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**Title:** The centrality of sense of self in psychological flexibility processes: What the neurobiological and psychological correlates of psychedelics suggest

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**Synopsis:**

 Psychedelics (hallucinogens or drugs that alter a person’s awareness of their surrounding as well as their own thoughts and feelings) have been a part of cultural and therapeutic practices for a long time. However, certain cultural pressures have impeded good research in their therapeutic advantages. There has been renewed interest in psychedelics’ role in psychological processes. By and large, the scientific community recognizes that psychedelics cannot be a stand-alone treatment and any benefits to be gained from their use will have to be coupled with evidence-based therapies. Research needs to focus on an empirical verbal/cognitive model and how it affects the psychedelic experience. Acceptance and Commitment Therapy (ACT) seems to be a prominent framework for structuring the use of psychedelics. This paper will explore the implications of this and how it relates to psychological flexibility processes. Since psychedelic experiences involve verbal/cognitive processes, there is utility in examining it in terms of the basic verbal unit of analysis of ACT and Contextual Behavior Science (CBS), relational framing. There are two benefits to this approach. First, it ties psychedelic experiences to a scientific and naturalistic process at the psychological level thereby demystifying it. Second, constructing a basic relational framing account of psychedelics (that also coheres with neurological data) could help providers and researchers use the ACT model more effectively. Since much of the research in psychedelics agree that psychedelic experiences involve changes in the sense of self and perspective-taking, this article explores sense of self from a Relational Frame Theory (RFT) approach and argues that it is a naturalistic way to understand psychological events in psychedelic experiences.

 The dawn of RFT research expanded the analysis of verbal behavior/cognitive events, allowing for an analysis of more comprehensive subjects including sense of self. RFT has established relational framing as a behavioral operant. Relational operants are central features of verbal/cognitive events and provide a way of conceptualizing the sense of self in a naturalistic way. The verbal sense of self emerges over time and can be taught with various methods. Perspective taking and theory of mind skills (TOM) are central features of sense of self. From an RFT standpoint, perspective-taking, and theory of mind skills are relational framing skills. Perspective-taking skills in RFT emerge from deictic frames. Deictic frames establish the perspective of the speaker. The most common deictic frames are I-you, here-there, now-then. These can be trained starting with simple non-arbitrary conditional discriminations and progress to increasingly more complex and arbitrary discriminations. These have been correlated with perspective taking and TOM skills. From basic research on deictic frames a conceptualization of sense of self has emerged in ACT and RFT.

 There are three main categories of sense of self according to early ACT and RFT literature that serve as a naturalistic foundation. The perspective-taking self is the verbal I/here/now. Essentially, it is the vantage point of observation (aka, deictic ‘I’) of a person. From this point of view, it seems that anything “I see/do” are a part of “me.” Other words used for this self are the “observing self” or the “transcendent self.” The experiential self (self-as-process) is an ongoing process of verbal self-awareness. This is when the person is interacting with a combination of private events and external events and notices things such as “I feel sleepy.” Another word for it is “knowing self.” The conceptualized self (self-as-content) is our self-story, which includes preferences or qualities that we use to define ourselves (i.e., being smart, kind, mean, etc.) All three co-evolved and are interrelated, but the perspective-taking self is central to understanding psychological flexibility processes. Perspective-taking relational frames can combine with other relational frames which allow people to take the perspective of others in more comprehensive ways.

 Research has shown that the RFT measures of sense of self correlate with psychological health. Of particular interest to psychedelic research are the findings that have emerged that suggest that it is better to frame perspective-taking in a hierarchical fashion rather than in a coordinative fashion. That is, it is more useful to take the perspective of self as containing (hierarchical) all your experience than being separate or apart from them (distinction) which seems to be an important difference for exploring the features of self-experience under the effects of psychedelics.

 There are some psychological correlations with psychedelic experiences that can serve as a naturalistic unit of analysis, mainly related to complex verbal behavior. Psychedelic experiences seem to be highly influenced by complex verbal repertoires. However, there are many limitations of the research on psychedelics as well as in relational framing that have made it difficult to measure the psychological effects of psychedelics. Despite these limitations, some broad categories of effects have been reasonably captured by measurement tools such as direct observations, verbal reports, and questionnaires, but historically these have been described in non-naturalistic terms (i.e., the ego, transcendence, alternate dimensions of reality, soul). To move the analysis forward, it is important to have a scientific account of the psychological sense of self, which then can be used to explore how the psychological account of psychedelic experiences align with the neurological effects.

 One of the biggest effects of psychedelic experiences tends to be movement from a judgmental sense of self to a perspective-taking sense of self. The effect is known by several names such as “ego dissolution,” “positively experienced depersonalization,” “decentering,” and “oceanic boundlessness.” These effects can be felt as an increased sense of unity and reduced self-importance for example. Others report that they experienced a blurring of boundaries between themselves and everything else in the environment and have a profound connection to everything (oceanic boundlessness). This sense of oceanic boundlessness has also been reported in mindfulness practices. Studies have shown that these types of experiences do correlate with good treatment outcomes and there is also some neurobiological data that suggest good outcomes as well. It is, however, important to do more empirical and controlled research using precise measurements to better understand the utility of these effects.

 Psychedelics also seem to change stimulus control and motivational functions. For example, people may report that they “saw” sounds or had vivid visual experiences in the dark or with their eyes closed. From an RFT perspective, this seems to be explained by changes in motivational variables, rule-governed behavior, or stimulus functions related to present-moment awareness, but there is not enough research to parse out the important distinctions that apply in these situations. There are, however, some important known neurobiological effects. For example, broadly speaking, psychedelics seem to reduce the activity in the areas of the brain that are related to our conceptualize self (the self that tends to be evaluative) and increase the activity related to the perspective-taking self. Note that mindfulness practices can have similar effects, although to a lesser extent. As a sidenote, psychedelics have also been shown to increase neuroplasticity.

 Another potential effect of psychedelic use is feeling a sense of insightfulness. Some people report feeling like they had a profound experience and gained important knowledge while under the influence of psychedelics. Interestingly, these rules derived from the psychedelic experience can persist long after and can even lead to changes in values. This is not typical with the use of other substances where someone may say something that sounds profound in the moment under the influence (for example of alcohol) but sounds silly or irrelevant once they are sober. For this reason, this seems to be an important outcome of psychedelic experiences and warrants a more naturalistic psychological account to fully understand it.

 Psychedelic experiences can also cause intense undesirably experiences such as feelings of fear or losing control and though they can be heavily influenced by environmental supports, psychedelics can lead to experiencing anxiety. These experiences can often be resolved through acceptance work in a controlled environment. Psychedelics could provide research opportunities related to exploring negative events and working on acceptance processes. Psychedelic experiences can serve as a platform for transforming experiential avoidance into experiential acceptance.

 More than 30 years ago, Hayes (1984) linked spiritual transcendence to learned perspective-taking verbal skills. Developing a perspective-taking sense of self requires the person to “see themselves seeing” or develop a sense of observing their experience without necessarily being a part of it. This is odd and difficult behavior, though reaching the point where your sense of self is that of an observer makes it easier to “see” rules without necessarily following them. Said another way, the perspective-taking self helps increase psychological flexibility processes such as defusion and acceptance and increases your sensitivity to direct contingencies as well. These psychological flexibility processes parallel many of the neurobiological and psychological effects of psychedelics. At the neurobiological level, psychedelics tend to decrease the tendency to self-evaluate or create self-narratives (which can make you insensitive to your current environment) and enhance the perspective-taking self. This is evidenced by the fact that people who experience neurobiological changes related to the sense of self AND also report a reduction in the conceptualized sense of self have better clinical outcomes. Psychedelic research supports the psychological flexibility model and its emphasis on expanding the perspective-taking self or the hierarchical deictic “I.”

 The perspective-taking self is central to psychological flexibility. This centrality has never been reflected in the psychological flexibility hexagon used to demonstrate how the processes of flexibility are related. A new rendition of a model that takes the centrality of the perspective-taking self into account has emerged where the perspective-taking self has been hierarchically framed (see the article for full description). Essentially, this model reflects the arguments provided herein that awareness is the foundation of psychological flexibility from which the other processes emerge.

 There is still a lot of research to be done on the concepts proposed here. That said, preliminary findings suggest that psychedelic research can contribute to the development and refinement of psychological flexibility processes and the sense of self. Conversely, Contextual Behavior Science (CBS) research can help establish appropriate therapeutic psychedelic use. There is potential for mutually beneficial partnerships for these two domains of research.

**Relevance to our mission and vision:** It is part of our mission to develop effective learning systems that benefit those we serve. We also aim to serve people with a varied set of skills, some of them with complex verbal repertoires. Moreover, many of the people who will receive our services will be faced not only with a learning or developmental disability but also with some form of psychological suffering. Understanding the development of language, first and foremost, and the impact it can have psychologically (both good and bad) is imperative to our mission. Understanding ACT and the psychological flexibility model can lead us to assessment and intervention systems that can alleviate psychological suffering for people-served, their support teams, and our staff.

**Relevant iASK assessment domains:** Complex Verbal Behavior, Committed Action