Subdomains Within the Negative Symptoms of Schizophrenia: Commentary

Brian Kirkpatrick1,2 and Bernard Fischer3

2Department of Psychiatry and Health Behavior, Medical College of Georgia; 3Department of Psychiatry, University of Maryland

Key words: blunted affect/poverty of speech/negative symptoms/rating scales/psychometrics

In an accompanying article in this theme issue, Blanchard and Cohen review the evidence on the relationships among negative symptoms and conclude that meaningful subdomains within negative symptoms may exist. Specifically, they suggest that blunted affect and poverty of speech may form one such subdomain, and anhedonia, asociality, and avolition may form another. The authors are appropriately cautious in raising this possibility, and they suggest further studies would be needed before it is confirmed.

Should the independence of these 2 factors be confirmed, it would have implications for research on negative symptoms. At the Consensus Development Conference on Negative Symptoms, sponsored by the National Institute of Mental Health and held in Rockville, Maryland, on January 26–27, 2005, one of us (Kirkpatrick) presented a review of the literature on blunted affect. From the starting point of that presentation, a pattern consistent with the existence of separate subdomains similar to those cited by Blanchard and Cohen emerged. We briefly summarize that presentation and discuss some of the issues involved in conducting research on the existence of separate factors within negative symptoms.

Blunted Affect

All of the widely used negative symptom rating and categorization instruments include blunted or restricted affect. Blunted affect can be considered to have 3 components: (1) decrease in facial expression; (2) decrease in expressive gestures and other body language; and (3) decrease in modulation of the volume, pitch, and speed of speaking. Blunted affect should be distinguished from flat affect, which refers to the extreme end of the spectrum of blunting. Items for “decreased spontaneous movements” and/or “poor eye contact” are included in some blunted affect subscales; in factor analyses these correlate with the core features of blunted affected but are not part of the same construct.

Blunted affect can be found in several disorders other than schizophrenia, including Parkinson’s disease, depression, autism, vascular dementia, and multiple system atrophy. In the context of schizophrenia, antipsychotic medications complicate the assessment of blunted affect, as they can induce this symptom (although this is much less of a problem with second-generation drugs than with the first generation).

Data at the Item Level

In Table 1, we summarize the studies that provided data at the item level of the relationships within negative symptoms. Only studies with schizophrenia subjects were included. We omitted studies that used scales that included symptoms other than negative symptoms. Consistent with the review of Blanchard and Cohen,1 these studies suggest that blunted affect and poverty of speech have a particularly strong relationship and may constitute a domain with some independence from other domains within negative symptoms. Four of 5 publications that were based on 1 negative symptom rating scale found blunted affect loading onto the same factor as poverty of speech9–12,11; each of these studies found more than 1 negative symptom factor. Another study evaluated 2 scales in the same population; for both scales blunted affect and poverty of speech loaded onto the same factor.14 A study based on the Schedule for the Deficit Syndrome (SDS) that did not use factor analysis found that the blunted affect and poverty of speech items had a (Spearman) correlation of $r = 0.84$, compared with other bivariate item correlations of 0.48 to 0.68.15

Several aspects of these studies support the generalizability of the finding of a particularly strong relationship between blunted affect and poverty of speech. There is relatively good consistency across these studies, which come from both the United States and Europe and used 4 different instruments. The SDS-based study of Kimhy et al.11—which included only those patients judged to have primary negative symptoms—as well as the study of Kirkpatrick et al.15—which included patients with and without primary negative symptoms—both...
Table 1. Studies of Blunted Affect and Poverty of Speech

<table>
<thead>
<tr>
<th>Reference</th>
<th>N</th>
<th>Instrument</th>
<th>Factor Structure</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Studies Showing a Particularly Strong Relationship</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peralta and Cuesta 1995&lt;sup&gt;12&lt;/sup&gt;</td>
<td>253</td>
<td>SANS</td>
<td>2- and 3-factor solutions account for &gt; 50% of variance; for these, “Unchanging Facial Expression” and “Poverty of Speech” loaded on same factor. 5-factor solution had the best fit, and the 2 items were not on the same factor. Affective Flattening and Alogia Subscales correlation: $ r = 0.76 $ (other subscales ranged 0.22–0.69). ICC for “Unchanging Facial Expression” item 0.88, “Poverty of Speech” item 0.85. (Range: 0.59–0.92, 8 of 20 items having ICC $\geq 0.85$.)</td>
<td></td>
</tr>
<tr>
<td>de Leon, Peralta, and Cuesta 1993&lt;sup&gt;14&lt;/sup&gt;</td>
<td>115</td>
<td>SANS</td>
<td>5-factor solution; “Unchanging Facial Expression” and “Poverty of Speech” both load on “Poverty of Affect and Speech” factor. ICC for 30 patients ranged from 0.59 to 0.92, 17 of 20 items $\geq 0.75$.</td>
<td></td>
</tr>
<tr>
<td>Keefe et al. 1992&lt;sup&gt;10&lt;/sup&gt;</td>
<td>130</td>
<td>SANS</td>
<td>3-factor solution; “Unchanging Facial Expression” and “Poverty of Speech” both load on “Diminished Expression” factor. Item-item correlation between “Unchanging Facial Expression” and “Poverty of Speech”: $ r = 0.53 $. (Range: −0.08 to 0.70, 13 of 78 correlations $&gt; 0.53$.)</td>
<td></td>
</tr>
<tr>
<td>de Leon, Peralta, and Cuesta 1993&lt;sup&gt;14&lt;/sup&gt;</td>
<td>115</td>
<td>SEB</td>
<td>3-factor solution; “Expressionless Face” and “Paucity of Thought” both load on “Poverty of Affect and Speech” factor. ICC for 30 patients ranged from 0.44 to 0.95, 13 of 16 items $\geq 0.75$.</td>
<td></td>
</tr>
<tr>
<td>Alphs et al. 1989&lt;sup&gt;9,a&lt;/sup&gt;</td>
<td>100</td>
<td>NSA</td>
<td>7-factor solution; “Blank, Expressionless Face” and “Restricted Speech Quantity” both load on “Affect/ Emotion” factor.</td>
<td></td>
</tr>
<tr>
<td>Kimhy et al. 11&lt;sup&gt;11&lt;/sup&gt;</td>
<td>52</td>
<td>SDS</td>
<td>2-factor solution; “Restricted Affect” and “Poverty of Speech” both loaded on “Expressive Prosody” factor. All subjects with Deficit Syndrome.</td>
<td></td>
</tr>
<tr>
<td>Kirkpatrick et al. 1989&lt;sup&gt;15&lt;/sup&gt;</td>
<td>40</td>
<td>SDS</td>
<td>n/a</td>
<td>Item-item correlation between “Restricted Affect” and “Poverty of Speech”: $ r = 0.84 $ (other items ranged 0.48–0.68).</td>
</tr>
<tr>
<td><strong>Studies Failing to Show a Particularly Strong Relationship</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axelrod et al. 1994&lt;sup&gt;13&lt;/sup&gt;</td>
<td>223</td>
<td>NSA</td>
<td>6-factor solution; “Blank, Expressionless Face” loads on “Emotion/Affect” factor; “Restricted Speech Quantity” loads on “Communication” factor. “Emotion/Affect” and “Communication” correlation: $ r = 0.64 $ (for other factors 0.37–0.89; 6 of the remaining 14 comparisons $&gt; 0.64$).</td>
<td></td>
</tr>
</tbody>
</table>

Note: ICC = Intraclass Correlation Coefficient; NSA = Negative Symptom Assessment; SANS = Scale for Assessment of Negative Symptoms; SDS = Schedule for the Deficit Syndrome; SEB = Scale for Emotional Blunting.

<sup>a</sup>Included schizoaffective and schizophrenia patients. All other studies were restricted to schizophrenia patients.
supported the existence of a particularly strong relationship between blunted affect and poverty of speech. The other studies were based on instruments that are not intended to distinguish primary versus secondary symptoms, providing further support for the generalizability of the conclusion.

Future Research

Taken together, the studies cited above and the review of Blanchard and Cohen1 suggest that blunted affect has a particularly strong relationship to poverty of speech, with these 2 features forming an “expressivity” domain within negative symptoms. The reported independence of social skills and subjective experience from blunted affect16,17 is also consistent with the existence of multiple factors within negative symptoms.

Flat or blunted affect alone has sometimes been used as an independent variable in studies of course, psychopathology, and neurobiology, and in some contexts it has been a significant predictor of other variables.18–22 However, in most studies the potential for confounding by other negative symptoms has not been considered, so the specificity of the relationships with blunted affect is not clear. The study of Gur et al.23 in this issue is a notable exception. We are not aware of any published studies that have considered the correlates of an expressivity factor and an anhedonia/asociality factor separately, although at the Consensus Development Conference, Malaspina presented data suggesting that these factors do have different correlates.

It would not be difficult to test the hypothesis that these factors have different correlates by conducting secondary analyses. In many studies for which negative symptoms are an important dependent variable, expressivity and anhedonia/asociality factor scores can be derived from the Scale for Assessment of Negative Symptoms (SANS) and some other negative symptom rating scales. For instance, blunted affect is very similar to the neurological concept of aprosodia; thus, the anatomical organization of aprosodia provides a conceptual framework for developing hypotheses about the putative expressivity component of negative symptoms.24–30 In most subjects, prosody appears to be under the control of areas in the right hemisphere, with an organization that mirrors that of propositional language in the left, such that separate areas control emotional (versus propositional) expression and comprehension. That is, both expressive and receptive aprosias exist, with a right-sided anatomical organization that mirrors that of expressive and receptive aphasias in the left hemisphere.

Propositional and affective components of language are thought to be integrated in the brainstem and via the corpus callosum. A smaller volume of the corpus callosum was associated with negative symptoms in two studies,31,32 although not in a third.33 Is the volume of the corpus callosum related to the severity of expressivity factor but not to an anhedonia/asociality/avolition factor?

More generally, are other variables related to negative symptoms linked exclusively or primarily to 1 of the 2 factors described by Blanchard and Cohen?9 What about cognitive function or regional brain activation in schizophrenia, or subclinical negative symptoms in the relatives of probands with schizophrenia?

Conclusion

The psychometric association of blunted affect and poverty of speech raises the possibility that an expressivity factor has an independence from other negative symptoms that extends to course of illness, treatment response, and neurobiology. In analyses of negative symptoms, an additional analysis of an expressivity factor versus other negative symptoms would add little additional work but may improve our understanding of negative symptoms and schizophrenia.

References


17. Myin-Germeys I, Delespaul PAEG, deVries MW. Schizophrenia patients are more emotionally active than is assumed based on their behavior. *Schizophr Bull.* 2000;26:847–854.


