



Rejection sensitivity in severe alcohol use disorder: Increased anxious anticipation of rejection

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ABSTRACT

Rejection sensitivity (RS) reflects the disposition to anxiously expect, readily perceive, and disproportionately react to rejection. It is linked to interpersonal problems and psychopathological symptoms, which are frequent in severe alcohol use disorder (SAUD) and are known to influence clinical outcomes. Consequently, RS has been put forward as a process of interest in this disorder. However, empirical studies investigating RS in SAUD are scarce and focused on its last two components, leaving the core process of anxious expectations of rejection unexplored. To fill this gap, 105 patients with SAUD and 73 age-and-gender-matched controls completed the validated Adult Rejection Sensitivity Scale. We computed anxious anticipation (AA), and rejection expectancy (RE) scores, corresponding to the affective and cognitive dimensions of anxious expectations of rejection, respectively. Participants also completed measures of interpersonal problems and psychopathological symptoms. We found that patients with SAUD had higher AA (affective dimension) but not RE (cognitive dimension) scores. Moreover, AA was associated with interpersonal problems as well as psychopathological symptoms in the SAUD sample. These findings meaningfully extend the RS and social cognition literatures in SAUD by showing that difficulties already arise at the anticipatory stage of socio-affective information processing. Moreover, they shed light on the affective component of anxious expectations of rejection as a novel, clinically relevant process in this disorder.

1. Introduction

Rejection sensitivity (RS) is the tendency to anxiously expect, biasedly perceive, and disproportionately react to, rejection signals (Downey and Feldman, 1996). Theory posits that high RS individuals, in an excessive attempt to prevent rejection or as a result of exaggerated rejection perceptions in equivocal interactions, adopt maladaptive behaviours (e.g., avoidance, detachment, hostility, submissiveness). These behaviors paradoxically favor the undesired outcome, deteriorate relationships, and ultimately affect mental health (Ayduk and Gyurak, 2008; Downey and Feldman, 1996; Romero-Canyas et al., 2010). Supporting this view, empirical studies have established consistent cross-sectional and longitudinal associations between RS, interpersonal problems (Cain et al., 2017; London et al., 2007; Meehan et al., 2018) and psychopathological symptoms (Gao et al., 2017). Heightened RS thus constitutes a critical process in the maintenance of psychiatric disorders through social impairments and distress (Hsu and Jarcho, 2021; Reinhard et al., 2019). However, investigations of RS in clinically diagnosed individuals are scarce (Gao et al., 2017).

The study of RS is particularly warranted in patients with addiction, and notably severe alcohol use disorder (SAUD; Leach and Kranzler, 2013). Indeed, healthy relationships and social support are linked with sustained recovery whereas interpersonal conflicts, exclusion, and the ensuing internalized symptoms constitute major relapse predictors in SAUD (Slidrecht et al., 2019; Zywiak et al., 2003). Identifying the cognitive-affective mechanisms underpinning social difficulties in SAUD thus holds considerable promise for improving clinical outcomes. At the intra-individual level, heightened RS is one likely candidate as patients with SAUD face frequent social rejection (e.g., stigma and dehumanization; Fontesse et al., 2020; Schomerus et al., 2011), which is a key determinant of RS (London et al., 2007). Despite these considerations, direct empirical evidence pertaining to the presence and extent of heightened RS in patients with SAUD is limited.

Preliminary work supports increases in two RS components, namely biased perceptions of, and disproportionate reactions to, rejection: patients with SAUD show hostility biases in emotion recognition (Freeman et al., 2018) and intention attribution (Pabst et al., 2020), and exhibit increased brain activations following social exclusion (Maurage et al.,

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2012). It is unknown, however, whether SAUD is associated with anxious expectations of rejection, representing the core and driving component on the basis of which the RS processing style unfolds (Ayduk and Gyurak, 2008; Downey and Feldman, 1996; Romero-Canyas et al., 2010).

To fill this gap, we primarily investigated if patients with SAUD display heightened anxious rejection expectations using the validated Adult Rejection Sensitivity Questionnaire (ARSQ; Berenson et al., 2009; French validation: Lafait and Philippot, 2023). The ARSQ assesses the level of anxiety and estimated probability of rejection of participants immersed in a series of imagined social situations. Although anxious expectations are typically assessed as a unitary construct, recent factor analytical, correlational, and clinical case-control studies, demonstrated that the cognitive (Rejection expectancy; RE) and affective (Anxious Anticipation; AA) components are distinct (Innamorati et al., 2014; Lord et al., 2022; Preti et al., 2020; Rosenbach et al., 2021). This distinction is relevant to SAUD, where growing research suggests a dissociation between normal cognitive, but impaired affective processing of social information (Maurage et al., 2016; Maurage et al., 2011; Maurage et al., 2011). We therefore considered AA and RE distinctively to obtain a more precise, process-based, and clinically informative understanding of RS in SAUD. Secondly, as a first step toward the investigation of RS as a process involved in SAUD-related social difficulties and psychopathological symptoms, we explored associations between anxious rejection expectations on the one hand, and interpersonal problems, depression, anxiety, and social anxiety on the other hand, in SAUD. We selected these variables as they constitute likely consequences of RS as well as frequent comorbidities in SAUD, where they contribute to the maintenance of the disorder (Gao et al., 2017; Grant et al., 2015; Helle et al., 2020; Johnson et al., 2022; London et al., 2007; Meehan et al., 2018; Sliedrecht et al., 2019; Zywiak et al., 2003). Finally, we examined the specificity of the RS-SAUD link by exploring the potential confounding role of the aforementioned psychopathological symptoms (Gao et al., 2017).

2. Method

2.1. Participants

We recruited 105 inpatients (48 women) with a DSM-5 SAUD diagnosis from Belgian detoxification centers, and 73 healthy controls (HC, 31 women), group-matched for age and gender. A trained psychiatrist interviewed patients prior to admission to ensure that SAUD was their primary problem and that they did not present a concomitant psychiatric/neurological disorder necessitating preliminary treatment or interfering with detoxification. We then included patients in the study if they reported having never received a diagnosis of or treatment for psychiatric or neurological disorders other than depression, anxiety, or tobacco use disorder. Patients had abstained from alcohol for at least 10 days at testing time. HC had no history of psychiatric disorders (except tobacco use disorder), no family history of SAUD, reported drinking on average less than 10 units/week and less than 3 units/day, and had an Alcohol Use Disorder Identification Test (AUDIT; Babor et al., 2001) score below 8. All participants were fluent in French and presented no polysubstance abuse or major medical/neurological disorders. This study was approved by the ethical board of the local medical University and complied with the Declaration of Helsinki. All participants provided informed written consent.

2.2. Rejection sensitivity assessment: anxious expectations of rejection

The ARSQ comprises 9 written statements depicting dyadic interactions with a rejection possibility (e.g., “You ask your supervisor about a problem you have been having at work”). For each statement, participants rate on 6-point Likert scales (1 = “Not at all” to 6 = “Very much”) how anxious they would feel and the extent to which they would

expect the other to show acceptance. We computed AA and RE scores, by averaging anxiety and inverted acceptance expectancy ratings, respectively. Higher scores indicate more AA/RE. Cronbach's α s were 0.76 (SAUD) and 0.86 (HC) for AA, 0.68 (SAUD) and 0.78 (HC) for RE.

2.3. Interpersonal problems and psychopathological symptoms

We assessed social interaction difficulties with the 8 subscales of the 64-item Inventory of Interpersonal Problems (IIP; Horowitz et al., 2003): Cold/Distant (e.g., “It is hard for me to show affection to others”), Domineering (e.g., “It is hard for me to receive orders”), Intrusive/Needy (e.g., “It is hard for me to stay out of people's business”), Overly accommodating (e.g., “I am too easily exploited by others”), Nonassertive (e.g., “It is hard for me to assert myself to others”), Self-sacrificing (e.g., “I am excessively generous with others”), Socially inhibited (e.g., “It is hard for me to introduce myself to new people”), and Self-centered (e.g., “It is hard for me to support others in their life projects”). Each item's personal relevance is rated on a 5-point Likert scale (from 0 = “Not at all” to 4 = “Extremely”) and scores are summed within subscales.

We assessed depression symptoms with the 13-item Beck Depression Inventory (BDI; Beck and Steer, 1987), trait anxiety symptoms with the trait form of the State-Trait Anxiety Inventory (STAI; Spielberger and Gorsuch, 1983), and social anxiety symptoms with the Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987).

2.4. Data analysis

We performed analyses on R (R Core Team, 2019) using “afex” (Singmann et al., 2021) and “emmeans” (Lenth et al., 2021) packages. Patients with SAUD had less completed education years than HC, and education was associated with AA scores in SAUD ($r = 0.19$, $p = 0.056$) and RE in HC ($r = -0.31$, $p = 0.008$). Therefore, we analyzed RS scores using a 2 (Group: SAUD vs HC, between) $\times$ 2 (Subscale: AA vs RE, within) repeated measures ANCOVA with education as covariate.¹ We explored associations between RS scores differing between groups and interpersonal problems, as well as psychopathology symptoms within the SAUD sample using Pearson correlations, and used the Benjamini and Hochberg (1995) method to hold the false discovery rate at $Q = 0.05$. Finally, we investigated the confounding effect of psychopathology symptoms on group differences in relevant RS scores by individually including BDI, STAI, and LSAS scores, as covariates in ANCOVAs. There were no outliers (absolute Z-score > 3.29 ; Tabachnick and Fidell, 2012) in either group for either subscale. Histograms and absolute skewness values (all < 0.84) indicated no major normality assumption violation.

3. Results

3.1. Sample characteristics (Table 1)

Groups did not differ regarding age or gender but patients with SAUD had fewer education years. Patients with SAUD also reported higher scores on every interpersonal problems subscale, as well as on depression, trait anxiety, social anxiety, and AUDIT measures.

3.2. Rejection sensitivity: Anxious expectations (Fig. 1)

We found main effects of Group [$F(1,174) = 15.84$, $p = 0.0001$, $\eta_p^2 =$

¹ As illustrated in the correlation pattern, education interacted with group and subscale to predict RS scores. Therefore, we included the education by group and the education by subscale interaction terms in the main model investigating the effect of group and subscale on RS scores. We also included the education by group interaction term in the follow-up models investigating the effect of group on scores of each subscale independently.

Table 1

Sample characteristics regarding sociodemographic variables, interpersonal problems, psychopathological symptoms, alcohol consumption and SAUD-related variables.

	SAUD (N = 105)	HC (N = 73)	t/χ^2	p-value
Sociodemographic variables				
Age	48.31 (10.32)	48.33 (10.92)	0.01	0.99
Gender [N of females (%)]	48 (46%)	31 (42%)	0.08	0.78
Education	13.95 (2.47)	15.42 (2.39)	3.99	<.001
Interpersonal problems				
Cold/Distant	9.82 (6.57) ¹	5.31 (5.10) ¹	5.13	<.001
Domineering	7.81 (4.41) ¹	4.94 (3.37) ¹	4.87	<.001
Intrusive/Needy	12.23 (6.38) ¹	5.40 (4.22) ¹	8.54	<.001
Overly accommodating	14.69 (6.85) ¹	10.92 (6.19) ¹	3.81	<.001
Nonassertive	14.64 (7.98) ¹	9.40 (7.76) ¹	4.35	<.001
Self-Sacrificing	14.25 (6.65) ¹	11.21 (6.44) ¹	6.03	<.001
Socially inhibited	11.66 (7.48) ¹	7.21 (6.52) ¹	4.19	<.001
Self-centered	9.66 (5.26) ¹	5.43 (4.11) ¹	5.98	<.001
Psychopathological symptoms				
Depression	9.91 (6.51) ¹	2.54 (2.95) ¹	10.13	<.001
Anxiety	51.63 (10.40)	35.85 (10.20) ¹	10.03	<.001
Social Anxiety	50.78 (26.50) ⁵	33.89 (24.91) ¹	4.27	<.001
Alcohol consumption and SAUD-related variables				
Units/day before detoxification	17.53 (10.62) ³	/	/	/
SAUD duration	10.46 (9.79)	/	/	/
Number of previous detoxifications	1.87 (2.85)	/	/	/
AUDIT	30.99 (6.07) ⁵	2.94 (1.86)	43.51	<.001

Note: The superordinate numbers indicate the number of missing observations.

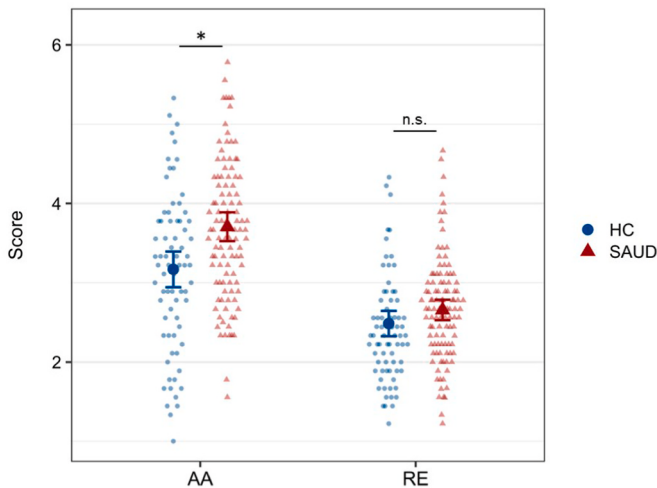


Fig. 1. Anxious anticipation (AA) and Rejection expectancy (RE) scores in patients with SAUD (SAUD) and healthy controls (HC).

0.08], with higher scores in SAUD ($M_{\text{Education-Adjusted (EA)}} = 3.18$, $SE = 0.07$) than in HC ($M_{\text{EA}} = 2.83$, $SE = 0.06$), and Subscale [$F(1,174) = 91.59$, $p < 0.0001$, $\eta_p^2 = 0.34$], with higher AA ($M_{\text{EA}} = 3.44$, $SE = 0.07$) compared to RE scores ($M_{\text{EA}} = 2.57$, $SE = 0.05$). The Group by Subscale interaction was significant [$F(1,174) = 4.10$, $p = 0.045$, $\eta_p^2 = 0.02$]. Follow-up ANCOVAs for each subscale with Group as between subject factor and Education as covariate indicated that groups differed on AA

[$F(1,174) = 13.50$, $p = 0.0003$, $\eta_p^2 = 0.07$], with higher scores for SAUD ($M_{\text{EA}} = 3.71$, $SE = 0.09$) than HC ($M_{\text{EA}} = 3.17$, $SE = 0.11$), but not on RE [$F(1,174) = 2.72$, $p = 0.101$, $\eta_p^2 = 0.02$; SAUD: $M_{\text{EA}} = 2.66$, $SE = 0.07$, HC: $M_{\text{EA}} = 2.48$, $SE = 0.08$]. Subsequent analyses thus focused on AA.

3.3. Associations with interpersonal problems and psychopathological symptoms in SAUD (Table 2)

AA was positively associated with the Self-centered, Socially inhibited, Nonassertive, Overly accommodating, Self-sacrificing, and Intrusive/Needy subscales. AA was also positively associated with depression, trait anxiety, and social anxiety. All correlations remained significant after Benjamini-Hochberg adjustment.

Finally, models investigating the confounding effect of psychopathology symptoms (along with education) revealed that although the group effect on AA remained significant after controlling for social anxiety ($p = 0.045$), it became non-significant after controlling for depression ($p = 0.680$) and STAI ($p = 0.564$).

4. Discussion

We assessed affective (AA) and cognitive (RE) dimensions of anxious rejection expectations, the core component of RS, in patients with SAUD and HC. We primarily found elevated AA, but not elevated RE in SAUD. Patients thus display heightened anxious anticipations of situations entailing the mere possibility of rejection but do not overestimate the probability of being actually rejected.

At a fundamental level, this finding corroborates previous studies highlighting the dissociation of cognitive and affective components of anxious expectations of rejection (Innamorati et al., 2014; Lord et al., 2022; Preti et al., 2020; Rosenbach et al., 2021) by showing their differential sensitivity to psychiatric diagnosis for the first time in an adult sample. Future clinical studies should hence consider them separately and clarify their distinct contributions. It also reinforces the trans-diagnostic relevance of this RS component by documenting alterations in a novel clinical group (Hsu and Jarcho, 2021).

For SAUD specifically, our results strengthen past evidence of specific alterations in affective, not cognitive, social information processing (Maurage et al., 2011a,b, 2016). They also extend the RS and, more generally, the social cognition literatures in SAUD by suggesting that difficulties are not restricted to the online processing of, and reactions to negative social signals, but also arise at the anticipatory stage. Since the RS framework considers anxious expectations as the causal starting point of a cascade of social processing and behavior modifications (Downey and Feldman, 1996; Romero-Canyas et al., 2010), and considering empirical evidence supporting an active role of RS in interpersonal problems and psychopathological symptoms (Cain et al., 2017; Gao et al., 2017; London et al., 2007; Meehan et al., 2018), AA may represent a novel, actionable and heuristic target to improve social functioning and clinical outcomes in patients with SAUD [e.g., using

Table 2

Correlations between AA and psychopathological symptoms and interpersonal problems in the SAUD sample.

	r	p	N
Depression	.405	<.001	105
Anxiety	.413	<.001	105
Social Anxiety	.386	<.001	100
Interpersonal problems			
Cold/Distant	.116	0.24	103
Domineering	.110	0.27	103
Intrusive needy	.210	0.03	103
Overly accommodating	.321	<.001	103
Nonassertive	.389	<.001	103
Self-sacrificing	.271	0.005	103
Socially inhibited	.208	0.03	103
Self-centered	.282	0.004	103

mindfulness approaches (Joss et al., 2020; Peters et al., 2016)].

Replicating studies in healthy samples, we also evidenced positive associations between AA and interpersonal problems related to social disinvestment and inconsiderateness (self-centeredness), social inhibition, neediness, and self-silencing (non-assertiveness, over-accommodation, self-sacrificing) (Cain et al., 2017; Meehan et al., 2018). Beyond supporting the validity of ARSQ-derived AA scores in patients with SAUD, these findings suggest two concrete ways through which AA may contribute to disorder maintenance and relapse (Pabst et al., 2020a,b): AA may promote behaviors generating conflicts, isolation, and interpersonal distress, but also dissuade patients from resorting to social resources when facing stressors, or lead them to accommodate others at the detriment of important goals (e.g., accept drinking solicitations), to prevent rejection.

Again consistent with previous literature denoting a role of RS in psychopathology (Gao et al., 2017), AA was associated with internalized symptoms in SAUD. Furthermore, controlling for depression and anxiety eliminated the group differences. This suggests that heightened AA, rather than being specifically substance-induced, may primarily be a marker of patient's internalized symptoms. Importantly, however, this should not be mistakenly interpreted as evidence that heightened AA has no direct pertinence to patients with SAUD. Indeed, clinical or subclinical internalized symptoms are highly prevalent in SAUD and hence frequently form an integral part of the disorder (Grant et al., 2015; Helle et al., 2020; Johnson et al., 2022). Additionally, the above-described consequences of AA have relevance to SAUD regardless of their precise origin. These results thus hold value for identifying patients at increased risk of heightened AA.

Limitations must be acknowledged. First, although our stringent inclusion criteria make it unlikely that HC presented an alcohol use disorder, they did not undergo a formal diagnostic assessment. Second, we primarily discussed the links between AA, interpersonal problems, and psychopathological symptoms in terms of AA-driven effects. While this is consistent with theory and previous evidence, effects in the opposite direction are also plausible. More generally, our cross-sectional design precludes definitive causal inferences and longitudinal studies are required to clarify the likely complex and bidirectional relationships between SAUD, heightened AA, interpersonal problems and psychopathological symptoms, as well as to investigate the link between RS and prospective clinical outcomes (Leach and Kranzler, 2013). Other psychological variables (e.g., ruminations), not measured in our experimental design, might also intervene in these relationships. Third, we relied on ANCOVA to examine the confounding effect of psychopathology symptoms on the observed group difference. This may be problematic as such symptoms likely account for substantial “true” SAUD variance (Miller and Chapman, 2001).

In conclusion, we broaden the RS literature in SAUD by providing novel evidence that patients with SAUD exhibit heightened AA. These findings draw attention to a precise RS component as a novel actionable process that may participate in SAUD severity and persistence, and hence serve as a target. They also provide a basis for future studies to prospectively investigate the role of AA and other RS components in social functioning and relapse in SAUD. Another promising avenue would be to extend the study of RS to 1) subclinical populations (e.g., binge or heavy drinkers) to determine whether RS constitutes a risk factor for SAUD, and 2) non-treatment seeking individuals with SAUD, where RS may contribute to delayed access to care, consistent with possible rejection (or stigma) being an important treatment barrier (Probst et al., 2015).

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Authors contribution

All authors contributed to draft the study design. AP created the stimuli and paradigm. AP, PB and MG recruited the participants and collected the data. AP, PB, MG and PM conducted the statistical analyses. AP drafted the manuscript and all authors provided critical revisions for important intellectual content. The final version of the manuscript was also approved by all authors.

Declaration of competing interest

The authors declare no conflict of interest.

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