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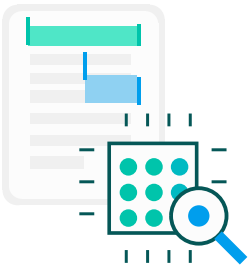

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A Cross-Sectional Comparative study of Negative Symptoms in Young People with First-Episode Psychosis and Severe Social Disability: Secondary data analysis from the SUPEREDEN3 and PRODIGY Trials

1. Introduction:

Negative symptoms refer to the reduction of normal emotional, motivational and social functioning that typically accompany schizophrenia and related psychotic disorders. These symptoms include avolition (reduced initiation of goal-directed activity), asociality (reduced interest in social contact), blunted affect (reduced outward expression of emotion), anhedonia (reduced capacity to experience pleasure), alogia (reduced spontaneous speech), and attention deficits. Negative symptoms represent a reduction or deficit in normal functioning, in contrast to “positive symptoms” such as delusions and hallucinations, which reflect an addition of abnormal experiences rather than a loss of function (Kirkpatrick et al., 2006).

There is substantial evidence linking negative symptoms to functional outcomes in psychosis, with greater negative symptom severity associated with poorer functional outcomes (Correll & Schooler, 2020). However, low motivation and diminished pleasure are also common features of mood and anxiety disorders, and are captured using similar structured clinical interviews and self-report tools. This overlap suggests that negative symptoms may not be specific to psychosis but instead reflect transdiagnostic processes associated with deficits in goal-directed behavior.

Because negative symptoms are strongly linked to poor functioning in daily life, it is important to understand how they appear in different clinical populations. In particular, comparing individuals with first-episode psychosis to those with non-psychotic disorders who have severe social disability can help determine the severity and presentation of negative symptoms across these groups.

This study addresses this question through secondary analysis of two existing UK trial datasets — SUPEREDEN3, a trial of early intervention for first-episode psychosis, and PRODIGY, a study of young people with non-psychotic mental health difficulties and severe social disability — comparing the two groups on the presentation of negative symptoms.

2. Background:

First-episode psychosis refers to the point at which an individual first meets diagnostic criteria for a psychotic disorder — a cluster of conditions, including schizophrenia, characterized by hallucinations, delusions, and disorganized thinking that reflect a loss of contact with shared reality. This period is clinically significant, as early intervention is associated with long-term improvement in functioning (Birchwood et al., 1998). Negative symptoms are commonly present from the early onset of psychosis and are typically assessed using clinician-rated scales such as the Scale for the Assessment of Negative Symptoms (SANS; Andreasen, 1983).

Social disability is characterized by significant difficulties in engaging in structured activities, including work, education, and social or leisure activities. Individuals without any mental health condition typically engage in approximately 64 hours a week on structured activities. Engaging in less than 30 hours per week represents significant social disability, and under 15 hours reflects severe impairment in functioning (Hodgekins et al., 2015). Social disability can be seen in young people before the development of any mental health condition, and it increases the risk of developing a significant long-term disorder (Fowler et al., 2010). Because negative symptoms such as avolition and social withdrawal directly reduce engagement in structured activity, understanding social disability provides an important functional marker through which negative symptoms can be examined, even in the absence of psychosis.

Research suggests that negative symptoms are also observed in non-psychotic disorders. Research using methods such as network and factor analysis has identified anhedonia as a core symptom contributing to symptom severity across various mental health conditions, including anxiety, depression, autism, and ADHD (Guineau et al., 2022).

Cross-sectional and longitudinal studies on depression indicate that symptoms such as anhedonia and avolition are associated with poor social and occupational functioning even after controlling for depression severity (Quek et al., 2021).

Psychological factors such as anxiety have been shown to predict negative symptom severity in psychosis (Zeng et al., 2025), while depression and hopelessness have been linked

to motivational negative symptoms such as avolition (Couture et al., 2011; Edwards et al., 2019). Negative schemas, such as defeatist beliefs, have similarly been associated with negative symptoms in clinically high-risk young people (Devoe et al., 2021). Together, these associations suggest that psychological factors may play a significant role in the presentation of negative symptoms across diagnostic groups.

3. Rationale:

Despite substantial research on negative symptoms in psychosis, our knowledge of how these symptoms differ in individuals with non-psychotic disorders who have severe social disability remains limited. This presents an important gap in the literature, since both populations show significant functional impairment but are usually studied separately. A direct comparison between these groups offers a valuable opportunity to test whether negative symptoms are specific to psychotic disorders or instead represent a transdiagnostic mechanism contributing to social and functional impairment.

Exploring differences in the severity and profile of negative symptoms — specifically diminished motivation (reduced drive to initiate goal-directed behavior, encompassing avolition and anhedonia) and diminished expression (reduced outward display of emotion and speech, encompassing blunted affect and alogia) — will allow for a deeper understanding of how negative symptoms present across clinical populations. These two dimensions were prioritized because they represent the two higher-order factors consistently identified in contemporary models of negative symptoms (Blanchard & Cohen, 2006), and because motivation and expression may be differentially associated with functional and psychological outcomes. The presence of distinct profiles across groups would indicate that negative symptoms may reflect different underlying mechanisms in psychotic compared with non-psychotic disorders.

Additionally, comparisons of psychological variables such as mood, anxiety, hopelessness and negative schemas between high versus low negative symptoms provide a better understanding of the factors related to symptom severity. These variables have been associated with motivational and functional deficits, but their role has not been compared between psychotic and non-psychotic groups. Differences in these factors may further clarify

whether similar or distinct psychological processes contribute to higher negative symptoms across different populations.

4. **Research Question:**

How do negative symptoms differ between young people with first-episode psychosis (SUPEREDEN3) and young people with non-psychotic mental health difficulties and severe social disability (PRODIGY)?

Objectives:

1. To categorize overall negative symptoms using the SANS into diminished motivation and diminished expression.
2. To classify participants into high and low negative symptom groups based on these dimensions.
3. To compare negative symptom domains between participants in the SUPEREDEN3 and PRODIGY studies.
4. To examine differences in functioning and psychological variables (depression, anxiety, maladaptive schemas and hopelessness) both within group (high and low) and between groups (PRODIGY and SUPEREDEN3).

6. Method

6.1 Design

This study used a cross-sectional, quantitative, comparative design based on secondary analysis of two pre-existing datasets: SUPEREDEN3 (a UK randomized controlled trial evaluating early intervention services for young people experiencing first-episode psychosis) and PRODIGY (a UK study of young people with non-psychotic mental health difficulties and severe social disability, characterized by low engagement in structured activity). The design was observational and examined naturally occurring differences between two clinical cohorts: young people with first-episode psychosis and young people with non-psychotic mental health difficulties and severe social disability.

This design was appropriate for the research aims, as the study focused on comparing the profile and severity of negative symptoms, psychological variables, and structured activity levels across the two groups. It also allowed both between-group comparisons, between the PRODIGY and SUPEREDEN3 samples, and within-group comparisons in participants with high and low levels of negative symptoms.

6.2 Participants

The study sample consisted of 424 young people aged 16-35 years drawn from two UK-based clinical cohorts: SUPEREDEN3 and PRODIGY. These cohorts allowed comparison between individuals with first-episode psychosis and those with non-psychotic mental health difficulties who experienced significant impairment in functioning.

The SUPEREDEN3 sample consisted of 154 individuals aged 16-25 years and was derived from a randomized controlled trial of early intervention services for individuals experiencing first-episode psychosis. All participants met diagnostic criteria for a psychotic disorder. The dataset included measures of negative symptoms, psychological variables, and social and occupational functioning, including structured activity. Although the data set was from a clinical trial, for the purposes of this study, only baseline data were used.

The PRODIGY sample consisted of 270 individuals aged 16-35 years with severe social disability and no history of psychotic disorder. Social disability in this cohort was characterized by low engagement in structured activity, reflecting significant impairment in functioning. The dataset provided detailed information on negative symptoms, structured activity measured in hours per week, and psychological variables. Although the data set was from a clinical trial, for the purposes of this study, only baseline data were used.

Participants were included if they were aged 16-35 years, belonged to either the SUPEREDEN3 or PRODIGY cohort, and had available baseline data on negative symptoms, structured activity, and relevant psychological measures. All participants included in the two source datasets fell within this age range; participants were excluded only if they had missing data on negative symptoms.

6.3 Power Considerations

As this study involved secondary analysis of existing datasets, a formal a priori sample size calculation was not conducted. However, both datasets were large and well-characterized, with a combined sample of 424 participants. This was considered sufficient to support the planned comparative analyses and to examine differences in negative symptoms, functioning, and psychological variables across groups. A post-hoc power analysis indicated that, at the conventional $\alpha = .05$ threshold, the chi-square comparisons ($N = 424$) had 80% power to detect an effect as small as $w = .14$, and the between-group comparisons within the MANOVA framework ($N = 328$) had 80% power to detect an effect as small as $d = .24$ (a small-to-medium effect). Under the more conservative Bonferroni-corrected threshold ($\alpha = .00056$) applied to guard against multiple testing (see Data Analysis), the sample provided 80% power to detect a somewhat larger effect ($w = .21$ for chi-square comparisons; $d = .37$ for between-group comparisons), indicating that the study remained adequately powered to detect small-to-medium effects even under this stricter threshold.

6.4 Ethical Considerations

This study involved secondary analysis of pre-existing, anonymized datasets and did not involve direct participant contact or new data collection. The original SUPEREDEN3 and PRODIGY trials received ethical approval from an NHS Research Ethics Committee prior to participant recruitment and data collection. Access to the anonymized datasets for the purposes of this secondary analysis was approved through the University of East Anglia's research governance procedures.

All data were fully anonymized prior to analysis, and no personally identifying information was accessible to the researcher at any stage. Data were stored securely on a password-protected, university-approved server in accordance with institutional data governance guidelines. Confidentiality was maintained by restricting dataset access to the research team and ensuring that all analyses were conducted on de-identified records. In reporting the findings, care was taken to minimize bias and ensure fair interpretation of comparisons between clinical groups.

6.5 Measures

Negative symptom severity was assessed using the Scale for the Assessment of Negative Symptoms (SANS; Andreasen, 1983), which evaluates five domains of negative symptoms: affective flattening or blunting, alogia, avolition/apathy, anhedonia/asociality, and attention difficulties. Each domain is rated on a global severity item scored from 0 (absent) to 5 (severe) based on a semi-structured clinical interview, with higher scores indicating greater negative symptom severity. Consistent with the two-factor model of negative symptoms proposed by Blanchard and Cohen (2006), the SANS domains were grouped into diminished expression and diminished motivation. Diminished expression comprised affective flattening and alogia, whereas diminished motivation comprised avolition/apathy and anhedonia/asociality. This classification is further supported by evidence demonstrating that these symptom domains can be organized into broader higher-order dimensions of diminished expression and motivation/pleasure (Ahmed et al., 2022). Attention was examined separately, as it is not included within contemporary negative symptom factor models.

Social and occupational functioning was assessed using the Time Use Survey (TUS; Hodgekins et al., 2015). The TUS measured the number of hours per week spent in work, education, or structured social and leisure activities. This provided an objective measure of functioning in daily life.

Symptoms of depression were measured using the Beck Depression Inventory-II (BDI-II; Beck et al., 1996), a 21-item self-report measure widely used to assess depressive symptom severity. Each item is scored from 0 to 3, producing a total score ranging from 0 to 63, with higher scores indicating more severe depressive symptoms. The BDI-II has demonstrated strong internal consistency and good convergent validity with other measures of depression (Beck et al., 1996).

Social anxiety was assessed using the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998), a 20-item self-report questionnaire that measures anxiety experienced in social interaction situations. Items are rated on a 5-point scale (0 = not at all characteristic, 4 =

extremely characteristic), yielding a total score with higher values reflecting greater social interaction anxiety. The SIAS has demonstrated good internal consistency and test-retest reliability (Mattick & Clarke, 1998).

Core schema beliefs were assessed using the Brief Core Schema Scales (BCSS; Fowler et al., 2006). The BCSS measures positive and negative beliefs about the self and others, producing four subscales: negative self, positive self, negative others, and positive others. Each item is rated for both belief endorsement and conviction, producing subscale scores where higher values indicate stronger endorsement of that belief domain. The BCSS has demonstrated good internal consistency and validity in both clinical and non-clinical populations (Fowler et al., 2006).

Hopelessness was assessed using the Beck Hopelessness Scale (BHS; Beck et al., 1974), a 20-item measure of negative expectations about the future. Items are answered in a true/false format, with total scores ranging from 0 to 20; higher scores indicate greater hopelessness. The BHS has demonstrated good internal consistency and predictive validity in clinical populations (Beck et al., 1974).

All measures used in this study were standardized instruments with established reliability and validity, making them suitable for assessing negative symptoms, psychological functioning, and structured activity across the two cohorts.

6.6 Data Analysis

All statistical analyses were conducted using IBM SPSS Statistics. Baseline data for negative symptoms, structured activity, and psychological variables were extracted from both the SUPEREDEN3 and PRODIGY datasets. Data from both datasets were harmonized to ensure that variables were measured and coded consistently across both cohorts.

Participants were categorized according to dataset membership, with SUPEREDEN3 representing the first-episode psychosis group and PRODIGY representing the severe social disability non-psychosis group. Negative symptoms were categorized into diminished motivation and diminished expression according to the two-factor SANS model. Participants

were classified as having high negative symptoms if they scored ≥3 on any relevant SANS global item, indicating at least moderate symptom severity. Participants scoring below this threshold were classified as having low negative symptoms.

Descriptive statistics were calculated for all baseline psychological measures and reported separately for PRODIGY and SUPEREDEN3.

Chi-square analyses were conducted to examine whether the proportion of participants classified as high or low on each SANS negative symptom dimension differed significantly between PRODIGY and SUPEREDEN3. Analyses were conducted separately for diminished expression, diminished motivation, and attention. Results were reported using chi-square statistics, degrees of freedom, and p-values.

Mann-Whitney U tests were conducted to compare psychological variables between low and high negative symptom groups within each Group. These analyses were conducted separately for diminished motivation and diminished expression. Mann-Whitney U tests were selected because several psychological variables showed non-normal distributions and some subgroup sizes were unequal. Results were reported as median and interquartile range, alongside the U statistic and p-value.

Rather than conducting a further series of pairwise between-study comparisons within each negative symptom subgroup, this question was instead addressed directly within the multivariate framework described below: the Study Group main effect and the Study Group × symptom severity interaction terms in each MANOVA test whether PRODIGY and SUPEREDEN3 participants differ on the combined set of psychological outcomes, both overall and conditional on negative symptom severity, while avoiding the substantially increased risk of Type I error associated with repeating pairwise comparisons across four subgroups and eight variables.

Two separate multivariate analyses of variance were conducted to examine the independent and combined effects of study group and negative symptom severity on baseline psychological outcomes. One MANOVA was conducted for diminished expression and one for diminished motivation.

Wilks' Lambda was reported as the multivariate test statistic, alongside the F-ratio, hypothesis degrees of freedom, p-value, and partial eta squared. Follow-up univariate tests were reported for each dependent variable separately. Box's Test of Equality of Covariance Matrices was examined before each MANOVA. For the diminished expression MANOVA, Box's Test was significant, indicating some violation of the homogeneity assumption; therefore, findings from this analysis were interpreted with caution. For the diminished motivation MANOVA, Box's Test was non-significant, supporting the assumption of homogeneity of covariance matrices. A significance threshold of $p < .05$ was applied throughout all analyses. Given the large number of statistical comparisons conducted across the study (chi-square, Mann-Whitney U, and MANOVA/univariate follow-up tests; $k = 89$ comparisons in total), a Bonferroni-corrected significance threshold of $p < .00056$ ($.05 \div 89$) was additionally applied to guard against inflated Type I error from multiple testing. Findings below are reported using the conventional $p < .05$ threshold, with results that also survive the Bonferroni-corrected threshold explicitly noted as such.

7. Missing Data

Prior to analysis, missing data were examined separately for each study using SPSS Missing Value Analysis. In PRODIGY, missing data were minimal across all variables (range: 0-7.0%). In SUPEREDEN3, missing data were more substantial, particularly for the BCSS subscales (14.3-17.5%) and BHS (13.0%), with TUS having no missing values in either study. Percent mismatch analysis indicated that missing values in SUPEREDEN3 tended to co-occur across BCSS subscales and BHS, suggesting a systematic pattern of non-response rather than random missingness. Listwise deletion was applied across all analyses, such that only participants with complete data on the relevant variables were included in each analysis. This caused a reduction in sample size from $N = 424$ to $N = 328$ in multivariate analyses, primarily attributable to incomplete BCSS and BHS data in SUPEREDEN3.

8. Results

Table 1 presents descriptive statistics for baseline psychological measures across the PRODIGY (n = 270) and SUPEREDEN3 (n = 154) samples. Measures include the Beck Depression Inventory-II (BDI-II), Social Interaction Anxiety Scale (SIAS), Beck Hopelessness Scale (BHS), Brief Core Schema Scales (BCSS; negative self, positive self, negative others, positive others), and the Time Use Survey (TUS). All measures except TUS are presented as mean and standard deviation (SD); TUS is reported as median and interquartile range (IQR) due to skewed distribution.

Participants in PRODIGY showed higher means in depression (BDI-II: 30.47 vs. 18.01), social anxiety (SIAS: 49.97 vs. 39.83), hopelessness (BHS: 13.07 vs. 8.90), and more negative self-schemas (BCSS negative self: 10.09 vs. 6.30) compared to SUPEREDEN3 participants. SUPEREDEN3 participants reported slightly higher positive self-schemas (7.89 vs. 5.22) and positive other-schemas (9.94 vs. 8.09). Structured activity (TUS) was comparable across both samples. Overall, PRODIGY participants showed numerically higher scores on most psychological variables at baseline; given that SUPEREDEN3 participants also present with a severe clinical picture (first-episode psychosis), this pattern was not necessarily anticipated and is examined further in the inferential analyses reported below.

Table 1.

Descriptive Statistics for Psychological Variables and Structured Activity Across PRODIGY and SUPEREDEN Participants (N = 424)

Variables	PRODIGY (n=270)	SUPEREDEN3 (n=154)
BDI-II, mean (SD)	30.47 (12.56)	18.01 (12.36)
SIAS, mean (SD)	49.97 (15.10)	39.83 (15.93)
BHS, mean (SD)	13.07 (5.48)	8.90 (5.09)
BCSS negative self, mean (SD)	10.09 (6.40)	6.30 (6.04)

BCSS positive self, mean (SD)	5.22 (4.45)	7.89 (5.79)
BCSS negative others, mean (SD)	8.53 (6.09)	7.92 (7.06)
BCSS positive others, mean (SD)	8.09 (5.44)	9.94 (6.45)
Time use Survey (TUS), median (IQR)	10.12 (12.83)	10.30 (13.48)

Note. BDI = Beck Depression Inventory-II; SIAS = Social Interaction Anxiety Scale; BHS = Beck Hopelessness Scale; BCSS = Brief Core Schema Scales; TUS = Time Use Survey. Values are presented as mean and standard deviation (SD), except TUS structured activity which is presented as median and interquartile range (IQR) due to skewed distribution.

Figure 1.

Percentage of High and Low Negative Symptoms Across SANS Global Domains by Group (N= 424)

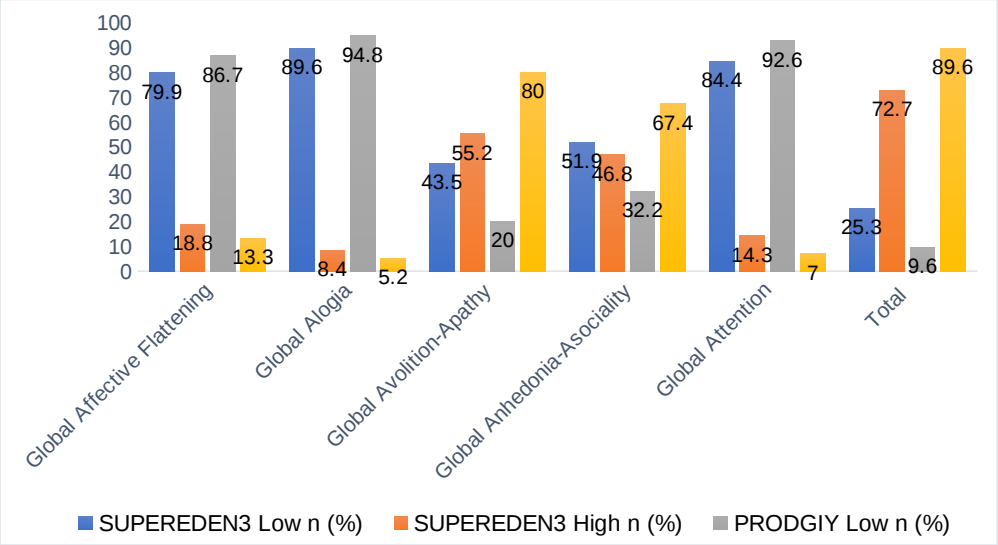

Figure 1 provides a descriptive overview of the proportion of participants classified as high versus low negative symptoms (cut-off score ≥ 3 on the relevant SANS global item) across the five original SANS domains, for descriptive context only. Formal statistical comparisons were conducted using the composite diminished expression, diminished motivation, and attention dimensions specified in the analysis plan, and are reported in Table 2 below.

Table 2.

Chi-Square Analysis of Diminished Expression, Diminished Motivation and Global attention Across SUPEREDEN and PRODIGY Groups (N= 424)

Variables	Group	Low n (%)	High n (%)	χ^2 (df)	*P*
Diminished Expression	PRODIGY	227 (84.1%)	43 (15.9%)	1.83 (1)	.176
	SUPEREDEN	119 (78.8%)	32 (21.2%)		
Diminished Motivation	PRODIGY	29 (10.7%)	241 (89.3%)	29.83(1)	<.001*
	SUPEREDEN	49 (32.2%)	103 (67.8%)		

Global attention	PRODIGY	250 (92.9%)	19 (7.1%)	6.06 (1)	.014*
	SUPEREDEN	130 (85.5%)	22 (14.5%)		

Note. SUPEREDEN (*n* = 154); PRODIGY (*n* = 270). High negative symptoms defined as SANS ≥ 3.

Chi-square analyses were conducted to examine group differences between SUPEREDEN and PRODIGY in diminished expression, diminished motivation, and global attention as presented in Table 2.

Chi-square analyses indicated a significant association between study group and diminished motivation, $\chi^2(1) = 29.83$, $p < .001$, which remained significant after Bonferroni correction (corrected $\alpha = .00056$). Participants in the PRODIGY cohort were significantly more likely to be classified as having high diminished motivation symptoms (89.3%) than participants in the SUPEREDEN3 cohort (67.8%).

An association was also observed between study group and global attention at the conventional threshold, $\chi^2(1) = 6.06$, $p = .014$; however, this did not survive Bonferroni correction (corrected $\alpha = .00056$) and should be interpreted with caution. A greater proportion of SUPEREDEN3 participants were classified as having high attention deficits (14.5%) compared with PRODIGY participants (7.1%).

In contrast, there was no significant association between study group and diminished expression, $p = .176$. This suggests that the proportion of participants with high and low levels of diminished expression did not differ significantly between the PRODIGY and SUPEREDEN3 cohorts.

Table 3.

Comparison of baseline psychological measures between low and high diminished motivation groups in PRODIGY and SUPEREDEN3 using Mann-Whitney U test (N= 424)

Variables	**PRODIGY**		**Test statistics**	***p***	**SUPEREDEN3**		**Test statistics**	***p***
	Low n=29	High n=241			Low n=49	High n=103		
BDI-II	28.0 (28.25)	31.0 (18.00)	U=2866	.194	13.50 (21.75)	19.00 (21.00)	U=1803	.036

SIAS	46.0 (30.50)	52.0 (22.00)	U=2731	.169	39.0 (20.25)	41.0 (24.0)	U=1781	.113
BHS	9.50 (13.50)	14.0 (8.0)	U=2373	.021	7.50 (6.50)	9.0 (9.0)	U=1520	.045
BCSS negative self	5.0 (14.0)	10.0 (9.0)	U= 2567	.035	3.0 (7.25)	6.0 (11.0)	U=1530	.061
BCSS positive self	5.0 (8.75)	4.0 (6.0)	U=2904	.679	7.50 (8.25)	7.0 (8.0)	U=1784	.678
BCSS negative other,	5.50 (5.50)	8.0 (9.0)	U=2825	.110	4.0 (9.25)	7.0 (11.0)	U=1503	.102
BCSS positive other	8.50 (8.0)	7.0 (8.0)	U=3042	.451	9.50 (8.50)	9.0 (9.0)	U=1775	.340
TUS	15.65 (14.09)	9.27 (11.30)	U=2239	.002	15.71 (9.67)	8.58 (11.36)	U=1988	.035

Note. Values represent median (IQR) for low and high diminished motivation groups. IQR = interquartile range; BDI-II = Beck Depression Inventory-II; SIAS = Social Interaction Anxiety Scale; BHS = Beck Hopelessness Scale; BCSS = Brief Core Schema Scales; TUS = Time use survey.

Table 4.

Comparison of baseline psychological measures between low and high diminished Expression groups in PRODIGY and SUPEREDEN3 using Mann-Whitney U test (N= 424)

Variables	**PRODIGY**		**Test statistics**	***p***	**SUPEREDEN3**		**Test statistics**	***p***
	Low n=227	High n=43			Low n=119	High n=32		
BDI-II	31.0 (19.0)	31.0 (20.0)	U=4328	.682	18.0 (21.0)	14.0 (19.50	U=1642	.390
SIAS	52.0 (21.50)	55.0 (23.0)	U=2816	.128	42.0 (23.0)	33.50 (23.0)	U=1187	.002
BHS	14.0 (9.0)	15.0 (9.0)	U=3916	.563	8.0 (9.0)	8.50 (7.50)	U=1131	.152

BCSS negative self	10.0 (10.0)	11.0 (12.0)	U= 3916	.572	5.0 (9.0)	3.0 (10.0)	U=1298	.870
BCSS positive self	5.0 (6.0)	3.0 (3.0)	U=4432	.658	7.0 (7.0)	8.50 (10.25)	U=1222	.864
BCSS negative other,	8.0 (9.0)	6.0 (9.0)	U=4611	.832	6.0 (13.0)	7.0 (10.50)	U=1187	.242
BCSS positive other	7.50 (8.0)	7.0 (5.0)	U=4696	.525	9.0 (8.0)	11.50 (12.50)	U=1386	.698
TUS	10.52 (13.12)	5.10 (8.67)	U=3953	.003	10.73 (13.97)	9.02 (11.81)	U=1535	.093

Note. Values represent median (IQR) for low and high diminished motivation groups. IQR = interquartile range; BDI-II = Beck Depression Inventory-II; SIAS = Social Interaction Anxiety Scale; BHS = Beck Hopelessness Scale; BCSS = Brief Core Schema Scales; TUS = Time use survey.

Mann-Whitney U tests were conducted to examine differences in baseline psychological measures between participants with low and high levels of diminished motivation (Table 3) and diminished expression (Table 4) within each cohort separately. The Mann-Whitney U test was selected because several psychological variables violated the assumption of normality and some subgroup comparisons involved unequal sample sizes, making a non-parametric approach more appropriate.

Diminished Motivation

In PRODIGY, the high diminished motivation group showed numerically greater hopelessness on the BHS (U = 2373, p = .021) and more negative self-schemas on the BCSS negative self-subscale (U = 2567, p = .035) compared with the low group, and the low diminished motivation group spent more time in structured activity as measured by the TUS (U = 2239, p = .002), with a higher median (15.65) than the high group (9.27). At the conventional α = .05 threshold these differences were statistically significant; however, none survived Bonferroni correction for the 89 comparisons conducted across the study (corrected α = .00056) and should therefore be interpreted as exploratory rather than robust findings. No differences, corrected or uncorrected, were observed for depression (BDI-II), social anxiety (SIAS), or the remaining BCSS subscales.

In SUPEREDEN3, the high diminished motivation group reported numerically greater depression on the BDI-II (U = 1803, p = .036) and greater hopelessness on the BHS (U = 1520, p

= .045) relative to the low group, and the low diminished motivation group engaged in more structured activity (TUS; U = 1988, p = .035), with a higher median (15.71) than the high group (8.58). As with the PRODIGY findings, these differences were significant at α = .05 but did not survive Bonferroni correction (corrected α = .00056) and should be interpreted with caution. No differences were found for social anxiety or the BCSS subscales.

Diminished Expression

Within the PRODIGY cohort, a difference was observed for structured activity as measured by the Time Use Survey (TUS), U = 3953, p = .003, with the low diminished expression group reporting greater engagement in structured activity (median = 10.52 hours) than the high diminished expression group (median = 5.10 hours); however, this did not survive Bonferroni correction (corrected α = .00056). No differences were observed for depression, social anxiety, hopelessness, or any of the core schema subscales.

Within the SUPEREDEN3 cohort, a difference was found for social anxiety as measured by the SIAS, U = 1187, p = .002, with participants with high diminished expression reporting lower social anxiety (median = 33.50) than those with low diminished expression (median = 42.00); this difference did not survive Bonferroni correction (corrected α = .00056) and should be interpreted cautiously. No other psychological measures differed between groups at either threshold (all p > .05).

Rather than conducting a further series of pairwise between-study comparisons across each negative symptom subgroup, group differences between PRODIGY and SUPEREDEN3 were instead examined directly within the multivariate framework reported below, consistent with the analysis plan described above.

Table 5.

Multivariate Tests for Effects of Study Group, SANS Expression, and Their Interaction on Baseline Outcome Measures (N= 328)

Effect	Wilks' λ	F	Hyp. *df*	*p*	Partial η^2
Study group	.839	7.59	8, 317	<0.001	.161

SANS Expression (high vs low)	.972	1.14	8, 317	.339	.028
Study group × SANS Expression	.976	0.96	8, 317	.464	.024

Note. Wilks' Lambda is reported. Box's Test was significant (p = .029), indicating some violation of homogeneity of covariance matrices; results should be interpreted with caution. N = 328.

Table 5.1

Univariate Between-Subjects Effects for Study Group and SANS Expression severity, and Their interaction on Baseline Outcome Measures

Dependent variables	Study group			Symptom severity			Interaction		
	F (1,324)	p	η^2_p	F (1,324)	p	η^2_p	F (1,324)	p	η^2_p
BDI-II	42.24	<.001	.115	.232	.631	.001	0.01	.904	.000
SIAS	28.78	<.001	.082	1.02	.314	.003	3.06	.082	.009
BHS	29.53	<.001	.084	0.57	.811	.000	0.32	.572	.001
BCSS negative self	18.40	<.001	.054	0.00	.977	.000	0.36	.547	.001
BCSS positive self	19.74	<.001	.057	0.00	.995	.000	2.00	.159	.006
BCSS negative other	0.00	.985	.000	0.09	.754	.000	0.77	.382	.002
BCSS positive other	8.98	.003*	0.27	1.04	.310	.003	2.33	.130	.007
TUS	0.48	.487	.001	6.05	.014*	.018	0.67	.413	.002

Note. BDI = Beck Depression Inventory; SIAS = Social Interaction Anxiety Scale; BHS = Beck Hopelessness Scale; BCSS = Brief Core Schema Scales; TUS = Time Use Survey. η^2_p = partial eta squared. All univariate F values based on df = (1, 324). Interaction = Study group × SANS Expression. No significant interactions were found. *N* = 328.

Table 5 presents result from a one-way multivariate analysis of variance (MANOVA) examining the effect of study group (PRODIGY vs. SUPEREDEN3), SANS expression severity (high vs. low), and their interaction on baseline psychological outcome measures (BDI-II, SIAS, BHS, BCSS subscales, and TUS; *N* = 328). Wilks' Lambda (λ) is reported as the multivariate test statistic, alongside the associated *F*-ratio, hypothesis degrees of freedom, *p*-value, and partial eta squared (η^2p) as a measure of effect size. Univariate between-subjects *F*-tests are reported separately for each dependent variable.

At the multivariate level, there was a significant main effect of study group, Wilks' λ = .839, F(8, 317) = 7.59, p < .001, partial η^2p = .161, which survived Bonferroni correction (corrected α = .00056), indicating that PRODIGY and SUPEREDEN3 participants differed significantly across the combined set of psychological outcome measures. In contrast, there was no significant multivariate effect of diminished expression severity, Wilks' λ = .972, F(8, 317) = 1.14, p = .339, partial η^2p = .028, suggesting that participants with high and low diminished expression did not differ significantly across the outcomes when considered together. The interaction between study group and diminished expression severity was also non-significant, Wilks' λ = .976, F(8, 317) = 0.96, p = .464, partial η^2p = .024, indicating that the relationship between diminished expression and psychological outcomes was similar across both cohorts.

Box's Test of Equality of Covariance Matrices was significant (p = .029), indicating some violation of the assumption of homogeneity of covariance matrices. Therefore, the multivariate findings should be interpreted with caution.

Follow-up univariate analyses (Table 5.1) showed study group differences that survived Bonferroni correction (corrected α = .00056) for depression (BDI-II), social anxiety (SIAS), hopelessness (BHS), negative self-schemas, and positive self-schemas (all p < .001). The difference in positive other schemas (p = .003) was significant at the conventional threshold but did not survive Bonferroni correction. Overall, PRODIGY participants reported greater psychological difficulties than SUPEREDEN3 participants across most of these measures. No differences were observed for negative other schemas or structured activity (TUS).

There were no significant univariate effects of diminished expression severity for any psychological measure at the conventional threshold. The only exception was structured activity (TUS), $F(1, 324) = 6.05$, $p = .014$, $\eta^2p = .018$; however, this difference did not survive Bonferroni correction (corrected $\alpha = .00056$) and should be interpreted with caution.

No significant interaction effects were observed for any outcome measure, suggesting that the associations between diminished expression and psychological outcomes were similar in both cohorts.

Table 6

Multivariate Tests for Effects of Study Group, SANS Motivation, and Their Interaction on Baseline Outcome Measures (N = 328)

Effect	*Wilks' λ*	F	*Hyp. df*	p	Partial η^2
Study group	.872	5.81	8, 317	<.001	.128
SANS Motivation (high vs low)	.914	3.73	8, 317	<.001	.086
Study group × SANS Motivation	.983	.68	8, 317	.708	.017

Note. Wilks' Lambda is reported. Box's Test was non-significant ($p = .072$), supporting homogeneity of covariance matrices.

Table 6.1

Univariate Between-Subjects Effects for Study Group and SANS Motivation Severity, and Their Interaction on Baseline Outcome Measures

Dependent Variables	Study group			Symptom severity			Interaction		
	F	*p*	η^2_p	F	*p*	η^2_p	F	*p*	η^2_p

	(1324)			(1324)			(1324)		
BDI-II	39.80	<.001	.109	6.24	.013*	.019	0.08	.775	.000
SIAS	12.66	<.001	.038	2.86	.092	.009	0.73	.393	.002
BHS	15.20	<.001	.045	7.67	.006*	.023	1.75	.187	.005
BCSS negative self	11.72	<.001	.035	6.81	.009*	.021	0.01	.932	.000
BCSS positive self	12.74	<.001	.038	0.97	.325	.003	0.09	.763	.000
BCSS negative other	0.06	.806	.000	4.75	.030*	.014	0.02	.880	.000
BCSS positive other	3.76	.053	.011	0.24	.626	.001	0.02	.888	.000
TUS	0.86	.355	.003	16.26	<.001	.048	0.01	.942	.000

Note. Wilks' Lambda is reported for the multivariate test. Box's Test was non-significant (p = .072), supporting homogeneity of covariance matrices. All univariate F values based on df = (1, 324). BDI-II = Beck Depression Inventory-II; SIAS = Social Interaction Anxiety Scale; BHS = Beck Hopelessness Scale; BCSS = Brief Core Schema Scales; TUS = Time Use Survey. (N=328) * p < .05.

Tables 6 present results from a MANOVA examining the effects of study group, SANS motivation severity (high vs. low), and their interaction on the same set of baseline psychological outcomes (N = 328). Box's Test of Equality of Covariance Matrices was non-significant (p = .072), supporting the assumption of homogeneity of covariance matrices and indicating that parametric inference is appropriate.

At the multivariate level, a significant main effect of study group was found (Wilks' λ = .872, $F(8, 317) = 5.81$, $p < .001$, partial η^2p = .128), which survived Bonferroni correction (corrected α = .00056), replicating the pattern observed in the diminished expression MANOVA and confirming that the two studies differ significantly across the combined outcomes. A significant main effect of SANS motivation severity was also observed (Wilks' λ = .914, $F(8, 317) = 3.73$, $p < .001$, partial η^2p = .086; exact p = .00035, narrowly surviving Bonferroni correction),

indicating that high and low motivation groups differed across baseline psychological measures with a medium effect size. The interaction between study group and motivation severity was non-significant (Wilks' λ = .983, F(8, 317) = .68, p = .708, partial η^2p = .017), suggesting that the pattern of associations between motivation and psychological measures was consistent across both studies.

Univariate follow-up tests (Table 6.1) revealed study group effects for BDI-II (F(1, 324) = 39.80, p < .001), SIAS (F(1, 324) = 12.66, p < .001), BHS (F(1, 324) = 15.20, p < .001), and BCSS positive self (F(1, 324) = 12.74, p < .001), all of which survived Bonferroni correction (corrected α = .00056). The study group effect for BCSS negative self (F(1, 324) = 11.72, p < .001; exact p = .0007) was significant at the conventional threshold but narrowly failed to survive Bonferroni correction. For SANS motivation severity, effects were found for BDI-II (F(1, 324) = 6.24, p = .013), BHS (F(1, 324) = 7.67, p = .006), BCSS negative self (F(1, 324) = 6.81, p = .009), and BCSS negative other (F(1, 324) = 4.75, p = .030); none of these survived Bonferroni correction and should be interpreted as exploratory. The effect of SANS motivation severity on TUS (F(1, 324) = 16.26, p < .001; exact p < .0001) did survive Bonferroni correction, indicating a robust association between diminished motivation and reduced engagement in structured activity. No interaction effects were found for any dependent variable.

After accounting for multiple testing, the clearest and most robust finding was that diminished motivation was associated with reduced engagement in structured activity, a relationship that survived Bonferroni correction in both the univariate follow-up test above and the within-cohort comparisons reported earlier. The associations between diminished motivation and depression, hopelessness, and negative self- and other-schemas were significant at the conventional α = .05 threshold but did not survive correction, and should therefore be treated as preliminary rather than confirmed findings. The non-significant interaction effect indicates that, to the extent these associations exist, they appear similar across both the PRODIGY and SUPEREDEN3 cohorts, consistent with a transdiagnostic pattern.

9. Discussion

This study examined differences in negative symptom profiles between two distinct clinical populations PRODIGY, a sample of young people with emerging severe mental illness, and SUPEREDEN3, a sample of young people with First episode Psychosis. This

study also explored psychological and functioning differences between two clinical samples with respect to negative symptom dimensions of diminished motivation and diminished expression.

Analyses compared depression, social anxiety, hopelessness, core schema beliefs, and levels of structured activity across groups and between participants with high and low levels of negative symptoms. Findings indicated that PRODIGY and SUPEREDEN3 participants differed significantly in the severity of diminished motivation — with PRODIGY showing a markedly higher rate of high motivational deficits than SUPEREDEN3 — and that this difference was associated with distinct patterns of psychological correlates across the two groups.

Negative Symptom Profiles: Differences Between PRODIGY and SUPEREDEN3

The primary finding of this study was a significant between-group difference in diminished motivation, with PRODIGY participants demonstrating markedly higher rates of high motivational deficits (89.3%) compared with SUPEREDEN3 participants (67.8%), $\chi^2(1) = 29.83$, $p < .001$ — a difference that survived Bonferroni correction for multiple testing and represents the most statistically robust finding of this study. These findings suggest that motivational deficits may be clinically relevant beyond psychotic disorders and support emerging transdiagnostic perspectives of negative symptoms.

Strauss and Cohen (2017), proposed that symptoms such as avolition, anhedonia and social withdrawal occur across multiple psychiatric disorders and are associated with impairments in motivation, emotional experience and social functioning. Similarly, Ihler et al. (2023) argued that negative symptoms represent transdiagnostic phenomena linked with reduced quality of life and functional impairment across diagnostic categories.

The greater burden of motivational impairment observed in the non-psychotic PRODIGY cohort may reflect the high prevalence of affective and anxiety-related difficulties within this group, where amotivation, social withdrawal and reduced goal-directed behavior may overlap substantially with negative symptom presentations. These findings therefore support the possibility that diminished motivation reflects a broader, transdiagnostic dimension of psychopathology rather than a phenomenon specific to

psychotic illness, consistent with existing transdiagnostic accounts of negative symptoms (Strauss & Cohen, 2017; Guineau et al., 2022; Ihler et al., 2023).

In contrast, no significant between-group differences were observed for diminished expression (PRODIGY: 15.9% high vs. SUPEREDEN3: 21.2%) indicating comparable levels of expressive deficits across both samples. This finding contrasts with previous research suggesting that blunted affect and alogia are more strongly associated with psychosis-spectrum disorders. For example, De Pieri et al. (2024) reported significantly greater levels of diminished expression symptoms in schizophrenia-spectrum disorders compared with bipolar disorder.

However, the absence of group differences in the present study may reflect the severe social disability and functional impairment characterizing the PRODIGY cohort, which may also contribute to reduced emotional expression, limited communication and social disengagement despite the absence of psychosis. These findings suggest that expressive deficits may not be entirely specific to psychotic disorders and may be present in young people experiencing significant psychological and social difficulties.

Psychological Correlates of Negative Symptom Dimensions

The present findings suggest that the two dimensions of negative symptoms were associated with different patterns of psychological functioning. Diminished motivation showed the most robust association with functional outcomes: across both cohorts, higher levels of diminished motivation were associated with lower engagement in structured activity, and this relationship survived correction for multiple testing. Associations between diminished motivation and greater hopelessness were observed at the conventional significance threshold but did not survive Bonferroni correction, and should therefore be considered preliminary. The structured-activity finding is nonetheless consistent with previous research linking the avolition-apathy dimension of negative symptoms — a core component of diminished motivation, alongside anhedonia-asociality — to poorer psychosocial functioning and reduced real-world engagement (Faerden et al., 2009, 2010; Foussias et al., 2009, 2010; Garcia-Fernandez et al., 2022).

At the conventional significance threshold, participants with high diminished motivation also reported greater hopelessness and more negative self-schemas; however, these associations did not survive Bonferroni correction and should be interpreted with caution. If replicated in adequately powered future studies, such a pattern would be broadly consistent with cognitive models of negative symptoms, which propose that dysfunctional beliefs and negative self-appraisals contribute to the development and maintenance of motivational difficulties (Saperia et al., 2025).

If this pattern is confirmed in future, adequately powered research, it would suggest that hopelessness and negative self-beliefs may reduce motivation, discourage goal-directed behavior, and contribute to ongoing social withdrawal. The present study's most robust psychological-correlate finding — the association between diminished motivation and reduced structured activity — nonetheless supports the broader proposal that motivational deficits and functional impairment are closely linked across diagnostic groups.

In contrast, diminished expression demonstrated a more limited pattern of associations with psychological functioning. No significant relationships were found between diminished expression and depression, hopelessness, or core schema beliefs, and the MANOVA revealed no overall effect of diminished expression on the combined psychological outcomes. The only significant findings were lower structured activity among participants with high diminished expression in PRODIGY and lower social anxiety among participants with high diminished expression in SUPEREDEN3.

The inverse association between diminished expression and social anxiety in SUPEREDEN3 was unexpected, did not survive Bonferroni correction for multiple testing, and should be interpreted cautiously given the relatively small size of the high-expression subgroup. One possible explanation is that some individuals suppress or conceal emotional distress, resulting in reduced emotional expression despite experiencing underlying anxiety. One possible explanation is that individuals with high diminished expression may engage in emotional suppression as a strategy for regulating distressing emotions and social-evaluative concerns and may present with lower reported social anxiety on a self-report measure like the SIAS. Consistent with this interpretation,

Spokas et al. (2009) found that social anxiety is associated with greater use of emotional suppression which may contribute to reduced emotional expression and limited social communication. However, this finding differs from Gupta et al. (2021), who reported that higher anxiety was associated with greater blunted affect. Further research is required to clarify the relationship between social anxiety and diminished expression in early psychosis populations.

Psychological Differences Across Negative Symptom Subgroups

A key finding of the study was that psychological differences between PRODIGY and SUPEREDEN3 persisted even when participants were matched on negative symptom severity. Across both high diminished motivation and high diminished expression groups, PRODIGY participants reported greater depression, social anxiety, hopelessness, and more negative self-schemas, whereas SUPEREDEN3 participants reported more positive self- and other-schemas. These differences were also evident among participants with low levels of negative symptoms, suggesting that the PRODIGY cohort experienced greater psychological distress regardless of negative symptom severity. Notably, these between-cohort (study group) differences were robust to Bonferroni correction for multiple testing, unlike several of the within-cohort negative-symptom-severity comparisons discussed above.

The more severe psychological profile observed in PRODIGY may reflect the broader emotional and social difficulties characterizing this cohort. Maladaptive schemas have been linked to depression and anxiety in adolescents and young adults (Tariq, 2023), and negative self-beliefs may contribute to the greater emotional distress observed in PRODIGY participants.

Another notable finding was that SUPEREDEN3 participants reported more positive self- and other-schemas despite experiencing first-episode psychosis. Although psychosis has generally been associated with less positive self-beliefs compared with healthy controls (Jorovat et al., 2025), the present study compared two clinically distressed populations rather than a psychosis group and healthy controls. The more positive schemas observed in SUPEREDEN3 may therefore reflect the comparatively

greater emotional distress, hopelessness, and negative self-beliefs reported by the PRODIGY cohort.

Importantly, no significant interactions were observed between study group and either diminished motivation or diminished expression. This indicates that the associations between these negative symptom dimensions and psychological outcomes were broadly similar across both cohorts. Although PRODIGY participants consistently reported greater overall psychological distress, the relationship between negative symptom severity and psychological functioning did not differ significantly between groups. These findings support transdiagnostic models of negative symptoms, suggesting that the psychological processes associated with diminished motivation and diminished expression may operate similarly across psychotic and non-psychotic populations.

Structured Activity as a Transdiagnostic Functional Marker

The association between negative symptom severity and lower engagement in structured activity is consistent with previous research identifying functional decline as a key consequence of negative symptoms. Chang et al. (2016) found that avolition predicted poorer functional outcomes in individuals with first-episode schizophrenia-spectrum disorders. Research has also shown that negative symptoms are associated with poorer functioning in young people at risk of psychosis (Devoe et al., 2020, 2021; Hodgekins, Birchwood, et al., 2015b; Schlosser et al., 2012). Together, these findings support the current results, which suggest that greater negative symptom severity, particularly diminished motivation, is associated with reduced structured activities. This structured-activity finding was also the most statistically robust result in the present study, surviving Bonferroni correction across all analyses conducted.

The finding that structured activity was associated with negative symptom severity but not study group suggests that reduced engagement in meaningful daily activities may reflect a common functional consequence of negative symptoms across both psychotic and non-psychotic populations. This finding further supports transdiagnostic models of negative symptoms, which emphasize impairments in motivation, social engagement, and functioning across diagnostic categories.

10. Strengths and Limitations

The study makes a novel contribution by directly comparing negative symptoms between a non-psychotic clinical cohort (PRODIGY) and a first-episode psychosis cohort (SUPEREDEN3), addressing an important gap in the literature regarding the transdiagnostic nature of negative symptoms.

A further strength is that the sample drawn from two well-characterized clinical cohorts, which enhanced the robustness of the findings and enabled meaningful subgroup analyses. The distinction between diminished motivation and diminished expression provided a more nuanced understanding of negative symptom presentations, consistent with contemporary conceptualizations of negative symptoms.

Additionally, the inclusion of depression, social anxiety, hopelessness, schemas and structured activity allowed for a comprehensive examination of the emotional, cognitive and functional correlates of negative symptoms.

Despite these strengths, several limitations should be acknowledged. First, some data were missing, particularly within the SUPEREDEN3 dataset. Missing responses were most common for the schema (BCSS) and hopelessness (BHS) measures, resulting in a reduction in the final sample size used for some analyses. Because participants with missing data were excluded from analyses, statistical power may have been reduced, particularly for comparisons involving SUPEREDEN3. Consequently, some non-significant findings should be interpreted with caution, as they may reflect reduced power rather than a true absence of differences.

Second, as a secondary data analysis, the study was restricted to measures available within the original datasets. Furthermore, because PRODIGY and SUPEREDEN3 were derived from separate studies with different recruitment procedures and clinical contexts, unmeasured differences between cohorts may have influenced the findings.

Finally, several psychological variables were assessed using self-report measures, which may be susceptible to response biases and shared method variance.

Finally, given the large number of statistical tests conducted across this study, a Bonferroni correction was applied to reduce the risk of Type I error. While methodologically conservative, this correction meant that several findings significant at the conventional α = .05 threshold — including most of the within-cohort associations between diminished motivation and hopelessness or negative self-schemas — did not survive correction and should be treated as preliminary. Future research with pre-registered, more focused hypotheses and fewer planned comparisons would allow these associations to be tested with greater statistical power and without such a stringent correction.

11. Clinical Implications

The findings of the present study have important clinical implications. The results demonstrate that negative symptoms, particularly diminished motivation, are not confined to first-episode psychosis but are also present in young people with non-psychotic mental health difficulties and severe social disability.

Furthermore, PRODIGY participants consistently reported greater depression, social anxiety, hopelessness and negative self-schemas than SUPEREDEN3 participants, suggesting that negative symptoms in non-psychotic populations may occur within a broader context of emotional distress and maladaptive cognitive beliefs.

These findings highlight the importance of routinely assessing negative symptoms across a wider range of clinical populations rather than restricting their assessment to psychosis services. The consistent association between negative symptoms and reduced structured activity across both cohorts further suggests that motivational deficits represent an important treatment target irrespective of diagnostic status. Interventions that promote behavioral engagement, increase participation in meaningful activities and address maladaptive beliefs may therefore help reduce the functional impact of negative symptoms across both psychotic and non-psychotic populations.

12. Future Directions

The present study raises several important questions for future research. First, given that PRODIGY participants, representing a non-psychotic population with severe social disability, demonstrated greater psychological difficulties on most measures than SUPEREDEN3 participants with first-episode psychosis, future research should investigate the mechanisms underlying this pattern.

It is possible that the greater psychological burden observed in PRODIGY reflects the emotional distress and functional difficulties associated with severe social disability. Alternatively, factors such as hopelessness and negative self-schemas may contribute to the development and maintenance of negative symptoms. Longitudinal studies are needed to clarify the direction and timing of these relationships and to examine how negative symptoms evolve over time across different clinical populations.

Second, the distinct patterns observed for diminished motivation and diminished expression highlight the need for further research into whether these dimensions have different prognostic and treatment implications. Future studies should directly compare psychotic and non-psychotic populations using consistent assessment methods to better understand similarities and differences in negative symptom presentation.

Given the substantial missing data in SUPEREDEN3, future research should prioritize robust data collection procedures and consider appropriate methods, such as multiple imputation, for handling missing data. Future studies would also benefit from pre-specifying a smaller number of primary hypotheses, reducing the reliance on stringent multiple-testing correction and increasing power to detect true effects.

Finally, future research involving larger samples drawn from a more diverse range of psychotic and non-psychotic populations — beyond the two cohorts examined here — would improve the generalizability of findings and provide a stronger evidence base for developing symptom-targeted interventions for young people experiencing negative symptoms.

Conclusion:

In conclusion, this study provides novel evidence that diminished motivation, but not diminished expression, differs significantly between young people with first-episode psychosis (SUPEREDEN3) and those with non-psychotic mental health difficulties and severe social disability (PRODIGY), with PRODIGY participants showing markedly higher rates of motivational deficits. This between-cohort difference in diminished motivation, together with the association between diminished motivation and reduced structured activity, represented the most

statistically robust findings of this study after accounting for multiple testing. PRODIGY participants also reported greater psychological distress across depression, social anxiety, hopelessness, and negative self-schemas than SUPEREDEN3 participants, regardless of negative symptom severity. Together, these findings support a transdiagnostic conceptualization of negative symptoms, particularly diminished motivation, and highlight the clinical value of assessing and targeting motivational deficits across both psychotic and non-psychotic populations.

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