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Anomalous self-experiences (ASEs) are subjective disturbances in the experience of the self and are common among people with psychotic-spectrum disorders. Previous research has shown that ASEs are highly correlated but distinct from other aspects of schizotypal personality. The current study examined the nomological network of ASEs by examining their relations with self-esteem, self-concept clarity, self-consciousness, aberrant salience, dissociation, and Big 5 personality characteristics with and without removing shared variance with schizotypal personality. Using structural equation modeling, ASEs were shown to be associated with decreased self-concept clarity, global self-esteem, self-competence, and self-liking, but higher public and private self-consciousness. ASEs were also associated with increased aberrant salience, dissociation, and maladaptive personality traits including low agreeableness, conscientiousness, and extraversion but increased neuroticism. After removing shared variance with schizotypal personality, ASEs were still associated with self-concept clarity and self-esteem variables, but not with self-consciousness. The relations with aberrant salience, dissociation, and maladaptive personality remained significant (with the exception of extraversion). Cognitive-perceptual schizotypal personality displayed similar relations with self-processing, aberrant salience, dissociation, and maladaptive personality traits as anomalous self-experiences. However, after removing shared variance with anomalous self-experiences, cognitive-perceptual schizotypal personality was positively associated with self-esteem and not associated with self-consciousness or dissociation. Cognitive-perceptual schizotypy was positively associated with conscientiousness and extraversion, and negatively associated with neuroticism. Taken together, these results provide more support for the nomological network of ASEs and suggest that many of the observed relations between schizotypy and these variables may be driven by anomalous self-experiences.

Keywords: self-concept clarity, self-esteem, self-consciousness, self-disturbance, schizotypy

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Anomalous self-experiences (ASEs) are disturbances in the subjective and implicit experience of the self (Parnas & Handest, 2003; Sass & Parnas, 2003). Although not explicitly included in the International Classification of Diseases (ICD) or the Diagnostic and Statistical Manual of Mental Disorders (DSM), ASEs have a long history in psychiatry dating back to early theorists who

suggested that self-disturbances were central features of schizophrenia (Bleuler, 1911). Recent research has shown that ASEs are associated with the premorbid (Brent et al., 2014), prodromal (Nelson et al., 2013; Parnas et al., 2011; Schultze-Lutter et al., 2010), first episode (Haug et al., 2016; Møller et al., 2011), and chronic phases of schizophrenia (Klaunig et al., 2018). Thus, ASEs are increasingly being recognized as important features of psychosis-spectrum psychopathology that will help to understand the etiology, onset, and prognosis of schizophrenia (Sass, 2014).

ASEs have been shown to be highly correlated with, yet distinct from, positive symptoms of schizophrenia spectrum disorders such as delusions and hallucinations and negative symptoms such as anhedonia and avolition (Comparelli et al., 2016; Koren et al., 2016; Raballo & Parnas, 2012). Similar to schizophrenia, previous research has also found that schizotypal personality has a four-factor structure including cognitive-perceptual (e.g., magical ideation/perceptual aberration), interpersonal (e.g., social anhedonia/constricted affect), paranoid (e.g., suspiciousness/referential thinking), and disorganization (e.g., odd speech and behavior; Fonseca-Pedrero et al., 2018; Stefanis et al., 2004) components. In a recent study using a general population sample, we used confirmatory factor analysis to show that ASEs are distinct from these other aspects of schizotypal personality (Cicero et al., 2020). In this study, a five-factor model with ASEs as their own separate factor fit better than a series of four-factor models in which ASEs loaded with one of the four previously established factors of schizotypal personality. This provided strong evidence that ASEs are highly correlated but separate symptoms of schizotypal personality. The current research builds on previous work by examining the relations among these factors and self-concept clarity, self-esteem, self-consciousness, dissociation, aberrant salience, and Big 5 personality traits.

Self-disturbances have been conceptualized in several different ways, reflecting several different levels of experience and self-structure (e.g., Park & Nasrallah, 2014). The ipseity-disturbance model of self-disorders (Sass & Parnas, 2003) posits that these disturbances are related to minimal self (e.g., disturbances in the implicit experience of inhabiting one's

own body and affecting action), and hyper-reflexivity (e.g., an extremely exaggerated self-consciousness in which things normally experienced implicitly or nonconsciously require explicit attention). People with ASEs have disturbances in stream of consciousness (e.g., feeling like one's thoughts belong to someone else), self-awareness and presence (e.g., loss of basic or common sense), bodily experiences (e.g., the feeling that one is no longer in control of one's body), transitivism/demarcation (e.g., disturbances in one's ego boundaries), and existential reorientation (e.g., dramatic changes in one's worldview; Parnas et al., 2005).

ASEs may represent a lower cognitive level of self-disturbance, or a more "basic" level of processing (Haug et al., 2016). These disturbances may have consequences for higher level "narrative" self-processing in which the individual consciously reflects on the self (Lysaker & Lysaker, 2001). This narrative level of self-processing includes a variety of judgments about the self, including self-concept clarity, self-esteem, and self-consciousness. For example, ASEs may make it difficult for individuals to develop self-concept clarity, which can be defined as the extent to which an individual's views of the self are stable, consistent, and clearly defined (Campbell, 1990). Indeed, ASEs have been found to be negatively correlated with self-concept clarity both in self-report and task-based measures in general population (Cicero, Neis, et al., 2017) and schizophrenia samples (Klaunig et al., 2018; Svendsen et al., 2020). Thus, we expected to find that ASEs would be negatively associated with self-concept clarity, even after removing shared variance with cognitive-perceptual schizotypy.

In addition to self-concept clarity, ASEs may interfere with the development of self-esteem. There is preliminary support that ASEs are negatively associated with self-esteem in both clinical (Haug et al., 2016) and non-clinical samples (Cicero, Neis, et al., 2017). We expected to find that ASEs would be negatively associated with measures of self-esteem. Finally, hyper-reflexivity and awareness of features which are normally implicit (operative hyper-reflexivity), which can be defined as exaggerated self-consciousness, is central to the phenomenological conceptualization of ASEs. Preliminary research has found that self-consciousness is

indeed positively correlated with ASEs (Cicero, Neis, et al., 2017). Thus, we expected to find that ASEs would be positively associated with self-consciousness.

In addition to phenomenological similarities with schizotypal personality, there is considerable overlap between ASEs and depersonalization/dissociation (Sass et al., 2013). For example, the feeling of not being real is central to depersonalization disorder (Parnas et al., 2005), but could be viewed as an aspect of ASEs within this framework. Thus, we expected to find that ASEs would be associated with dissociation even after removing shared variance with schizotypal personality.

Aberrant salience is the unusual or incorrect assignment of significance or importance to otherwise innocuous stimuli, and has been hypothesized to be a driving force in psychosis (Kapur, 2003). Aberrant salience has been shown to be associated with cognitive-perceptual aspects of schizotypal personality, as well as with interpersonal, paranoid, and disorganized schizotypy to a lesser extent (Cicero et al., 2010; Raballo et al., 2019). Theorists have suggested that behavioral indicators of aberrant salience (e.g., attention and memory disturbances, failed suppression of attention to irrelevant stimuli, etc.) may manifest phenomenologically as ASEs such as hyper-reflexivity or disturbance of "common sense" among others (Nelson, Parnas, et al., 2014). Indeed, previous work has shown that aberrant salience is strongly associated with ASEs (Gaweda et al., 2019). Thus, we expected to find that aberrant salience would be associated with both cognitive-perceptual schizotypal personality and ASEs.

To our knowledge, the links between ASEs and Big 5 personality traits have not been examined directly. However, problems in self and interpersonal relationships are central features of personality disorders, and personality disorders have been linked to maladaptive personality traits (Berghuis et al., 2014). Criterion A of the alternative model for personality disorders in the DSM-5 refers to deficits in self-identity and self-direction (American Psychiatric Association, 2013). With respect to schizotypal personality disorder, these self-disturbances are described as distorted self-concept and confused boundaries between the self and others, which may be analogous to ASEs (Cicero et al., 2020).

Previous work has found that self-disturbances in borderline personality disorder are associated with neuroticism (Mullins-Sweatt et al., 2012). Thus, we expected to find that ASEs would be broadly associated with maladaptive personality traits and with neuroticism in particular.

Method

Participants

Participants were 748 undergraduates who provided informed consent and participated in exchange for partial completion of a course requirement. They were 69.3% female, 30.7% male, 30.6% East Asian, 23.9% White, 17.7% Southeast Asian, 11.6% multiracial, 9.7% Native Hawaiian or other Pacific Islander, 3.8% Hispanic, 1.2% African American, and 1.5% Other. Their mean age was 20.11 ($SD = 3.60$). Participants were not excluded for a history of psychopathology or substance use disorders because the goal of the current study was to generalize to general population samples, for which psychopathology and substance use disorders are common.

Materials

Anomalous Self-Experiences

ASEs were measured with the Inventory of Psychotic-Like Anomalous Self-Experiences (IPASE; Cicero, Neis, et al., 2017), a 57-item scale in which participants are asked how strongly they agree with statements on a scale of 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Previous research has found that the IPASE is highly correlated ($r = .92$) with the Examination of Anomalous Self-Experiences, which is the gold standard measure of ASEs (Nelson et al., 2019). The IPASE has been shown to have measurement invariance between sexes (Cicero, Neis, et al., 2017). The means, standard deviations, and internal consistency for the IPASE and all other measures in the current study can be found in Supplemental Table 1. The next measure of ASEs was the Self-Experience Lifetime Frequency Scale (SELF; Heering et al., 2016), a 12-item questionnaire in which participants answer how often they have had the experiences on a scale from 0 (*Never*) to 4 (*All the*

time). For each answer greater than 0, participants are asked how distressed they were by the experience on a scale from 0 (*Not Distressed*) to 4 (*Severely Distressed*). SELF scores have been reported to be higher in people with schizophrenia spectrum disorders than relatives and healthy controls (Heering et al., 2016).

Schizotypal Personality

The first measure of schizotypal personality was the Schizotypal Personality Questionnaire (SPQ; Raine, 1991). The SPQ includes 74 items on nine subscales in a yes/no format that was developed to measure DSM-III schizotypal personality disorder symptoms. These subscales include the Magical Ideation (SPQ-MI), Unusual Perceptual Experiences (SPQ-UBE), Constricted Affect (SPQ-CA), No Close Friends (SPQ-NCF), Odd Speech (SPQ-OS), Odd or Eccentric Behavior (SPQ-OEB), Suspiciousness (SPQ-S), Ideas of Reference (SPQ-IR), and Excessive Social Anxiety Scale (SPQ-ESA). The SPQ is one of the most commonly used measures of schizotypal personality. A long line of previous research suggests that the SPQ has a four-factor structure including cognitive-perceptual, interpersonal, paranoid, and disorganized factors (see Stefanis et al., 2004 for a review). The SPQ has been found to have metric invariance across age and between sexes (Tsaousis et al., 2015).

The measurement of cognitive-perceptual schizotypal personality was supplemented with the Brief Magical Ideation Scale (B-MIS; Winterstein et al., 2011), a 15-item true-false scale drawn from the full version of the Magical Ideation Scale. The Brief Perceptual Aberration Scale (B-PAS; Winterstein et al., 2011), a 15-item true-false scale drawn from the full length Perceptual Aberration Scale was also used. The measurement of interpersonal schizotypal personality was supplemented with the Brief Revised Social Anhedonia Scale (B-RSAS; Winterstein et al., 2011), a 15-item true-false questionnaire derived from the full-length Revised Social Anhedonia Scale. The RSAS measures a lack of interest in or pleasure from social interactions and relationships. Previous work on these scales has shown that they have high correlations with the full versions of the scales, which have extensive support for the reliability and validity of their scores in undergraduate, general population, and clinical

samples (Gross et al., 2012). The B-MIS, B-PAS, and B-RSAS have been shown to have measurement equivalence between gender, race, and ethnicity (Cicero et al., 2019; Winterstein et al., 2011).

Dissociation

The first measure of dissociation was the Dissociative Processes Scale (DPS; Harrison & Watson, 1992). The DPS was designed to measure relatively normal dissociative experiences as opposed to clinical dissociation. It contains 33 items on a scale from 1 (*Strongly Agree*) to 5 (*Strongly Disagree*). A second measure of dissociation was the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986). The DES includes 28 items for which participants circle a number to rate what percentage of time the item happens to them on a scale from 0% to 100% in 10% increments.

Self-Concept Clarity

Self-concept clarity was measured with the Self-Concept Clarity Scale (SCCS; Campbell, 1990). The SCCS is a 12-item scale on which participants rate statements on a scale from 1 (*Strongly Agree*) to 5 (*Strongly Disagree)*. The SCCS has been found to be correlated with other measures of self-concept clarity including agreement of pairs of adjectives describing the self. The SCCS has been shown to have measurement invariance between sexes and across race/ethnicity (Cicero, 2020).

Self-Esteem

Global self-esteem was measured with the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). The RSES includes 10-items on a Likert scale ranging from 1 (*Strongly Agree*) to 4 (*Strongly Disagree*). The Self-Liking/Self-Competence Scale (SLCS; Tafarodi & Swann, 1995) was used to measure self-liking and self-competence domains of global self-esteem. The SLSC is a 20-item questionnaire on which participants rate their agreement from 1 (*Strongly Disagree*) to 4 (*Strongly Agree*). Previous research has found that the SLSC is highly correlated with other measures of self-esteem (Tafarodi & Swann, 1995). The RSES has been shown to have measurement invariance between sexes and

across age (Tomas, et al., 2015; Whiteside-Mansell & Corwyn, 2003)

Self-Consciousness

Self-consciousness was measured with the Self-Consciousness Scale (SCS; Fenigstein et al., 1975), a 23-item true-false questionnaire designed to access self-awareness and self-focused attention. This scale is commonly used to measure self-consciousness in psychosis research (e.g., Combs & Penn, 2004; Lenzenweger et al., 1997).

Aberrant Salience

Aberrant salience was measured with the Aberrant Salience Inventory (ASI; Cicero et al., 2010), a 29-item yes-no questionnaire. The ASI has been shown to be correlated with other indices of dopamine functioning as well as with positive symptoms in people with schizophrenia and psychotic-like experiences in general population studies (e.g., McCutcheon et al., 2019). The ASI has been shown to have measurement invariance between sexes (Fernández-León et al., 2019)

Big 5 Personality

Big 5 personality characteristics were measured with the 50-item version of the International Personality Item Pool (IPIP; Goldberg et al., 2006). On the IPIP, participants are asked to indicate how much they agree with a series of statements on a scale from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). The IPIP has scales for openness to experience, conscientiousness, agreeableness, extraversion, and neuroticism. The IPIP has been shown to have measurement invariance across gender and race (Ehrhart et al., 2008).

Data Analysis

All data were analyzed using Mplus Version 8. Models were specified with a maximum likelihood extraction with robust standard errors (MLR), which is appropriate for continuous variables. In the same data set, the best fitting model was found to be a five-factor model with separate ASE, cognitive-perceptual, interpersonal, paranoid, and disorganized factors (Cicero et al., 2020). Thus, this model was used as a starting point. In this model, the ASE factor is composed of

the IPASE and SELF. The cognitive-perceptual factor includes the B-MIS, B-PAS, SPQ-MI, and SPQ-UPE. The Paranoid factor includes the SPQ-IR, SPQ-S, and SPQ-ESA. The Interpersonal factor includes the SPQ-NCF, SPQ-CA, and B-SAS. Finally, the Disorganized factor included the SPQ-OBE and the SPQ-OS.

All models were run in the same fashion. First, the putative dependent variables were regressed on each of factors separately (e.g., SCCS scores were regressed on the ASE factor, then on the cognitive-perceptual factor in a separate model, etc.). The results of these models can be interpreted as a standardized beta weight from a bivariate regression. Second, the putative dependent variables were regressed on all five factors simultaneously (e.g., SCCS scores were simultaneously regressed on ASE, cognitive-perceptual, interpersonal, paranoid, and disorganized schizotypal personality scores). Results of these analyses can be interpreted as beta weights from a simultaneous regression in which shared variance among all the factors is removed. Thus, results after removing shared variance represent unique associations that cannot be accounted for by shared variance among ASEs and schizotypal personality (see Figure 1).

Results

As can be seen in Table 1, ASEs and all four factors of schizotypal personality were negatively associated with self-concept clarity, self-competence, self-liking, global self-esteem, and positively associated with self-consciousness (both public and private), aberrant salience, and dissociation. However, after removing shared variance, ASEs remained negatively associated with self-concept clarity and self-esteem, but cognitive-perceptual schizotypy was positively associated with self-concept clarity and self-esteem (see Table 2). The interpersonal, disorganized, and paranoid factors were only associated with some aspects of self-concept clarity and self-esteem. Only paranoid and interpersonal schizotypal personality remained significantly associated with self-consciousness after removing shared variance. ASEs were still weakly associated with aberrant salience, but cognitive-perceptual schizotypal personality remained strongly associated with it. Finally, ASEs were still strongly associated with dissociation after removing shared variance with schizotypal

Figure 1

Self-Concept Clarity Simultaneously Regressed on Anomalous Self-Experience and Schizotypal Personality Traits
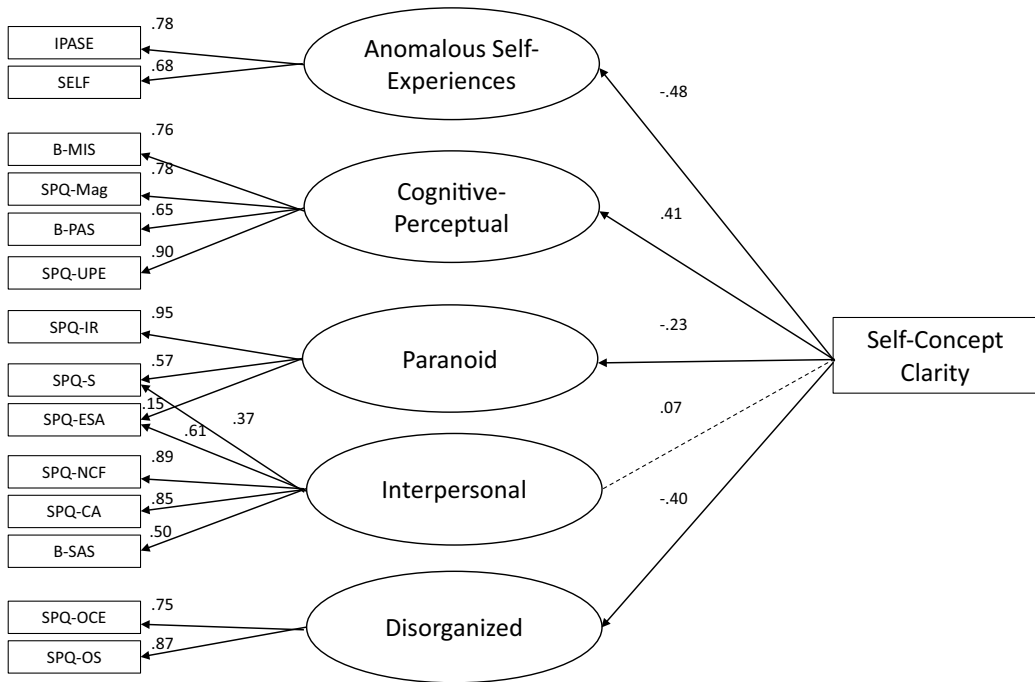
Note.   IPASE = Inventory of Psychotic-Like Anomalous Self-Experiences, SELF = Self-Experience Lifetime Frequency Scale Obliviousness Subscale, B-MIS = Brief Magical Ideation Scale, SPQ-Mag = Schizotypal Personality Questionnaire, Magical Ideation Subscale, B-PAS = Brief Perceptual Aberration Scale, B-SAS = Brief Social Anhedonia Scale, SPQ-IR = Schizotypal Personality Questionnaire Ideas of Reference Subscale, SPQ-S = Schizotypal Personality Questionnaire-Suspiciousness Subscale, SPQ-ESA = Schizotypal Personality Questionnaire Excessive Social Anxiety Subscale, SPQ-NCF = Schizotypal Personality Questionnaire- No Close Friends Subscale, SPQ-CA = Schizotypal Personality Questionnaire-Constricted Affect Subscale, SPQ-OEB = Schizotypal Personality Questionnaire Odd or Eccentric Behavior Subscale, SPQ-OS = Schizotypal Personality Questionnaire-Odd Speech Subscale, Self-Concept Clarity = Self-Concept Clarity Scale. Solid lines represent statistically significant paths. Dashed lines represent non-statistically significant paths.

personality, but cognitive-perceptual schizotypal personality was not.

As can be seen in Table 3, ASEs and the schizotypal personality factors were generally associated with maladaptive Big 5 personality traits including low agreeableness, conscientiousness, and extraversion, but high neuroticism. After removing shared variance (Table 4), ASEs remained negatively associated with agreeableness, conscientiousness, and positively associated with neuroticism. After removing shared variance, cognitive-perceptual schizotypal personality was associated with adaptive personality traits including high conscientiousness and extraversion, but low neuroticism. Interpersonal schizotypal personality was negatively associated with agreeableness, openness to experience,

and extraversion. Disorganized schizotypal personality was positively associated with agreeableness, openness to experience, neuroticism, and extraversion, but negatively associated with conscientiousness. Finally, paranoid schizotypal personality was positively associated with agreeableness, conscientiousness, and neuroticism.

Discussion

The current research examined the nomological network of ASEs with self-concept, aberrant salience, dissociation, and Big 5 personality. The results are consistent with previous work finding that ASEs are negatively associated with self-concept clarity, self-esteem, self-competence,

Table 1

Relationship Between Anomalous Self-Experiences and Schizotypal Personality With Self-Processing, Aberrant Salience, and Dissociation

Criterion	Anomalous self-experiences	Cognitive-perceptual	Interpersonal	Disorganized	Paranoid
Self-concept clarity	−.561***	−.417*	−.431***	−.526***	−.501***
Self-competence	−.302***	−.203***	−.412***	−.387***	−.237*
Self-liking	−.404***	−.287***	−.469***	−.438***	−.333*
Self-esteem	−.481***	−.339***	−.533***	−.496***	−.383***
Full self-consciousness	.448***	.425***	.467***	.503***	.475***
Private self-consciousness	.458***	.442***	.349***	.465***	.467***
Public self-consciousness	.254***	.262***	.295***	.328***	.331***
Aberrant salience	.756***	.721***	.456***	.660***	.709***
Dissociation	.942***	.794***	.571***	.762***	.763***

* *p* < .05. ** *p* < .01. *** *p* < .001.

and self-liking Cicero, Neis, et al., 2017). Moreover, the current study was the first study to examine the relations between ASEs and these variables after removing variance shared with schizotypal personality traits. With the exception of self-consciousness, all of the relations with self-processing remained the same after removing variance shared with schizotypal personality. ASEs were also associated with increased aberrant salience and dissociation before and after removing shared variance with schizotypal personality. Finally, ASEs were found to be associated with maladaptive personality traits including low agreeableness, conscientiousness, and extraversion, but high neuroticism, and these relations remained after removing variance shared with schizotypal personality. Taken together, these findings suggest that ASEs are associated with deficits in self-processing and maladaptive personality, and that

these associations cannot be accounted for by shared variance with schizotypal personality.

The finding that ASEs were related with decreased self-concept clarity and self-esteem, even after removing variance shared with schizotypal personality provides more support for the nomological network of ASEs. Self-disturbances have been conceptualized in several different ways including phenomenological ASEs, bodily disturbances, interoceptive deficits, self-monitoring, and self-agency deficits (e.g., Sass & Parnas, 2003). These methodologies/conceptualizations are rarely included in single studies, but preliminary work suggests there may be important relations between these constructs (Klaunig et al., 2018). Theorists have suggested that ASEs are deficits in "minimal self," which is a basic, foundational level of cognitive processing and self-experience, while a higher cognitive level of

Table 2

Relationship Between Anomalous Self-Experiences and Schizotypal Personality With Self-Processing, Aberrant Salience, and Dissociation After Removing Shared Variance

Criterion	Anomalous self-experiences	Cognitive-perceptual	Interpersonal	Disorganized	Paranoid
Self-concept clarity	−.477***	.413***	.070	−.398**	−.227**
Self-competence	−.334***	.629***	−.151	−.517***	−.003
Self-liking	−.457***	.634***	−.324***	−.226	−.160
Self-esteem	−.532***	.625***	−.383***	−.086	−.1777
Full self-consciousness	.013	−.110	.210**	.151	.297***
Private self-consciousness	.081	.002	.004	.208	.224**
Public self-consciousness	−.017	−.203	.117	.118	.351***
Aberrant salience	.151*	.414***	−.267***	.133	.267**
Dissociation	.844***	−.147	−.234**	.397**	.080

* *p* < .05. ** *p* < .01. *** *p* < .001.

Table 3

Relationship Between Anomalous Self-Experiences and Schizotypal Personality With Big 5 Personality Traits

Personality trait	Anomalous self-experiences	Cognitive-perceptual	Interpersonal	Disorganized	Paranoid
Agreeableness	−.254***	−.175***	−.351***	−.223***	−.089
Conscientiousness	−.245***	−.161***	−.223***	−.243***	−.126**
Openness to experience	−.074	−.042	−.198***	−.101*	−.058
Neuroticism	.381***	.318***	.404***	.441***	.392***
Extraversion	−.110*	−.026	−.536***	−.277***	−.043

* $p < .05$.   ** $p < .01$.   *** $p < .001$.

self-processing has been termed the "narrative self." The narrative self includes aspects of the self that require introspection and evaluation, such as self-concept clarity, self-esteem, and other aspects of personality (Nelson, Parnas, et al., 2014). Thus, disturbances in minimal self (i.e., ASEs) may interfere with an individual's ability to incorporate information about the self into a coherent narrative, resulting in lower self-concept clarity (Klaunig et al., 2018).

In contrast to our expectations, self-consciousness was not significantly associated with ASEs after removing shared variance with schizotypy facets. However, there were significant zero-order correlations. This finding suggests that variance shared with schizotypy, particularly with paranoia, may account for the relations between ASEs and self-consciousness. This finding may also suggest that self-consciousness as an individual difference variable is different from the exaggerated self-consciousness (i.e., hyper-reflexivity) that has been proposed in the ipseity-disturbance model of ASEs (Nelson, Parnas, et al., 2014; Sass & Parnas, 2003). Hyper-reflexivity may be further broken down into primary (i.e., a passive, primary disruption of experience) and secondary (i.e., a secondary reaction to this disruption involving excessive self-scrutiny; Sass et al., 2018). Self-consciousness may be more similar to the

secondary reflective hyper-reflexivity and thus not captured with our model. For example, social anxiety may be driven by a form of self-consciousness which may be different/distinct from the exaggerated self-consciousness of hyper-reflexivity.

Although this was the first study to test the relations among ASEs and several constructs after removing variance shared with schizotypal personality, the finding that ASEs and schizotypy facets were uniquely correlated with other variables is consistent with previous work. Positive symptoms and ASEs independently contribute to social-cognitive deficits (Cicero et al., 2016). Moreover, ASEs may be related to neurocognitive deficits, many of which have been found to be associated with positive and/or negative symptoms (Haug et al., 2012; Nelson, Whitford, et al., 2014). Future research could examine whether ASEs and schizotypal personality independently contribute to understanding neurocognitive deficits.

The current study found that aberrant salience was strongly associated with both ASEs and schizotypal personality factors. After removing shared variance, aberrant salience was still strongly associated with cognitive-perceptual schizotypal personality, but more weakly with paranoia, ASEs, and negatively associated with interpersonal schizotypal personality. This

Table 4

Relationship Between Anomalous Self-Experiences and Schizotypal Personality With Big Five Personality Traits After Removing Shared Variance

Personality trait	Anomalous self-experiences	Cognitive-perceptual	Interpersonal	Disorganized	Paranoid
Agreeableness	−.240**	−.137	−.713***	.555***	.187*
Conscientiousness	−.326***	.302**	.107	−.548***	.229*
Openness to experience	−.095	.154	−.507***	.407*	−.149
Neuroticism	.279**	−.542***	.052	.426**	.273**
Extraversion	−.143	.434***	−1.168***	.466**	.039

* $p < .05$.   ** $p < .01$.   *** $p < .001$.

finding is consistent with previous work linking aberrant salience more strongly with cognitive-perceptual schizotypal personality than with other aspects of schizotypal personality (Cicero et al., 2010, 2013). At the same time, the finding that aberrant salience was associated with ASEs, albeit weakly after removing shared variance, is consistent with previous theoretical and empirical research (Gaweda et al., 2019; Mento et al., 2020).

ASEs were associated with maladaptive personality traits including low agreeableness, low conscientiousness, and high neuroticism, even after removing variance shared with schizotypal personality. This finding complements the associations between ASEs and low self-concept clarity and self-esteem because they can all be viewed as maladaptive traits and cognitions. To our knowledge, this is the first study to examine the relations among ASEs and Big 5 personality. However, previous research has examined the relations among criterion A of the alternative model of personality disorders, particularly with respect to the self-disturbances seen in borderline personality disorder, which may be similar to ASEs in psychosis-spectrum psychopathology. Self-disturbances in borderline personality disorder have been shown to be broadly associated with maladaptive personality traits (Mullins-Sweatt et al., 2012). At the same time, researchers have suggested that schizotypal personality disorder may not be easily represented by Big 5 personality traits. The alternative model of personality disorder includes psychoticism in place of maladaptive openness to experience (Anderson et al., 2013). Future research could examine how ASEs are associated with psychoticism as a personality trait in this conceptualization.

The results are also consistent with psychodynamic conceptualizations. These models propose schizotypal personality to be characterized by low self-esteem, low self-consciousness, but high neuroticism and dissociation, which may suggest an identification with an unconscious part of the personality. In contrast, our findings display a distinct pattern in which ASEs were related to decreased self-concept clarity and low self-esteem in combination with aberrant salience, dissociation, and maladaptation. Such a pattern may imply a confused personality, specifically one which entails consideration of alternative self-perceptions. This may result in maladaptive personality traits and dissociation.

The current research included measures of psychosis-spectrum psychopathology, dissociation, and anomalous self-experiences, but did not include other measures of psychopathology or psychological distress. Previous research has found correlations among other types of psychopathology such as anxiety and depression and several of the variables included in this study such as self-concept clarity (Bigler et al., 2001; Vartanian & Hayward, 2018), self-esteem (Zeigler-Hill, 2011), dissociation (Boysan et al., 2009), aberrant salience (Lisi et al., 2020), and maladaptive personality (Trull et al., 2010). Psychotic-like experiences tend to be transient and associated with risk factors like psychological distress. It is possible that the observed relations among ASEs, schizotypal personality, self-processing, normal personality, and dissociation could be accounted for by shared variance with other types of psychopathology or general psychological distress. Future research could test the relations among ASEs, schizotypal personality, and these other variables while removing shared variance other types of psychopathology and distress.

The results of the current study need to be interpreted within the context of the sample being composed of undergraduates, which were selected in an effort to generalize to a general population of young people in the age-range of risk for the development of psychotic-spectrum disorders. Although psychotic-like experiences have been found throughout the general population (van Os et al., 2009), including in undergraduates (Loewy et al., 2007), undergraduates may be psychologically healthier than the general population, have higher SES, and be more well educated. Thus, the current results may not generalize to samples drawn from the general population or clinical samples of prodromal, first episode, or people with chronic schizophrenia. Given the young age and nonclinical nature of the sample, the ASEs participants report may be relatively normative experiences that are not indicative of overt psychopathology. For example, ASEs may be associated with paranormal or spiritual experiences, as opposed to full-blown delusions and hallucinations. The nonclinical nature of the sample may also restrict the range of the key variables, which would make the observed effects smaller than what may be observed in a clinical sample.

At the same time, the participants in this study may not be accurately characterized as a

"nonclinical" sample. Participants were not excluded for a history of psychopathology or substance abuse. Although we did not assess it in the current research, data drawn from the same subject pool has found that approximately 30% of respondents had a history of psychological treatment (Cicero et al., in press). Thus, the current results may not generalize to samples of participants in which people with psychopathology have been excluded. Regardless, recent models have suggested that psychopathology is dimensional (Kotov et al., 2017; Krueger et al., 2018), and the current sample represented the lower end of the schizophrenia-spectrum, as few participants likely met criteria for a psychotic-spectrum disorder such as schizotypal personality disorder.

At the same time, the sample was diverse, with only 23.9% being of European ancestry. This represents a strength of the current research, because many previous studies on ASEs have included primarily Caucasians. Another potential limitation of the current study is that it relied entirely on self-report scales. Previous research has found that the IPASE is associated with behavioral tasks related to self-disturbances (Klaunig et al., 2018), and future research could examine the links between these behavioral tasks, dissociation, aberrant salience, and Big 5 personality traits. Another limitation of the current study is that the analyses were not preregistered.

ASEs are an important construct that is starting to get more attention in the literature. As a result of a lack of recent study, the nomological network of ASEs is unclear. The current study extends previous work by showing that ASEs are associated with decreased self-concept clarity, self-competence, self-liking, and global self-esteem. ASEs were also associated with increased self-consciousness, aberrant salience, dissociation, and maladaptive personality traits. Most of these relations remained significant, even after removing variance shared with schizotypal personality traits, which are highly correlated with, but distinct from ASEs.

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