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Invited commentary

We need to make progress on blunted affect: A commentary

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Approximately 30 % of individuals with schizophrenia have significant blunted affect (Bobes et al., 2010) - a decrease in expression through nonverbal (but sometimes including vocal expressivity, e.g. Ventura et al., 1993) channels. Blunted affect is the most likely negative symptom to persist in youth with first episode psychosis (Galderisi et al., 2013) and individuals with higher blunted affect are more likely to have other persistent negative symptoms and worse functioning (Hovington et al., 2012; Karakuş et al., 2022). However, there are almost no interventions that effectively address blunted affect (Galderisi et al., 2018). The lack of attention to blunted affect has delayed alleviation of suffering and dysfunction for these individuals. This commentary addresses operationalization of blunted affect, identifies barriers to the development of interventions for blunted affect, and proposes solutions in the hopes of advancing treatment.

1.1. Measurement and operationalization

Blunted affect is typically measured using ratings scales and operationalized as a clinician-perceived reduction in expressivity (Kirkpatrick et al., 2011; Kring et al., 2013; Ventura et al., 1993). This expressivity is defined in frequency, intensity, duration, and range of facial expressions, head movements and/or gestures, and sometimes (though not always) including modulation of vocal pitch and expressivity, while excluding the quantity of speech produced which is typically rated as alogia or paucity of speech (e.g. Kirkpatrick et al., 2011; Kring et al., 2013; Ventura et al., 1993). While blunted affect generally includes nonverbal communication through various channels, much research has focused on blunted affect specific to facial expressivity (i.e., blunted facial affect) though there is reason to suspect that even when clinicians are specifically rating blunted facial affect they include other gestural channels (Cowan et al., 2023). Facial expressivity has also been explored using electromyography (see Mattes et al., 1995; Sestito et al., 2013; Varcin et al., 2019 for a nonexhaustive series of examples) and either computerized or observer coded facial analyses systems (e.g., Cowan et al., 2022a; Gaebel and Wölwer, 2004; Gupta et al., 2020; Kohler et al., 2008a, 2008b; Trémeau et al., 2005). These operationalizations explore precise changes in muscle movements of the face and head. The two different operationalizations raise a necessary question about the difference between blunted affect as a gestalt construct, as perceived by conversational partners as a multichannel reduction in expressivity, versus decreases in isolated muscle movements which hold specific weight for communication with partners. It is common for all of these channels and operationalizations of blunted affect to be collapsed together, which reduces the clarity of understanding of this concept.

There are few intervention studies which have specifically included blunted affect as an outcome measure. A study of transcranial magnetic stimulation found that blunted affect improved slightly for individuals with depression, though not for those with schizophrenia (Bodén et al., 2021). Of the psychosocial interventions, body oriented psychological therapy was found to make a significant improvement in blunted affect relative to a supportive therapy control in a small randomized control trial (Röhricht and Priebe, 2006). Similarly, an effect was found for motivational and behavioral activation relative to a control condition for diminished expressivity (Choi et al., 2016). An intervention designed to blend cognitive behavioral and social skills therapies found a small *decrease* (i.e. worsening) in expressivity over time (Granholm et al., 2014). Similarly, we conducted a secondary analysis of the effects of a multicomponent behavioral intervention (Bennett et al., 2023) on blunted affect and diminished expressivity symptoms generally (see supplement for additional details) and found that diminished expressivity symptoms as measured by the CAINS (Kring et al., 2013) significantly worsened from baseline to follow-up. This secondary analysis

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pointed us towards common barriers in blunted affect intervention development.

1.2. Barriers to blunted affect intervention development

Three factors impede advancement in understanding and treating blunted affect: collapsing across all negative symptoms, unknown mechanisms, and ineffective intervention timescales. First, collapsing across negative symptoms has impeded negative symptom treatment research generally (Giordano et al., 2022). There are at least two distinct negative symptom domains – experiential symptoms that involve decreases in experiences of pleasure, social motivation, and general motivation; and expressive symptoms that involve decreases in expression through facial/gestural and verbal channels (Kring et al., 2013). Some research finds that each negative symptom is in fact a distinct domain (Ahmed et al., 2022). Unfortunately, most treatment research either focuses on social motivational negative symptoms or collapses across negative symptom domains (Giordano et al., 2022), resulting in a lack of knowledge of how to intervene for expressive negative symptoms. By collapsing negative symptoms into a single rating, we lose the ability to identify whether a novel intervention has different impacts, in terms of magnitude or direction, on different symptom domains.

Second, collapsing across negative symptoms presumes that the same mechanisms and treatment targets are relevant to these different symptom domains. In fact, mechanisms for blunted affect are largely unknown, and likely multifactorial and interacting. Further, the operationalization of negative symptoms as a single domain has made it difficult for researchers to identify mechanisms. Blunted affect has historically been almost exclusively operationalized as a clinician rating of decreased expressivity relative to "normal" or "expected" (e.g. Kirkpatrick et al., 2011; Kring et al., 2013; Ventura et al., 1993). Inherent in that operationalization is that blunted affect is a *perception* and an *expectation* – one shaped by the clinician's culturally-bound expectations for expressivity. Culture strongly affects what displays of emotional expression are considered normal and appropriate (Matsumoto et al., 2008). These findings in nonclinical samples align with recent work which finds that clinician ratings of blunted affect are primarily driven by increases in negative expressions *and* decreases in socially engaging expressions (see Cowan et al., 2022a for a review and corroboration of this literature). While rating scales define blunted affect as a decrease in expressivity overall, this operationalization does not wholly overlap with what clinicians are actually rating: a decrease in affiliative information conveyed through facial and gestural channels (Cowan et al., 2023, 2022a, 2022b). Further, clinical ratings are taken from an extremely contextually limited source – typically a single interaction with a relatively unfamiliar rater, in a hierarchical environment, presumed to generalize to the community (see Cowan et al., 2022b for a counterexample). If we expand the operationalization of blunted affect to be "a decrease in the expression through facial and gestural (and potentially vocal) channels of culturally expected affiliation cues," several possible mechanisms, including neuromuscular, cognitive, motivational, and social cognitive pathways become apparent, and ripe for testing. These mechanisms may also be additive, interactive, or cascading, which would have implications for the selection of intervention targets and their order of implementation or may be impacted by other variables like psychotropic medications, comorbid diagnoses, and other symptoms.

Finally, given that the mechanisms and systems underlying blunted affect remain unknown, it is difficult, if not impossible, to properly select the length of treatment or follow-up. Without knowing what an intervention should target, or how long it should take that target to change, one cannot know how long to intervene. Especially if blunted affect is revealed to be a multifactorial or dynamic system, research follow-ups may be too short to identify changes which result from a mechanistic cascade which takes time to become evident. For a simplified example, if blunted affect is primarily the result of overtaxed social cognitive resources, an intervention which targets making expressivity more automatic may take years of practice to generalize to a variety of contexts. A three-month intervention and a six-month follow-up in a relatively hierarchical environment like a research laboratory may not be attuned to these changes.

1.3. Recommendations

A better understanding of blunted affect is necessary for treatment development. As reviewed above, the operationalization of blunted affect requires both precision and agreement across somewhat disparate literatures. With that operationalization will come necessary updates to how blunted affect is measured; ideally, this measurement will be multimodal, incorporating both clinician perception and objective metrics of movement. This specification will allow increased research into the ways that blunted affect may be experienced and perceived differently in different contexts, cultures, or considering other experiences and symptoms. Ideally, this will also lead to research on mechanisms of change. Once mechanisms of blunted affect have been identified, targeted interventions carefully chosen to intervene on hypothesized mechanisms of change can be conducted. Identifying mechanisms of change will allow for hypothesized time-courses of intervention and follow-up necessary, leading to optimal study design.

Blunted affect is poorly understood. Now, few interventions show promise for improving these symptoms, and for most interventions, it is unknown whether they have an effect at all, or even a detrimental effect. Designing interventions for these symptoms may require additional modification to ensure that they are targeted, effective, and helpful, but in the service of improving individuals' social communication and functioning, it is a necessary investment.

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Declaration of competing interest

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