ORIGINAL ARTICLE
https://doi.org/10.30773/pi.2025.0054
eISSN 1976-3026
OPEN ACCESS

Interplay of Subjective Symptoms Across the Stages of the Schizophrenia Spectrum

Hye Yoon Park[1,2], Minji Bang[3], and Suk Kyoon An[2,4,5] ✉

[1]Department of Psychiatry, Yonsei University College of Medicine, Yongin Severance Hospital, Yongin, Republic of Korea
[2]Section of Self, Affect and Neuroscience, Institute of Behavioral Science in Medicine, Yonsei University College of Medicine, Seoul, Republic of Korea
[3]Department of Psychiatry, CHA Bundang Medical Center, CHA University, Seongnam, Republic of Korea
[4]Department of Psychiatry, Yonsei University College of Medicine, Severance Hospital, Seoul, Republic of Korea
[5]Graduate Program in Cognitive Science, Yonsei University, Seoul, Republic of Korea

Objective Schizophrenia (SPR) spectrum disorders involve various subjective symptoms, including disruptions in self-awareness, cognitive complaints, and schizotypy. While tools such as the Examination of Anomalous Self-Experience (EASE), Frankfurt Complaint Questionnaire (Frankfurter Beschwerde-Fragebogen, FBF), and Chapman Psychosis Proneness Scales (CPPS) have been employed, research on their interrelations across different stages of the SPR spectrum remains limited, particularly in ultra-high risk (UHR) and SPR groups.

Methods This study examined the EASE, FBF, and CPPS scores among healthy controls (HC), individuals at UHR, and those with SPR. Group differences and the interplay of subjective symptoms were analysed to understand how these dimensions interact and evolve across the psychosis continuum.

Results HCs scored significantly lower on all subjective symptom measures compared to both UHR and SPR groups. Specifically, the HC group (0.82±1.51) scored significantly lower on the EASE than both the UHR (13.90±9.67) and SPR (10.13±9.16) groups ($p<0.001$). Similarly, the FBF scores for HCs (9.75±10.30) were significantly lower than for the UHR (36.27±22.73, $p<0.001$) and SPR (26.77±26.15, $p=0.017$) groups. Significant differences were also found in CPPS subscales, with HCs scoring significantly lower than UHR and SPR groups on the Physical Anhedonia Scale (UHR, $p<0.001$; SPR, $p=0.026$) and the Social Anhedonia Scale (HC vs. UHR: $p<0.001$, HC vs. SPR: $p<0.001$). The differences in subjective disturbances between the UHR and SPR groups were less pronounced and not statistically significant for any of the main measures. Stronger associations among the EASE, FBF, and CPPS were observed in the SPR group.

Conclusion The findings indicate that the UHR and SPR groups share elevated levels of disturbed subjective experiences, with the SPR group showing greater disruptions in the interplay of these experiences. These findings suggest a continuous spectrum of shared experiential anomalies and support the value of integrated assessment approaches. Such combined evaluations may enhance the precision of early psychosis risk detection and longitudinal monitoring, offering a foundational basis for future interventions grounded in phenomenological understanding.

Psychiatry Investig 2026;23(5):635-643

Keywords Schizophrenia; Ultra-high risk for psychosis; Self-disorder; Basic symptoms; Schizotypy.

INTRODUCTION

Theoretical frameworks of schizophrenia (SPR) spectrum disorder propose various mechanisms contributing to its manifestations; however, a comprehensive explanation is yet to be established. The prevailing approach emphasizes the fundamental and essential factors that may subsequently generate a broad array of symptoms. Current early detection strategies for identifying individuals at high risk for psychosis consider both the ultra-high risk (UHR) criteria[1] and basic symptoms criteria.[2,3] Individuals with attenuated psychotic symptoms and functional decline are designated as UHR for psychosis,[1] reflecting subthreshold psychotic symptoms and observable SPR spectrum features. Whereas, basic symptoms denote subtle, subjectively perceived subclinical disturbances in mental processes, known solely to the individual who experiences them.[4] The integration of basic symptoms criteria and attenuated psychotic symptoms in assessing SPR susceptibility un-

Received: February 12, 2025 **Revised:** September 2, 2025
Accepted: February 20, 2026

✉ **Correspondence:** Suk Kyoon An, MD, PhD
Department of Psychiatry, Yonsei University College of Medicine, 50-1 Yonsei-ro, Seodaemun-gu, Seoul 03722, Republic of Korea
Tel: +82-2-2228-1585, **Fax:** +82-2-313-0891, **E-mail:** ansk@yuhs.ac

derscores the significance of subjective experiences in identifying the risk of psychosis. Research has shown that high-risk groups often exhibit heightened levels of self-disturbance,[5-7] suggesting that anomalous self-experience is a core feature of the prodromal stages of SPR.[8] A wide range of tools and methods are employed to measure these anomalous experiences, providing insights into the nuanced transformations in self-experience linked to SPR and enhancing clinical evaluation and research.

The Examination of Anomalous Self-Experience (EASE; a semi-structured clinical interview designed to assess self-experience) is a psychometric checklist developed by Parnas et al.[9] to evaluate subjective anomalies. The EASE functions as a semi-structured clinical interview, investigating cognition and stream of consciousness, self-awareness and presence, bodily experiences, demarcation of self, and existential reorientation. It provides a comprehensive account of subjective anomalies that are not readily captured by conventional clinical metrics, making it an indispensable tool for understanding the fundamental phenomenological experiences inherent in SPR. Numerous studies using the EASE with cohorts across the SPR spectrum have shown that individuals in this group score significantly higher on the EASE compared to other diagnostic groups and healthy controls (HCs).[10] Additionally, empirical research in UHR groups has demonstrated the predictive efficacy of the EASE, with elevated scores linked to increased clinical severity and a higher likelihood of transitioning to overt psychosis.[6,11]

Another pivotal instrument focusing on subjective experiences is the Frankfurt Complaint Questionnaire (Frankfurter Beschwerde-Fragebogen [FBF]; a self-report questionnaire assessing basic symptoms such as cognitive and perceptual disturbances).[12] The FBF is a widely used self-assessment tool for identifying basic symptoms, covering a broad range of cognitive complaints, including those related to perception, thinking, memory, language, movement, and emotion.[12] FBF scores have been significantly associated with positive symptoms[13] and strongly correlated with objective neuropsychological test results in patients with SPR.[14] Furthermore, the FBF has been used to assess subjective experiences in first-degree relatives of patients with SPR, revealing higher scores compared to control groups, suggesting a potential genetic predisposition.[15]

Schizotypy is another relevant concept emphasizing the subjective experiences of individuals within the SPR spectrum. Schizotypy is a complex construct that incorporates a range of traits and symptoms associated with an increased susceptibility to psychosis and a subclinical spectrum of psychotic expressions and cognitive-perceptual anomalies.[16] Research on schizotypy often employs psychometric inventories such as the Chapman Psychosis Proneness Scales (CPPS; a set of self-report inventories measuring schizotypy traits, including Perceptual Aberration Scale [PER], Magical Ideation Scale [MAG], and anhedonia).[17-20] Traits such as unconventional beliefs or perceptual experiences are referred to as positive schizotypy, with the CPPS encompassing scales for PER[18] and MAG.[20] Negative schizotypy is characterized by deficits in social engagement and emotional expression, with Physical Anhedonia Scale (ASP)[17] and Social Anhedonia Scale (ASS)[19] being key to this classification. In contrast to the EASE and FBF, the CPPS reflects the content of subthreshold psychotic experiences rather than the forms or processes of anomalous experiences.[21] Previous studies have shown that both the positive and negative dimensions of the CPPS predict SPR spectrum disorder,[22] with negative schizotypy being particularly associated with the transition to psychosis during the prodromal stages of SPR.[23-25] Taken together, examining the EASE, FBF, and CPPS in parallel offers unique insights, as each instrument captures distinct yet overlapping facets of subjective experience, thereby allowing a more comprehensive understanding of vulnerability across the SPR spectrum.

Because subjective experiences are inherently personal, the wide range of experiences individuals report cannot be fully captured using a single concept or assessment tool.[21] To date, few studies have explored the interrelationships among various tools designed to measure these experiences. For instance, the Anhedonia Scale of the CPPS has been found to relate to UHR criteria but not to basic symptom criteria.[25] Another study reported significant associations between schizotypal ideation and self-reported cognitive difficulties.[26] Additionally, an examination of the relationship between the CPPS and FBF revealed that basic symptoms were significantly associated with positive schizotypy but not with negative schizotypy.[27] No comprehensive study has yet integrated diverse psychosis-proneness scales to examine their interrelations across different stages of the SPR spectrum. This study addresses this gap by investigating the relationships among the EASE, FBF, and CPPS across UHR and SPR populations. Specifically, we aimed to explore these dynamics within the UHR and SPR groups. Understanding these relationships may offer valuable insights into the early identification of psychosis risk and the progression of SPR spectrum disorder. We hypothesized that both the UHR and SPR groups would exhibit significantly higher scores on the EASE, FBF, and CPPS compared to HC, reflecting elevated disturbed subjective experiences. Furthermore, we anticipated stronger correlations between these measures in the SPR group than in the UHR group, suggesting more pronounced disruptions in the interplay of subjective experiences as the disorder advances.

METHODS

Participants

The study included three groups: 25 individuals at UHR, 24 individuals diagnosed with SPR, and 33 HC participants. Participants in the UHR and SPR groups were recruited from the Clinic FORYOU, part of the Green Program for Recognition and Prevention of Early Psychosis (GRAPE) project at Severance Hospital in Seoul, Republic of Korea. Ethical approval for this study was obtained from the Institutional Review Board of Severance Hospital (Approval No. 4-2014-0744). Further details of the GRAPE project have been described elsewhere.[28,29] HC participants were recruited via online advertisements.

All participants were assessed for psychiatric disorders using the Structured Clinical Interview for DSM-IV (SCID-IV).[30,31] SPR was diagnosed based on DSM-IV criteria, while participants at UHR were identified using the Structured Interview for Prodromal Syndromes.[32] Each participant at UHR met at least one of the following three clinical criteria: 1) attenuated positive prodromal syndrome (APPS; n=25), 2) brief intermittent psychotic syndrome (BIPS; n=2), or 3) genetic risk and deterioration syndrome (GRDS; n=6). Participants at UHR with a current or past history of major psychiatric disorders with psychotic features were excluded. HC participants were recruited through advertisements posted on a short-term job recruitment website. They were assessed using the SCID-IV to exclude any current or past psychiatric disorders, and family history of psychotic disorders was checked through clinical interview. No participants in the HC group reported such family history. Exclusion criteria for all groups included neurological disorders, a history of head trauma, and mental retardation (IQ <70).

The Positive and Negative Syndrome Scale (PANSS)[33] was used to assess the clinical characteristics and severity of psychotic symptoms in individuals at UHR and those with SPR. Positive, Negative, and General subscale scores were collected from these groups to quantify symptom severity.

Psychometric measures

EASE

The EASE is a semi-structured clinical interview designed to assess disturbances in self-experience, particularly those related to self-awareness and self-perception, within the SPR spectrum.[9] The Bonner Skala zur Beurteilung von Basissymptomen (BSABS)[34] significantly influenced the development of the EASE, as reflected in the comparative item list included in its documentation. Unlike the BSABS, which addresses a broader range of symptoms, the EASE focuses specifically on disorders of the self.[9] The EASE assesses five domains: cognition and stream of consciousness (17 items), self-awareness and presence (18 items), bodily experiences (9 items), demarcation of self (5 items), and existential reorientation (8 items). Each item is rated for its presence and intensity, contributing to a total EASE score ranging from 0 to 57, which reflects the severity of self-disturbance.[35] Experienced psychiatrists (HYP, MB, and SKA), who attended an official EASE workshop that included training sessions and inter-rater reliability exercises, translated the EASE into Korean and conducted assessments with the participants. Although formal reliability indices (e.g., intraclass correlation coefficient or kappa values) were not computed within the present dataset, the workshop training process incorporated inter-rater reliability validation to ensure consistent application of the instrument.

FBF

The FBF is a self-report measure designed to evaluate basic symptoms commonly observed in individuals with SPR spectrum disorder. It is widely used to assess subjective experiences.[12] The FBF comprises 98 yes/no questions organized into 10 subscales: loss of control, simple perception, complex perception, language, thought, memory, motility, lack of automatism, anhedonia, and sensorial overstimulation. The total score reflects the overall level of cognitive and perceptual complaints, with higher scores indicating more pronounced basic symptoms.

CPPS

The CPPS is a collection of true-false self-report measures designed to assess susceptibility to psychosis. It includes the PER,[18] MAG,[20] ASP,[17] and ASS subscales.[19] The PER subscale comprises 25 items that evaluate unusual perceptual experiences and body image disturbances, while the MAG subscale includes 30 items assessing beliefs rooted in magical thinking, such as the perceived influence of one's thoughts on external events. These two subscales represent positive schizotypy and address disruptions in the self–other boundary concerning physical and mental aspects, respectively. The ASP subscale contains 61 items that assess the inability to derive pleasure from physical sensations, whereas the ASS subscale comprises 40 items measuring social withdrawal and a diminished enjoyment of social interactions. These two subscales represent negative schizotypy and focus on the inability to experience pleasure in hypothetical physical and social contexts. Each subscale is scored independently, with higher scores indicating a greater degree of psychosis proneness within the corresponding domain.

Statistical analysis

All statistical analyses were conducted using the Statistical Package for the Social Sciences, version 27 (IBM Corp). For cases with missing data on self-report measures (FBF and CPPS), participants with incomplete responses were excluded listwise from the corresponding analyses. A one-way analysis of variance, with group type as a fixed factor, was performed to evaluate differences among the three groups (HC, UHR, and SPR) in terms of age, years of education, and scores on the EASE, FBF, and CPPS. Post-hoc pairwise comparisons used the Scheffé test, and the post-hoc column reports 'Cohen's d; Scheffé-adjusted p'. Cohen's d was calculated from the pooled standard deviation for each pairwise contrast. An independent t-test was employed to compare the UHR and SPR groups for PANSS scores and chlorpromazine equivalent doses. The chi-square test was used to assess differences in sex ratios across the groups. Spearman's correlations were computed to examine the relationships among the EASE, FBF, and CPPS scores within the UHR and SPR groups. Two-sided p<0.05 were considered statistically significant.

RESULTS

Demographic and clinical characteristics

The demographic and clinical characteristics of the HC, UHR, and SPR groups are summarized in Table 1. No significant differences were found across the groups in terms of age (p=0.168), sex (p=0.131), or years of education (p=0.088), indicating that the groups were generally demographically comparable. For clinical characteristics, PANSS scores were assessed in the UHR and SPR groups. The Positive subscale showed a significant difference between the UHR and SPR groups, with SPR participants scoring higher (17.95±6.66) than the UHR group (13.50±3.54; p=0.01). However, no significant differences were found between the UHR and SPR groups on the negative (p=0.459) and general (p=0.918) subscales.

Group comparisons of the EASE, FBF, and CPPS

Table 2 presents the group comparisons of the EASE, FBF, and CPPS across the HC, UHR, and SPR groups. The total EASE score differed significantly between the groups (p< 0.001). Both UHR (13.90±9.67) and SPR (10.13±9.16) groups scored significantly higher than the HC (0.82±1.51), with post-hoc tests confirming these differences (HC vs. UHR, p<0.001; HC vs. SPR, p<0.001). However, the difference between the UHR and SPR groups was not statistically significant (p=0.206).

The total FBF scores also showed significant group differences (p<0.001). The UHR group scored the highest (36.27± 22.73), followed by the SPR group (26.77±26.15), while the HC group had the lowest scores (9.75±10.30). Post-hoc tests revealed significant differences between the HC and UHR groups (p<0.001) and the HC and SPR groups (p=0.017); however, no significant difference was observed between the UHR and SPR groups (p=0.315).

The CPPS revealed significant differences across groups for certain subscales. On the PER subscale, the SPR group (8.51± 10.02) scored significantly higher than the HC group (3.55± 3.27; p=0.046); however, no significant differences were observed between the UHR group and either the HC or SPR groups. No significant group differences were found on the MAG subscale (p=0.196). The ASP subscale showed significant differences, with both the UHR (23.42±11.75) and SPR (20.15±13.30) groups scoring significantly higher than the HC group (11.84±6.73; both p<0.001). No significant difference was observed between the UHR and SPR groups (p= 0.613). Finally, on the ASS subscale, both the UHR (22.67± 7.35) and SPR (18.57±9.48) groups scored significantly higher than the HC group (8.58±4.63; p<0.001). No significant difference was found between the UHR and SPR groups (p= 0.189).

Table 1. Characteristics of the study participants

Category	Variable	HC (N=33)	UHR (N=25)	SPR (N=24)	p
Demographics	Age (yr)	21.27±2.40	21.72±4.84	23.08±3.46	0.168
	Sex (female/male)	15/18	6/19	12/12	0.131
	Education (yr)	13.73±0.94	12.76±2.55	13.83±2.06	0.088
PANSS*	Positive	-	13.50±3.54	17.95±6.66	0.010
	Negative	-	16.29±6.38	18.19±9.96	0.459
	General	-	34.33±6.84	34.02±12.29	0.918
Antipsychotics	Medicated/unmedicated	-	7/18	16/8	<0.001
	Chlorpromazine equivalent dose (mg/d)†	-	146.4±136.9	286.0±202.4	0.113

The values are presented as mean±standard deviation. *PANSS data were available for UHR: 24 and SPR: 21; †chlorpromazine equivalent dose was derived from Kroken et al.[45] HC, healthy controls; PANSS, Positive and Negative Syndrome Scale; SPR, schizophrenia; UHR, ultra-high risk.

Correlations among the EASE, FBF, and CPPS in each clinical group

Figure 1 illustrates the correlations among the EASE, FBF, and CPPS subscales for both the UHR and SPR groups. In the UHR group, moderate correlations were observed between the EASE and FBF (r=0.42, 95% confidence interval [CI] [0.03, 0.70]), and between the FBF and CPPS: PER (r=0.57, 95% CI [0.18, 0.80]). Additionally, a strong correlation was found between the FBF and CPPS: MAG (r=0.78, 95% CI [0.53, 0.91]).

Strong correlations were observed across all measurements in the SPR group. The correlation between the EASE and

Table 2. Group comparisons of EASE, FBF, and CPPS scores

Category	Variable	HC	UHR	SPR	p	Post Hoc (Cohen's d; Scheffé-adjusted p)
EASE*	Total	0.82±1.51	13.90±9.67	10.13±9.16	<0.001	HC vs. UHR: d=-2.03; adj p<0.001 HC vs. SPR: d=-1.54; adj p<0.001 UHR vs. SPR: d=0.40; adj p=0.206
FBF†	Total	9.75±10.30	36.27±22.73	26.77±26.15	<0.001	HC vs. UHR: d=-1.61; adj p<0.001 HC vs. SPR: d=-0.98; adj p=0.017 UHR vs. SPR: d=0.39; adj p=0.315
CPPS‡	PER	3.55±3.27	7.67±7.14	8.51±10.02	0.020	HC vs. UHR: d=-0.81; adj p=0.094 HC vs. SPR: d=-0.77; adj p=0.046 UHR vs. SPR: d=-0.10; adj p=0.925
	MAG	7.18±4.40	9.75±7.52	10.11±7.81	0.196	HC vs. UHR: d=-0.44; adj p=0.356 HC vs. SPR: d=-0.50; adj p=0.296 UHR vs. SPR: d=-0.05; adj p=0.984
	ASP	11.84±6.73	23.42±11.75	20.15±13.30	<0.001	HC vs. UHR: d=-1.29; adj p<0.001 HC vs. SPR: d=-0.87; adj p=0.026 UHR vs. SPR: d=0.26; adj p=0.613
	ASS	8.58±4.63	22.67±7.35	18.57±9.48	<0.001	HC vs. UHR: d=-2.42; adj p<0.001 HC vs. SPR: d=-1.49; adj p<0.001 UHR vs. SPR: d=0.49; adj p=0.189

The values are presented as mean±standard deviation. *EASE data were available for HC: 33, UHR: 25, and SPR: 24; †FBF data were available for HC: 32, UHR: 22, and SPR: 17; ‡CPPS data were available for HC: 33, UHR: 21, and SPR: 18. ASS, Social Anhedonia Scale; ASP, Physical Anhedonia Scale; CPPS, Chapman Psychosis Proneness Scale; EASE, Examination of Anomalous Self-Experience; FBF, Frankfurt Complaint Questionnaire; HC, healthy controls; MAG, Magical Ideation Scale; PER, Perceptual Aberration Scale; SPR, schizophrenia; UHR, ultra-high risk.

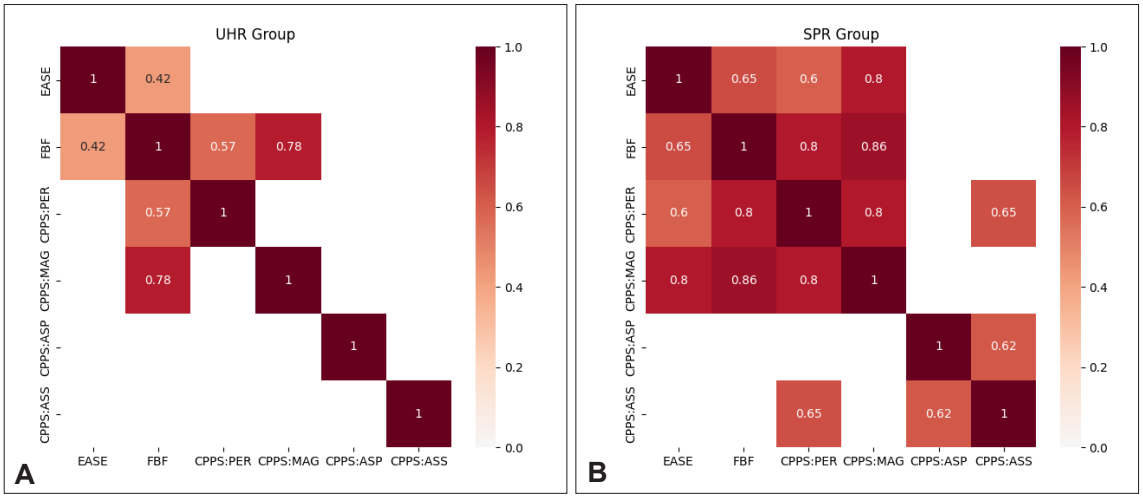

Figure 1. Correlation matrices of subjective experience measures in UHR and SPR groups. Heatmaps depicting the correlation coefficients between the EASE, FBF, and CPPS subscales in the UHR (A) and SPR groups (B). Darker shades indicate stronger correlations. Only correlations with p-values less than 0.05 are displayed. The results showed stronger and more widespread correlations in the SPR group than those in the UHR group. ASS, Social Anhedonia Scale; ASP, Physical Anhedonia Scale; CPPS, Chapman Psychosis Proneness Scale; EASE, Examination of Anomalous Self-Experience; FBF, Frankfurt Complaint Questionnaire; MAG, Magical Ideation Scale; PER, Perceptual Aberration Scale; SPR, schizophrenia; UHR, ultra-high risk.

FBF was high (r=0.65, 95% CI [0.33, 0.83]). The correlation between EASE and CPPS was also significant for CPPS: PER (r=0.60, 95% CI [0.18, 0.83]) and CPPS:MAG (r=0.80, 95% CI [0.53, 0.92]). Moreover, strong correlations were found between the FBF and CPPS:PER (r=0.80, 95% CI [0.52, 0.92]) and CPPS:MAG (r=0.86, 95% CI [0.65, 0.95]). Although these patterns suggest stronger interrelationships compared to the UHR group, Fisher's z-tests did not reveal statistically significant differences between the two groups (EASE–FBF: z=-1.07, p=0.283; FBF–CPPS: PER: z=-1.27, p=0.206). These findings should be interpreted with caution given the limited sample size.

DISCUSSION

This study uniquely examined the interrelation between three psychosis-proneness evaluations centered on subjective experiential symptoms: the EASE interview for anomalous self-experiences, the FBF self-assessment for basic symptoms, and the CPPS for assessing schizotypy. Although each tool is often used independently to measure different aspects of subjective experiences, our findings demonstrate the complementary nature of these scales in capturing overlapping yet distinct facets. By assessing the relationships between the EASE, FBF, and CPPS across the UHR and SPR groups, we highlight how these tools collectively provide a nuanced understanding of subjective experiences within the SPR spectrum.

The study revealed significant differences between the HC group and both the UHR and SPR groups across the EASE, FBF, and CPPS measures, indicating heightened disturbed subjective experiences in the clinical groups, consistent with prior research on self-disorders in SPR spectrum disorder.[10,36] However, the disparity between the UHR and SPR groups was not statistically significant, which contrasts with previous investigations.[7,36,37] This suggests that UHR cohorts demonstrated an attenuation in self-disorder; thus, the findings can be interpreted as a consequence of intrinsic heterogeneity within UHR populations. The limited sample size in the present study may have contributed to the lack of significant results. While ceiling effects could be considered as a potential explanation, the mean and standard deviation values in both groups were well below the maximum ranges of the EASE, FBF, and CPPS, indicating that such effects are unlikely to account for the non-significant differences. Instead, the heterogeneity of the UHR group, encompassing individuals with different levels of symptom severity and diverse trajectories of risk, may have obscured group-level contrasts. In contrast, the relatively homogeneous characteristics of the UHR cohort in this study, composed exclusively of individuals meeting the APPS criteria (n=25), may suggest that, in the prodromal stage of SPR, the awareness of disturbed subjective experiences could be as pronounced as in SPR. Alternatively, subjective symptoms may not follow the same progression pattern as objective clinical symptoms, with some disturbances plateauing early in the illness course while others fluctuating over time. Taken together, these considerations suggest that the absence of significant differences between UHR and SPR should be interpreted with caution.

This outcome suggests that, despite the different stages (prodromal and active) of symptom severity, individuals in the UHR and SPR groups share common features in terms of subjective disturbances. Bleuler[38] characterized SPR by prioritizing certain trait-like, non-psychotic symptoms as fundamental ego disorders, while designating delusions and hallucinations as accessory symptoms and interpreting them as diagnostically non-specific. Despite ongoing debates regarding the heterogeneity of UHR and SPR, our findings suggest that these clinical groups constitute a homogeneous continuum with shared subjective experiences of disturbance. This perspective underscores the necessity of evaluating subjective experiences and the core experiential aspects of selfhood to capture the essence of SPR spectrum disorders, as well as the value of encouraging patients to spontaneously share their experiences.[39]

Examination of the interrelations between the EASE, FBF, and CPPS within each group (UHR and SPR) revealed a complex interplay between self-disturbances, basic symptoms, and schizotypal characteristics. Initially, the EASE and FBF were significantly correlated in both the UHR and SPR groups. Prior research[40,41] has shown that basic symptoms assessed through questionnaires often poorly correspond to those evaluated through interviews, as demonstrated in studies using the Eppendorf Schizophrenia Inventory[42] and the Schizophrenia Proneness Instrument (SPI[43]; highlighting methodological diversity. The EASE construct addresses disturbances pertaining to the self across a comprehensive array of fundamental symptoms, thus indicating a correlation with the FBF in this study. The findings also suggest that the EASE and FBF may complement each other as interview-based self-assessment tools for evaluating subjective anomalous experiences. This also indicates the potential of these tools to represent related constructs, warranting further investigation, such as factor analysis to identify correlated items and better understand their interrelationships.

Significant correlations were identified between the FBF and the positive (PER and MAG) CPPS subscales in the UHR group. Furthermore, in the SPR group, both EASE and FBF were associated with the CPPS positive subscales (PER and MAG). No correlation was observed between negative schizotypy and the FBF. In studies examining the relationship between basic symptoms and schizotypy, a cohort characterized

by high schizotypy exhibited elevated levels of basic symptoms,[44] whereas another investigation revealed that questionnaires assessing positive schizotypy and the FBF demonstrated several overlapping characteristics.[27] Conversely, one study indicated that the PER, MAG, and ASP dimensions of the CPPS had no significant correlation with basic symptoms, which were assessed using the SPI instead of the FBF.[25] Amid these inconclusive findings in previous research, our results offer evidence to support the association between self-disorders, basic symptoms, and positive schizotypy. Additionally, our study suggests that future comprehensive research on this relationship would benefit from a comparative analysis of various assessment tools.

Although our cross-sectional design and small sample size limit definitive conclusions on progression, the more intricate and interlinked correlation patterns in the SPR group may be suggestive of a more cohesive integration of subjective anomalous self-experiences, basic symptoms, and schizotypy measures, potentially contributing to observable psychotic symptom constellations. Previous research[16,24] has indicated that self-disturbance or schizotypy alone does not intrinsically result in clinical significance. Instead, attenuated psychotic symptoms may be triggered by high schizotypy and neurobiological aberrations in information processing, which are articulated as basic symptoms; the accumulation of these symptoms potentially leads to the development of overt psychosis. These findings are consistent with the notion that as the severity of psychosis or related symptoms increases, the interactions between different subjective symptom measures may become stronger, possibly reflecting more generalized or systematic disruptions in cognitive and emotional processing. This interplay underscores the importance of addressing multiple dimensions simultaneously to gain a more holistic understanding of SPR psychopathology. However, as we did not conduct formal interaction analyses, future research with larger samples and interaction analyses is needed to further explore these complex relationships.

Despite these findings, this study had several limitations. First, the cross-sectional design limited our ability to draw causal conclusions regarding the progression of disturbed subjective experiences across the SPR spectrum. Longitudinal studies are required to track the development and interaction of these symptoms over time. Second, the small sample size may have limited the generalizability of our findings. Third, although medication status and chlorpromazine equivalent doses were recorded, we did not conduct subgroup analyses according to medication status. Given the relatively small sample size, such analyses would have lacked sufficient statistical power. Nevertheless, antipsychotic medication may influence subjective symptom reporting, particularly for EASE domains involving self-awareness and cognitive function. While treatment may reduce the intensity of self-disorders, side effects such as sedation or cognitive dulling may alter participants' responses on certain items. Future studies with larger samples should explicitly address the role of medication in shaping subjective symptom profiles. Fourth, although we observed stronger correlations in the SPR group compared to the UHR group, Fisher's z-tests did not reveal significant group differences, and several comparisons could not be tested because correlations were available only in one group. The relatively small sample size further limited the statistical power of these analyses. Fifth, while our primary goal was to explore the relationships between these measures, the lack of a formal multiple comparison correction for all statistical tests is a limitation. Future studies with larger and more diverse samples will help validate and expand our results. Additionally, although our study used well-established tools (EASE, FBF, and CPPS), further research should incorporate additional subjective measures to capture a broader range of experiences related to SPR spectrum disorders. Given that our sample was drawn entirely from a Korean population, cultural factors may have influenced the way participants reported subjective symptoms. For example, stigma related to mental illness may reduce willingness to disclose anomalous experiences, and cultural norms emphasizing collectivism and social harmony may shape how self-awareness and interpersonal disturbances are expressed. These factors limit the generalizability of our findings, underscoring the importance of cross-cultural research to validate the applicability of subjective symptom measures across diverse populations.

In summary, our investigation showed that clinical cohorts at different stages of the SPR continuum, including the UHR and SPR groups, exhibited significant deviations in their subjective experiences. Furthermore, the associations identified among EASE, FBF, and CPPS are consistent with the notion that the interrelations among these measures may become more pronounced as the intensity of psychosis or related symptoms increases, potentially due to more pervasive or systematic disturbances in cognitive and emotional processing. However, longitudinal studies are needed to confirm this. Understanding these interrelationships provides valuable insights into the phenomenological structure of SPR and indicates that combining these tools can help mitigate the limitations of each individual scale. Taken together, these findings highlight the importance of assessing subjective experiences when evaluating individuals at clinical high risk for psychosis. Clinicians should routinely evaluate multiple dimensions of subjective experiences in UHR individuals, as their patterns of disturbance may resemble those of SPR more than previously recognized. Incorporating structured instruments such

as the EASE, FBF, and CPPS into clinical assessments may facilitate earlier detection of individuals at risk and support more personalized intervention strategies.

Availability of Data and Material

The datasets generated or analyzed during the study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Author Contributions

Conceptualization: Hye Yoon Park, Suk Kyoon An. Data curation: all authors. Formal analysis: Hye Yoon Park. Funding acquisition: Hye Yoon Park. Methodology: Hye Yoon Park. Project administration: Suk Kyoon An. Resources: Suk Kyoon An. Software: Hye Yoon Park. Supervision: Minji Bang, Suk Kyoon An. Validation: Minji Bang, Suk Kyoon An. Writing—original draft: Hye Yoon Park. Writing—review & editing: Minji Bang, Suk Kyoon An.

ORCID iDs

Hye Yoon Park	https://orcid.org/0000-0001-9579-8112
Minji Bang	https://orcid.org/0000-0002-1669-4014
Suk Kyoon An	https://orcid.org/0000-0003-4576-6184

Funding Statement

This study was supported by the Korean Society for Schizophrenia Research.

Acknowledgments

None

REFERENCES

1. Yung AR, McGorry PD. The prodromal phase of first-episode psychosis: past and current conceptualizations. Schizophr Bull 1996;22:353-370.
2. Fusar-Poli P, Borgwardt S, Bechdolf A, Addington J, Riecher-Rössler A, Schultze-Lutter F, et al. The psychosis high-risk state: a comprehensive state-of-the-art review. JAMA Psychiatry 2013;70:107-120.
3. Schultze-Lutter F, Michel C, Schmidt SJ, Schimmelmann BG, Maric NP, Salokangas RK, et al. EPA guidance on the early detection of clinical high risk states of psychoses. Eur Psychiatry 2015;30:405-416.
4. Schultze-Lutter F. Subjective symptoms of schizophrenia in research and the clinic: the basic symptom concept. Schizophr Bull 2009;35:5-8.
5. Comparelli A, Corigliano V, De Carolis A, Pucci D, Angelone M, Di Pietro S, et al. Anomalous self-experiences and their relationship with symptoms, neuro-cognition, and functioning in at-risk adolescents and young adults. Compr Psychiatry 2016;65:44-49.
6. Nelson B, Thompson A, Yung AR. Basic self-disturbance predicts psychosis onset in the ultra high risk for psychosis "prodromal" population. Schizophr Bull 2012;38:1277-1287.
7. Raballo A, Pappagallo E, Dell' Erba A, Lo Cascio N, Patane' M, Gebhardt E, et al. Self-disorders and clinical high risk for psychosis: an empirical study in help-seeking youth attending community mental health facilities. Schizophr Bull 2016;42:926-932.
8. Nelson B, Raballo A. Basic self-disturbance in the schizophrenia spectrum: taking stock and moving forward. Psychopathology 2015;48:301-309.
9. Parnas J, Møller P, Kircher T, Thalbitzer J, Jansson L, Handest P, et al. EASE: examination of anomalous self-experience. Psychopathology 2005;38:236-258.
10. Henriksen MG, Raballo A, Nordgaard J. Self-disorders and psychopathology: a systematic review. Lancet Psychiatry 2021;8:1001-1012.
11. Koren D, Tzivoni Y, Schalit L, Adres M, Reznik N, Apter A, et al. Basic self-disorders in adolescence predict schizophrenia spectrum disorders in young adulthood: a 7-year follow-up study among non-psychotic help-seeking adolescents. Schizophr Res 2020;216:97-103.
12. Süllwold L. [Die selbstwahrnehmung defizitärer störungen: psychologische aspekte des basisstörungskonzeptes]. In: Süllwold L, Huber G, editors. [Schizophrene basisstörungen]. Berlin, Heidelberg: Springer, 1986, p.1-38. German
13. Kim JH, Byun HJ, Ann JH, Lee J. Relationship between subjective experiences and psychopathological dimensions in schizophrenia. Aust N Z J Psychiatry 2010;44:952-957.
14. Cuesta MJ, Peralta V, Juan JA. Abnormal subjective experiences in schizophrenia: its relationships with neuropsychological disturbances and frontal signs. Eur Arch Psychiatry Clin Neurosci 1996;246:101-105.
15. Loas G, Dimassi H, Yon V, Monestes JL. Subjective experiences in first-degree relatives of schizophrenic subjects. Psychol Rep 2012;111:493-494.
16. Flückiger R, Michel C, Grant P, Ruhrmann S, Vogeley K, Hubl D, et al. The interrelationship between schizotypy, clinical high risk for psychosis and related symptoms: cognitive disturbances matter. Schizophr Res 2019;210:188-196.
17. Chapman LJ, Chapman JP. Revised physical anhedonia scale. Madison: University of Wisconsin; 1978. Unpublished test
18. Chapman LJ, Chapman JP, Raulin ML. Body-image aberration in schizophrenia. J Abnorm Psychol 1978;87:399-407.
19. Eckblad ML, Chapman LJ, Chapman JP, Mishlove M. The revised social anhedonia scale. Madison: University of Wisconsin; 1982. Unpublished test
20. Eckblad M, Chapman LJ. Magical ideation as an indicator of schizotypy. J Consult Clin Psychol 1983;51:215-225.
21. Schultze-Lutter F, Debbané M, Theodoridou A, Wood SJ, Raballo A, Michel C, et al. Revisiting the basic symptom concept: toward translating risk symptoms for psychosis into neurobiological targets. Front Psychiatry 2016;7:9.
22. Kwapil TR, Gross GM, Silvia PJ, Barrantes-Vidal N. Prediction of psychopathology and functional impairment by positive and negative schizotypy in the Chapmans' ten-year longitudinal study. J Abnorm Psychol 2013;122:807-815.
23. Bang M, Park JY, Kim KR, Lee SY, Song YY, Kang JI, et al. Psychotic conversion of individuals at ultra-high risk for psychosis: the potential roles of schizotypy and basic symptoms. Early Interv Psychiatry 2019;13:546-554.
24. Debbané M, Eliez S, Badoud D, Conus P, Flückiger R, Schultze-Lutter F. Developing psychosis and its risk states through the lens of schizotypy. Schizophr Bull 2015;41(Suppl 2):S396-S407.
25. Flückiger R, Ruhrmann S, Debbané M, Michel C, Hubl D, Schimmelmann BG, et al. Psychosis-predictive value of self-reported schizotypy in a clinical high-risk sample. J Abnorm Psychol 2016;125:923-932.
26. Corcoran R, Devan K, Durrant S, Liddle P. The relationship between schizotypal ideation and subjective cognition reflects more than just cognitive disorganisation: introducing the brief cognitive schizotypy index. Cogn Neuropsychiatry 2013;18:491-514.
27. Yon V, Loas G, Monestès JL. Relationships between schizotypy and subjective experiences in a sample of 399 university students. Compr Psychiatry 2009;50:142-150.
28. An SK, Kang JI, Park JY, Kim KR, Lee SY, Lee E. Attribution bias in ultra-high risk for psychosis and first-episode schizophrenia. Schizophr Res 2010;118:54-61.
29. Kang JI, Park HJ, Kim SJ, Kim KR, Lee SY, Lee E, et al. Reduced binding potential of GABA-A/benzodiazepine receptors in individuals at ultra-high risk for psychosis: an [18F]-fluoroflumazenil positron emission tomography study. Schizophr Bull 2014;40:548-557.
30. First MB, Spitzer RL, Gibbon M, Williams JBW. Structured clinical interview for DSM-IV-TR axis I disorders, research version, patient edition (SCID-I/P). New York: Biometrics Research, New York State Psychiatric Institute; 2002.

31. First MB, Spitzer RL, Gibbon M, Williams JBW. Structured clinical interview for DSM-IV-TR axis I disorders, research version, non-patient edition (SCID-I/NP). New York: Biometrics Research, New York State Psychiatric Institute; 2002.
32. Miller TJ, McGlashan TH, Rosen JL, Cadenhead K, Cannon T, Ventura J, et al. Prodromal assessment with the structured interview for prodromal syndromes and the scale of prodromal symptoms: predictive validity, interrater reliability, and training to reliability. Schizophr Bull 2003;29:703-715.
33. Kay SR, Fiszbein A, Opler LA. The positive and negative syndrome scale (PANSS) for schizophrenia. Schizophr Bull 1987;13:261-276.
34. Gross G, Huber G, Klosterkötter J, Linz M. Bonn scale for the assessment of basic symptoms-BSABS. Berlin: Springer; 1987.
35. Nordgaard J, Parnas J. Self-disorders and the schizophrenia spectrum: a study of 100 first hospital admissions. Schizophr Bull 2014;40:1300-1307.
36. Raballo A, Monducci E, Ferrara M, Fiori Nastro P, Dario C; RODIN Group. Developmental vulnerability to psychosis: selective aggregation of basic self-disturbance in early onset schizophrenia. Schizophr Res 2018;201:367-372.
37. Nelson B, Lavoie S, Gawęda Ł, Li E, Sass LA, Koren D, et al. The neurophenomenology of early psychosis: an integrative empirical study. Conscious Cogn 2020;77:102845.
38. Bleuler E. Dementia praecox or the group of schizophrenias. Zinkin J, translator. New York: International Universities Press; 1950.
39. Nordgaard J, Henriksen MG, Jansson L, Handest P, Møller P, Rasmussen AR, et al. Disordered selfhood in schizophrenia and the examination of anomalous self-experience: accumulated evidence and experience. Psychopathology 2021;54:275-281.
40. Maß R. Eppendorf schizophrenia inventory (ESI) vs. Frankfurt complaint questionnaire (FCQ). Direct comparison in a clinical trial. Der Nervenarzt 2005;76:1109-1116.
41. Michel C, Kutschal C, Schimmelmann BG, Schultze-Lutter F. Convergent and concurrent validity of the Frankfurt complaint questionnaire as a screener for psychosis risk. J Risk Res 2017;20:1480-1496.
42. Mass R. Characteristic subjective experiences of schizophrenia. Schizophr Bull 2000;26:921-931.
43. Schultze-Lutter F, Wieneke A, Picker H, Rolff Y, Steinmeyer EM, Ruhrmann S, et al. The schizophrenia prediction instrument, adult version (SPI-A). Schizophr Res 2004;70:76-77.
44. Hazan H, Reese E, Linscott RJ. Basic self-disturbance in schizotypy. Early Interv Psychiatry 2022;16:26-33.
45. Kroken RA, Johnsen E, Ruud T, Wentzel-Larsen T, Jørgensen HA. Treatment of schizophrenia with antipsychotics in Norwegian emergency wards, a cross-sectional national study. BMC Psychiatry 2009;9:24.