Whither Inflexibility in Depression?
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Stange, Alloy, and Fresco (2017) perform a systematic review of the relationship between depression and inflexibility. We welcome the authors’ review as a sign of ferment in the field. It is cheering to see inflexibility recognized as meriting precious journal space as a target article. The authors’ substantive conclusions also provide validation of this topic. Although effects are not always consistent, reliable associations are often found between depression and inflexibility across several different metrics of inflexibility. Now that inflexibility has arrived as an important area in depression research, we must consider the key next steps. In this commentary, we consider four growth points to enable investigators to bring this field to greater maturity to reach more robust conclusions about the role that inflexibility may play in depression.

WE NEED TO RECONSIDER WHAT INFLEXIBILITY IS AND HOW IT IS MEASURED

How should (in)flexibility be defined? Stange and colleagues define flexibility “as the ability to adapt in response to changes in external or internal circumstances” (2017). It is instructive to compare this definition to that of the Oxford English Dictionary (2016), which defines inflexibility as “the quality or condition of being inflexible; incapability of being bent; unyielding stiffness, rigidity; firmness of purpose, obstinacy.” We highlight this contrast not because one definition is “correct” but to illustrate the power of definitions to shape our view of what is salient. In the first definition, inflexibility carries negative connotations of a failure to adapt to shifting circumstances; in the second, it carries positive connotations of remaining steadfast amidst flux.

At this early stage of research, it would be premature to close off different ways of defining inflexibility. So, not only might inflexibility be a manifestation of low self-regulation ability, but it also can, more simply, be any stereotyped response pattern that occurs across situations. This descriptive use of inflexibility leaves open the question of why a person exhibits the same response profile across different contexts. Consider explanatory flexibility, one variable in Stange and colleagues’ (2017) review that appears altered in depression. It could indeed be that explanatory inflexibility reflects a person’s broad inability to make a wider range of attributions. Or, it could be that a person has intact ability but less motivation to attempt to make variable attributions. Or, it could be that a person has intact ability but experiences changes in how attributions are habitually made (e.g., because of negative cognitive biases). Thus, a descriptive approach to inflexibility considers a number of different explanations for inflexibility patterns as viable.

Whether one uses a narrow or a broad definition of inflexibility, a dizzying array of psychobiological proxies is potentially relevant (Kashdan & Rottenberg, 2010). Let us consider what Stange et al. say about inflexibility as ability: “Organisms with greater capacity for flexibility are able to identify contextual demands, choose responses from a repertoire of options, appropriately and efficiently match responses to the demands of the situation, and adjust responses as needed given ongoing changes in the environment or additional information obtained that is relevant to the goal at hand” (2017). This statement covers the full sweep of self-regulation, with a raft of processes implicated in the perception and monitoring of the environment, further processes in the perception and monitoring of the self, through the perception and monitoring of self-related actions, and, finally, processes relevant to perceiving and correcting
actions in response to environmental feedback. In other words, even with a circumscribed definition of inflexibility, the number of potential proxies is very, very large.

Indeed, part of the attractiveness of inflexibility is a versatility that offers something for everyone. Researchers who use disparate methodology in the domains of cognition, emotion, behavior, social functioning, and physiology can find targets. And within each of these domains, there are more local targets. If researchers want to claim that their favored metric is an index of inflexibility, there is little to bar them. From this perspective, many of the variables that have been historically considered in depression research, whether blunted cortisol responses to stress, memory biases for negative stimuli, or rumination, can easily be conceptualized (or reconceptualized) as measures of inflexibility.

Interestingly, despite this wealth, in their review, Stange et al. focus tightly upon five components of inflexibility: set-shifting, affective set-shifting, cardiac vagal control, explanatory flexibility, and coping flexibility. Although we heartily agree that these variables are viable proxies of inflexibility, the reasons for elevating these five above other proxies appeared to be largely pragmatic, such as the number of studies available for review and the presence of other reviews. In the absence of a true consensus, we welcome further arguments and discussions about the “best” proxies of inflexibility.

Given the vast number of inflexibility processes or outcomes, and the limited information concerning how this domain is organized, what is to be done? Is there a danger that research on inflexibility in depression might become scattered, shapeless, and diffuse? In a word, yes. To navigate in such an environment, clarity is and will be at a premium. A minimal request to fend off chaos would be to ask all who write in this area to provide an explicit rationale (a theoretical and/or empirical basis) for choosing a particular proxy of inflexibility. In cases where there is not a strong basis for selection, we enjoin authors to be appropriately modest in their claims.

**WE NEED BETTER THEORETICAL MODELS OF INFLEXIBILITY TO GENERATE AND TEST HYPOTHESES**

Ultimately, to avoid the fate of research becoming scattered, shapeless, and diffuse, there is no escape from theories. Theories help us collect meaningful data. Specifically, theories guide us in prioritizing which variables to select from the large menu of choices. Theoretical models (both new ones and revisions of existing theories) are indispensable for generating hypotheses about how flexibility might be organized and how different inflexibility components might be related to one another. For example, are more complex cognitive patterns of inflexibility, such as attributional patterns, built from inflexibility in more basic cognitive elements, such as attention or working memory? A related question is to what extent different domains of inflexibility, such as cognition, behavior, or physiology, demonstrate independence from one another. If inflexibility proves not to be a unitary construct, we cannot assume that a person who exhibits inflexibility in one domain will also exhibit inflexibility in another. Instead, each person would possess a unique inflexibility profile requiring a multidomain measurement.

In the end, we will need to employ different research designs, including experimental designs, factor-analytic designs, and longitudinal studies, to provide converging evidence and to bolster the construct validity of inflexibility. This work will help us clarify which proxies are redundant, which provide unique predictive power, and how different proxies might interact with one another.

As we develop better models of how inflexibility is organized, we should feed this information forward into stronger theoretical accounts of how and why inflexibility might be related to important outcomes, such as depression. For example, our own work on emotion context insensitivity views inflexibility as a core attribute of depression. Inflexibility is assimilated into an evolutionary model of the functions of low mood, where strong low moods facilitate a defensive posture of environmental disengagement, particularly in unfavorable circumstances in which acting may prove costly (Rottenberg & Cowden Hindash, 2015). One corollary of this view is that depressed people will exhibit less dynamic emotional responses to novel environmental stimuli. As we have adduced evidence that emotion context insensitivity is a reliable correlate of depression, we have begun to explore mechanisms that might be involved (e.g., cardiac vagal control).

As noted in the review by Stange and colleagues (2017), researchers have begun to establish inflexibility...
to be a robust correlate of depression; a key next step is to address the issue of causation. Does inflexibility lead to and/or maintain the symptoms of depression, and if so, what is the explanation? We consider it unlikely that a single pathway will be sufficient to explain how inflexibility leads to depressive symptoms or helps to maintain those symptoms. Rather, there are likely several manifestations of inflexibility that can enhance depression. Further, any single manifestation of inflexibility may have a multitude of downstream effects. For instance, an inflexible cognitive style such as rumination might feed depression because it keeps the cognitive spotlight on depressogenic material across environments and because it deters a person from actively engaging in activities or information that can otherwise help to repair mood.

**WE NEED TO USE DYNAMIC MODELS OF INFLEXIBILITY**

Is inflexibility a trait that is independent of mood, or a state that waxes and wanes with episodes of depression? Stange and colleagues (2017) review data that are, at this time, more compelling for the state view than the trait view, as there is far more evidence that inflexibility is present during episodes of depression than evidence that inflexibility precedes or follows episodes of depression.

To fully resolve this question, the field will need to use more dynamic models. This is true in two ways. First, and perhaps most obviously, further longitudinal within-subject designs are needed that test depressed or depression-vulnerable people inside and outside of the depressed state.

Second, inflexibility is a dynamic construct; it refers to a pattern over time (Kashdan & Rottenberg, 2010). Therefore, it is doubtful that a single-point assessment, such as a retrospective self-report, can truly capture it. Ecological momentary assessments have particular advantages in this regard because they allow researchers to perform multiple measurements of behavior/affect/cognition, and so forth, which can afford inferences regarding a person’s inflexibility or variability across situations. Further, the use of such designs would make it possible to examine how inflexibility relates to effective coping with environmental challenges, and whether it predicts downstream depressive symptoms. Ultimately, a methodology that allows researchers to capture people in multiple real-world contexts over time is essential to capture a dynamic construct such as flexibility.

Finally, we agree with the authors that it is critical to test the idea that inflexibility may render people vulnerable to depression only in specific contexts. Again, by taking multiple measurements using within-subject designs, it should be possible to determine whether (a) flexibility itself varies across time or situation and, equally important, whether (b) the negative consequences of inflexibility are conditional on a specific kind of situation, such as when a person is facing environmental adversity (e.g., stress). Indeed, considering context and the dynamic roles of inflexibility across time and situation highlights the question of when inflexibility matters, a salient issue for optimizing intervention. Clearly, it would be productive for future work to consider the added value of tailoring intervention strategies to enhance flexibility in specific situations.

**BASIC RESEARCH IS NEEDED TO BRING RESEARCH ON INFLEXIBILITY TO CLINICAL FRUITION**

Although there are several empirically supported treatments for depression, success rates are far from perfect and patients are often left with residual symptoms. Targeting inflexibility has great (but as yet unrealized) potential to enhance treatments for depression. There are several steps that are needed to begin to realize this potential.

A first order of business remains to improve our basic research understanding. Obviously, a serious intervention focused upon altering flexibility to treat depression is not meaningful unless we have clear ideas about what inflexibility is, how to measure it, or why aspects of inflexibility relate to an outcome like depression. Second, treatment development will be far more focused if it is informed by further background work, specifically experiments that clarify which aspects of inflexibility are the most plastic, which techniques are the most successful in changing inflexibility, and which changes in flexibility are most important for changing depression symptoms.

Of course, it is not necessary to entirely reinvent the wheel. As it stands, several empirically based interventions already consider cultivation of flexibility as a
therapeutic aim. For example, acceptance and commitment therapy specifically targets flexible engagement of internal states, and aims to discourage rigid avoidance and promote acceptance of those states (Hayes, Follette, & Linehan, 2004). Although other supported psychological interventions for depression, such as cognitive behavioral therapy, may not explicitly focus on flexibility as a treatment aim, these treatments will nevertheless almost inevitably impact flexibility (due to its centrality in psychological functioning). Thus, a third strand of treatment-related research will focus on how existing treatments impact flexibility. By doing so, we can determine which aspects of flexibility are altered by existing treatments, while shedding light on those recalcitrant aspects that may require different therapeutic approaches.

Finally, we will need clinical trials to test inflexibility-related interventions that aim to reduce the burden of depression on society. These trials may examine novel interventions that attempt to explicitly enhance flexibility and/or examine modifications of existing treatments to better target flexibility. Our hope is that this treatment-related research, in addition to yielding critical clinical benefits, returns us full circle to fundamental questions about inflexibility, providing further clues about what it is, why it matters, and how it influences psychological states, such as depression.

REFERENCES

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