



Temperamental differences between adolescents and young adults with or without an eating disorder

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Abstract

Objective: There is an increasing interest into the role of temperament, and more specifically the traits Sensitivity to Punishment (SP) and Sensitivity to Reward (SR), in the occurrence of eating disorder (ED) symptoms. However, the results on this topic are inconsistent, different instruments are used to measure SP and SR and there is a lack of research on adolescents and young adults, although they form a group at risk to develop an ED. Therefore, the present objective was to study personality profiles co-occurring with specific EDs in adolescents and young adults.

Method: The present study examined the levels of SP and SR for different ED-diagnoses, namely Anorexia Nervosa of the Restricting type (AN-R; $n = 41$), Anorexia Nervosa of the Binge/Purge type (AN-B/P; $n = 20$) and Bulimia Nervosa (BN; $n = 30$), and compared these with a Healthy Control group (HC; $n = 292$). SP and SR were measured by three different temperament questionnaires in order to rule out instrument-specific findings. Only female participants between the age of 14 and 25 years were included.

Results: SP was transdiagnostically increased compared to HCs, whereas SR was lower in AN-R patients compared to BN patients. These results were independent of the questionnaire being used.

Discussion: Further research is necessary to explain how these traits may influence specific ED-symptoms.

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1. Introduction

Eating disorders (EDs) are detrimental conditions that often develop during adolescence and have negative consequences on a variety of psychosocial and physical domains in adult life [1]. Although several studies have been conducted to examine risk and maintaining factors for EDs (e.g. [2]), especially for Anorexia Nervosa of the Restricting Type (AN-R), Anorexia Nervosa of the Binge/Purge Type (AN-B/P) and Bulimia Nervosa (BN) [3], many questions regarding the aetiology of EDs are still unanswered. It remains unclear why some people can hardly resist the omnipresence of high caloric fast-food in western communities, while people with AN-R seem to have it easier resisting these types of food than eating them. Moreover,

while AN and BN are seen as different behavioural outcomes of the same underlying process according to the Transdiagnostic Model of EDs [2], the question remains why AN patients are able to maintain a highly restrictive eating pattern, while BN patients seem to be swinging back and forth between restriction and binges. In other words, the determinants of individual reactions to our food environment are not clear yet.

Part of the explanation might be found in interindividual differences in temperament. More specifically, it seems that ED-patients have different personality-profiles compared to healthy controls (HCs), with some traits being related to EDs in general and some to specific ED-diagnoses [4–6]. Most research in this area relies on two related personality theories, namely the Reinforcement Sensitivity Theory (RST; [7–10]) and Cloninger's model of personality [11].

In its original version, the RST postulates that behaviour is governed by three biological systems, namely the Behavioural Activation System (BAS), the Behavioural Inhibition System (BIS) and the Fight–Flight System (FFS). The BAS is activated in response to conditioned

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appealing stimuli and leads to approach behaviour. The BIS responds to signals of punishment, frustrating non-reward and novelty and inhibits ongoing behaviour. The FFS responds to the presence of unconditioned aversive stimuli and leads to defensive aggression (fight) or escape behaviour (flight) [7–9]. The traits Sensitivity to Punishment (SP) and Sensitivity to Reward (SR) are derived from this theory and refer to interindividual differences in the sensitivity of the BIS and the BAS respectively.

However, in 2000 the RST was revised [10] and several modifications were made. First, the distinction between conditioned and unconditioned stimuli disappeared and as such, the BAS is now assumed to be activated by both conditioned and unconditioned signals of reward. In the revised RST, the BIS no longer functions as a pure punishment system, but is conceptualised as a conflict detection and resolution system. It is activated by goal-conflict and leads to inhibition of behaviour. Concerning the FFS, the freeze-response was added and accordingly the name of this third system was changed into the Fight–Flight–Freeze System (FFFS). It is thought to be activated by signals of punishment and to lead to aggressive or escape behaviour.

These conceptual changes have implications for the way SP and SR are defined. More specifically, SR is still considered to reflect the sensitivity of the BAS, but the association between SP and the BIS seems to be replaced by an association between SP and the FFFS. However, the distinction between the BIS and the FFFS appears to be very hard to make using self-report questionnaires [12]. Moreover, both the conflict associated with the BIS as well as the pure punishment associated with the FFFS can be seen as forms of punishment. Therefore, it is assumed that the concept of SP reflects both BIS- and FFFS-sensitivity (e.g. [5,13]).

The second theory, Cloninger's model of personality [11,41], is based on the RST and contains four innate temperament dimensions and three acquired character dimensions. Especially the temperament dimensions Harm Avoidance (HA) and Novelty Seeking (NS) are important for the present objectives. More specifically, HA is defined as the tendency of inhibiting responses in the face of aversive stimuli, leading to the avoidance of punishment and non-reward. NS is defined as the tendency to respond actively to novel stimuli, leading to reward and escape from punishment. These two temperament dimensions form the two major dimensions responsible for behavioural inhibition and activation in this model and are as such theoretically related to the RST concepts [41]. Therefore, associations between these traits and the traits SP and SR from the RST are often made (e.g. [5]) and are empirically confirmed [42]. Unfortunately, this also means that the concepts SP/HA and SR/NS are often used interchangeably (e.g. [5]), which has added to the inconsistent operationalisation of SP and SR as well as to the inconsistent findings regarding SP and SR in the ED-domain (e.g. [5]). Therefore, questionnaires based on

both models were used in the present study in order to test temperamental differences between EDs from the RST-perspective and from the perspective of Cloninger's model of personality.

As previously mentioned, an increasing amount of research focuses on the SP/HA and SR/NS dimensions to explain ED-symptoms within specific ED-diagnoses (e.g. [5]). The rationale behind this is that people scoring high on SR will be more sensitive to food and thus show more binge eating compared to people scoring lower on SR (e.g. [14]). This implies that the level of SR might differ between ED-diagnoses (e.g. [5]). On the other hand, for all ED-patients, eating seems to become punishing instead of rewarding from a cognitive and emotional point of view and patients suffering from AN-R seem to overcome the biological need to eat on top of that [15]. This leads to the hypothesis that SP/HA is higher in all EDs compared to HCs, whereas SR/NS is hypothesised to be decreased in AN-R patients and to be increased in AN-B/P and BN patients [5]. These differences in temperament may explain why AN-R patients are able to maintain their restrictive eating pattern, namely by the combination of high SP/HA leading to inhibition and avoidance, and low SR/NS, hence less sensitivity for the rewarding effects of food. AN-B/P and BN-patients on the other hand show both the avoidance behaviour seen in AN-R, which probably resembles high SP/HA, but they also show binge/purge behaviour which might be explained by high SR/NS leading to more impulsive behaviour and to more sensitivity to the rewards of food as well [15].

In line with these hypotheses, a review of Harrison et al. [5] showed that ED-patients scored higher on traits related to inhibition and avoidance than HCs, regardless of their specific ED-diagnosis, whereas traits related to approach behaviour discriminated between ED-diagnoses. More specifically, AN-R patients had lower scores on SR and NS compared to HCs, whereas AN-B/P and BN-patients showed higher scores on these traits. Another review from Cassin and von Ranson [4] showed that all ED-patients scored higher on HA compared to HCs, while NS was lower in AN-R patients and higher in BN patients.

However, Harrison et al. [5] found a high degree of inconsistency in the results, with several studies reporting opposite or insignificant findings. They argue that the inconsistent use of different measures of temperament as well as the lack of differentiation between AN-R and AN-B/P in several studies may contribute to the inconsistent evidence. Also the use of different age groups might add to the conflicting findings. More specifically, SR appears to be generally heightened during adolescence [43]. This means that differences found on this trait between ED-patients and HCs are not necessarily similar in adolescents or young adults as in adults. For example, a recent study on adolescents found increased instead of decreased SR in the AN-R group compared to HCs [15].

However, it should be noted that the majority of studies on temperament and EDs has focused on adults, whereas few

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