present research was that the rate of anger in individuals with SAD is predicted based on the extent of their impulsivity and risk perception. Data analysis also revealed that impulsivity and risk

Table 1. Mean±SD scores and correlations between anger, impulsivity, and risk perception in the study participants

Variables	Mean±SD	Correlations		
	Descriptive Indices	1	2	3
Anger	65.40±9.30	1		
Impulsivity	58.82±8.20	0.53**	1	
Risk perception	19.35±4.81	-0.45**	0.36**	1

** $P<0.01$.

Table 2. Model summary and coefficients of predicting the anger based on impulsivity and risk perception

Model	B	SE	Beta	t	Sig.	R	R ²	F _{2,121}	Sig.
Constant	48.293	1.436		20.29	0.000				
Anger									
Impulsivity	0.480	0.089	0.423	5.41	0.000	0.60	0.36	33.70	0.000
Risk perception	-0.575	0.151	-0.297	-3.81	0.000				

perception can significantly predict anger in these individuals. Impulsivity directly predicted the level of their anger. In other words, with increasing the rate of impulsivity, the degree of their anger will be increased. Risk perception also inversely predicted the level of their anger. In other words, the more individuals with SAD encounter higher risk perception, the less they are involved in hostile and aggressive behaviors.

The finding related to the role of impulsivity in the level of anger in individuals with SAD was consistent with the theory that a subset of individuals with SAD are impulsive and aggressive and deviate from the prototype of this disorder (Kashdan & McKnight, 2010). This finding was consistent with the view that socially-anxious individuals with atypical anxious-impulsive patterns manifest approach-based impulsive and aggressive behaviors (Kashdan et al., 2008). Various research results (Kashdan et al., 2009; Kashdan & Collins, 2010; Dixon et al., 2017) were also in line with this finding. This result can be explained through several approaches, considering the basic theoretical investigations. One of these explanations is that individuals with SAD are more prone to consider ambiguous reactions of others negatively; their negative interpretation bias provides evidence of rejection and non-acceptance. This, in turn, makes them feel more anxious and nervous. For some populations, such a situation becomes a tendency to impair the perpetrators of this state, and even for fewer numbers of them to act aggressively toward others. Accordingly, anger and aggression will ultimately be a retaliatory response to their rejection and non-acceptance. Apparently, by presenting anger and aggression, they can express their dominance, earn acceptance and respect, and prevent a loss in social status from unexpected acts of rejection by others (Leary et al., 2006). Considering impulsivity elements, which in some studies (Lecrubier et al., 1995) include characteristics, such as irritability, patience-impatience, the time needed for decision making, aggression, response control, capacity for delay, etc., it can be explained that the problems associated with each element of impulsivity can exacerbate the rate of anger in individuals with SAD. Therefore, a history of irritability and aggression, impatience, and deficits in decision-making speed, the ability to control responses, and capacity for delaying in impulsive socially anxious individuals, can facilitate and exacerbate their anger in such situations. These explanations indicate that anger may exist in some individuals with SAD and be facilitated by impulsivity. Accordingly, impulsivity may disinhibit some emotions and behaviors in individuals with SAD, including anger and aggression that results in further anger in this population. Other scholars (Lecrubier et al., 1995; Kashdan et al., 2008; Kashdan et al., 2009; Kashdan & Collins, 2010) also supported these explanations.

Another result of this research based on the impact of risk perception in the extent of anger in individuals with SAD was also consistent with several studies (She et al., 2017). The more the risk perception in individuals with SAD, the less the risky behaviors, such as aggression and even anger, in them. This is to some extent consistent with previous studies where novelty seeking and high risk-taking in individuals with SAD were associated with impulsivity and anger (Cloninger et al., 1994; quoted by Meortberg et al., 2014), as well as other studies (Kashdan & Hofmann, 2008; Kashdan et al., 2008). This result may be explained by the fact that the major relevant issue is the risk-taking level of individuals; it may somewhat be resulting from the level of their risk perception. The level of risk-taking is high in impulsive and aggressive individuals with SAD; this may explain their angry and aggressive behaviors. However, individuals with SAD experience higher risk perception and lower risk-taking; thus, they consider inappropriate social and emotional behaviors, such as anger and hostility as harmful and negative consequences to themselves, and will less likely manifest these behaviors. For example, although it has been argued that some individuals with SAD are sensitive to the ambiguous behaviors of others and are prone to present retaliatory reactions, such as anger and aggression against rejection and non-acceptance (Leary et al., 2006); however, if they consider such behaviors dangerous and harmful to their future social relationships, or understand that representing such behaviors by them may be accompanied by the risk of more negative and more rejecting behaviors by others, they will show less anger and hostility in such conditions. This explanation was consistent with other results (such as She et al., 2018; Kashdan & Hofmann, 2008; Kashdan et al., 2008) that explained how risk-taking or risk perception is associated with anger in individuals with SAD.

Another explanation that seems to be rational about the role of risk perception in the anger of individuals with SAD refers to a possible relationship between risk perception and impulsivity and that impulsivity is also a significant predictor of anger in these individuals. The present study data revealed that risk perception inversely predicts impulsivity. Thus, the higher the risk perception, the lower the impulsivity, and vice versa. Impulsivity was also associated with anger in individuals with SAD; therefore, in addition to the inverse correlation between risk perception and the rate of anger in these individuals (without an intermediary), it plays an indirect role in the anger of socially-anxious individuals by reducing impulsivity (which, in turn, reduces their anger). However, such an explanation has been proposed with caution. Perhaps it would be better to present a serious explanation after conducting

causal studies, or at least path analysis studies; considering other important variables that might affect such relationships is also suggested. However, the presented general explanations indicated that according to the atypical pattern of anxious-impulsive SAD, the anger in individuals with SAD is probably facilitated by impulsivity and risk perception. Impulsivity may disinhibit manifesting anger by irritability background, a deficit in decision-making speed, disability in response control, and so on. In the same way, the low level of risk perception in socially-anxious subjects may result in disregarding the negative consequences of rejecting emotions, like anger. Thus, anger in individuals with SAD is correlated with these variables.

Although there were limited data and theoretical perspectives, especially on the relationship between risk perception and anger in SAD, there exist several clinical benefits concerning the present study results. It seems that considering the level of risk perception and impulsivity in individuals with SAD leads to better diagnosis and treatment of them, especially for further reducing their anger. Based on the atypical anxious-impulsive pattern of SAD, risk-taking and impulsive individuals with SAD may less attempt to seek treatment, and may not well benefit from existing interventions. Accordingly, accurate diagnosis and better treatment of these individuals is necessary concerning modifying their risk perception and impulsivity. In this condition, the usual treatment will be more effective for them.

A main limitation of the present research was difficulty in controlling all confounding variables and separating their role from the predictor variables. Therefore, it is suggested that future research explore the relationship between these variables with more control and more accurate causal studies.

5. Conclusion

Risk perception and impulsivity are essential variables in predicting anger in individuals with SAD. Thus, it is necessary to pay serious attention to these variables for understanding and treating individuals with SAD and their anger.

Ethical Considerations

Compliance with ethical guidelines

This research has considered all ethical principles. The ethical principles of this study were expressing the general purpose of the research to the study participants, voluntary participation in research, and having the right to discontinuing the study as desired, as well as assuring the study participants about the confidentiality of their provided information.

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Authors' contributions

Conceptualization, investigation, funding acquisition, methodology, and analysis: Tooraj Sepahvand; Writing—original draft, writing—review & editing: Tooraj Sepahvand & Khalil Karami.

Conflict of interest

The authors declared no conflicts of interest.

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