The Role of Motivation for Treatment Success

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Learning during skills-based psychosocial treatments for schizophrenia is influenced by the motivating properties of the treatment context and the motivational orientation of the client. Given that motivational impairment is a core feature of schizophrenia with significant functional implications, intervention strategies emphasizing extrinsic and/or intrinsic goals may be prescribed to enhance skill learning and treatment outcomes. The purpose of this article is to consider the role that motivation plays in treatment success by evaluating the relationship between motivation and learning during cognitive remediation for schizophrenia. As intrinsic motivation (IM) is most often associated with learning, we will integrate research findings which address 3 main questions: (1) is IM in schizophrenia static or dynamic, (2) is it possible to manipulate the state of being intrinsically motivated and if so do manipulations of IM affect learning? and (3) can motivation theory be translated into clinical practice? This knowledge can facilitate treatment strategies to address the low base rate of IM that is characteristic of schizophrenia and can be applied to cognitive remediation as well as other psychosocial interventions which require learning for treatment success.

Key words: motivation/schizophrenia/cognition/cognitive remediation

Introduction

Impairment in motivation is a core deficit of schizophrenia, which is known to impact psychosocial outcome[1,2] and ability to engage in and benefit from treatment.[3,4] Study of the construct of motivation as it applies to schizophrenia is a burgeoning area of research, spurred by interest in delineating the phenomenology of the illness and efforts to develop more effective treatment strategies. The role of motivation for treatment success has been most studied in relationship to behavioral treatments such as cognitive remediation, substance abuse, and compliance therapy, but there is increasing interest in how it impacts a range of psychosocial interventions.[5–8]

Traditionally, the success of psychosocial interventions has been linked to the awareness of the client that they require the intervention and their ability to learn the skills being taught. Recovery-based programs teach skills pertinent to social, vocational, neurocognitive, and social cognitive functioning, independent living, anger management, symptom management, as well as a host of other specific functional skills. Cognitive capacity is one factor that impacts ability to learn, and the neuropsychological deficits so prevalent in schizophrenia have been identified as a rate-limiting factor for treatment outcome in schizophrenia.[9–11] The abilities to pay attention, remember, and process the information to be learned are considered critical to treatment outcome.[12] However, learning is not only dependent on cognitive capacity but is also influenced by instructional techniques and motivation of the client to engage in the activity and learn the skills.[13–15] Arguably, motivation is key to the success of psychosocial treatment interventions precisely because it is so essential for learning to take place.

The study of motivation typically assumes that the ability to initiate and sustain behavior is ultimately tied to reward processing, and it is the potential for gratification or goal attainment that motivates people to engage in a behavior. Rewards can be external to the individual, such as money, a prize or verbal praise, or rewards can come from the pleasure one gets from the task itself or from the sense of satisfaction in completing or engaging in a task. When rewards are external to the individual, one is said to be extrinsically motivated and when the rewards are within the individual and inherent to task performance, behavior is intrinsically motivated.[5] Environmental contexts pull for different motivations. For example, in vocational settings, extrinsic motivation may play a larger role, while in clinical treatment settings,

intrinsic motivation (IM) may be more predominant. While there may be a predominance of one reward orientation over another in any given setting, it is common for both extrinsic motivation (EM) and IM to be operative. People may work both for a remunerative extrinsic reward and the intrinsic reward that comes when the work interesting; they may go to a treatment clinic because it makes them feel better (IM) and feeling better allows them to work and maintain their apartment (EM). Although the balance between EM and IM can shift over time for any person, the degree of synchrony with the environmental context (ie, the opportunities for rewards) is a key determinant of motivational drive. If the opportunities for rewards in a given context are congruent with one's motivations, goal-oriented behavior is likely to occur. On the other hand, if the balance of motivations fits poorly with the nature of the activity, unmotivated behaviors may occur. For example, a person who is largely extrinsically motivated to engage in activities that are associated with intangible outcomes (eg, learning, socializing), may become unmotivated when tangible rewards are not forthcoming.

When considering the role of motivation for treatment success, it is valuable to appreciate the larger context in which psychosocial interventions take place. Cognitive remediation is a psychosocial intervention that like other skills-based treatments for schizophrenia occurs in the context of a learning environment. In both healthy controls and people with schizophrenia, IM is specifically and positively associated with more learning, greater persistence of learning, and greater engagement in learning activities.[4,15–18] The mechanism by which IM enhances learning is thought to relate to the spontaneous gratifications of needs for competency and autonomy, which occur when people engage in an activity with a full sense of willingness and volition.[17] Furthermore, IM is the impetus for an activity due to associations with enjoyment of and positive feelings for that activity, which are usually inspired by personally relevant goals and values.[5] Thus both healthy students and patients with psychosis are intrinsically motivated for difficult learning tasks, when they engage in targeted behaviors because of the interest, enjoyment, and the satisfaction derived from their engagement in the activity rather than exclusively due to external rewards. Consequently, intrinsically motivated behaviors are repeated without extensive external rewards or constraints, and therefore, more likely to be maintained. That is not to say that EM has no role in learning activities—but rather that on balance, when IM is greater, learning outcomes are better. Knowing the essential role of IM in learning and treatment outcomes and appreciating that IM is low in people with schizophrenia,[13] it becomes important to understand if, in schizophrenia, IM is static or dynamic, if it is possible to manipulate the state of being intrinsically motivated,

and if manipulations of IM affect learning. This knowledge can facilitate treatment strategies to address the low base rate of IM that is characteristic of schizophrenia and in so doing may augment psychosocial treatment outcomes.

Is Intrinsic Motivation Static or Dynamic?

Recent research in schizophrenia populations suggests that IM is a dynamic process that changes over time. In a recent prospective study, Nakagami and colleagues[1] examined IM among 130 individuals with schizophrenia or schizoaffective disorder attending community-based psychosocial rehabilitation programs. A measure of IM was ascertained via clinician-rated items from the Quality of Life Scale. Data yielded a significant rate of change in this measure of IM over 6 and 12 months following an initial assessment, indicating that IM in schizophrenia naturally varies over time. Importantly, positive changes in IM were strongly associated with positive changes in psychosocial functioning, thereby underscoring the significance of motivation in the context of psychosocial treatment. In a separate study of 57 outpatients with schizophrenia, Choi and Medalia[4] used the Intrinsic Motivation Inventory for Schizophrenia Research (IMI-SR), a new adapted self-report measure, and reported on changes in IM in relation to a 4-week cognitive training intervention. Results supported the dynamic nature of IM in schizophrenia, although the change in IM was significant only in a subgroup that received a motivationally enhanced version of the training task. These results add to those reported by Nakagami et al[1] in demonstrating that changes in IM can be detected relative to participation in a learning program and that changes are sensitive to the motivational properties of the context in which the learning tasks are embedded. Taken together, these two studies provide strong preliminary support for the malleability of IM in schizophrenia and give a basis for future studies to replicate and extend the findings by varying the treatment context and sample characteristics, and investigating the convergent validity of methods of assessing IM.

Is It Possible to Manipulate the State of Being Intrinsically Motivated and Impact Learning Outcomes?

Theoretical Perspectives on IM

The results from Choi and Medalia[4] demonstrate not only that IM in schizophrenia is a dynamic process but also that it is malleable, sensitive to environmental manipulation. Theoretical perspectives outlining the contextual determinants of motivation to learn have provided a basis for empirical study and the development of instructional techniques that increase motivated behavior and learning outcomes. Expectancy-value theory

(EVT[19]) is one widely accepted model of motivation that posits that expectations of success (competency) on a learning task and the perceived value of the task are central determinants of motivation to learn. Self-competency beliefs are influenced by one's assessment of past performance and appraisal of current task properties such as task difficulty, concreteness of task goals, and the temporal proximity of goal attainment. Self-competency beliefs underlie expectations for future success and thus affect the initiation of learning behavior. Additionally, initiation and maintenance of learning behavior are impacted by value appraisals, with respect to the interest and enjoyment of the learning task as well as the utility, cost, and attainment value of expected outcomes. Self-determination theory (SDT[20–22]) is a second widely accepted model of motivation which, like EVT, asserts the importance of perceived competency in determining behavior during learning tasks. Additionally, SDT posits that experiences of personal control and autonomy-supportive relationships during learning are central to appraisals of task value, which in turn, impact IM and drive motivated behavior.

The motivation theories that were developed to explain learning behavior in nonpsychotic individuals also provide an overarching framework to understand motivation in schizophrenia.[5] In both nonpsychiatric and schizophrenia populations, competency expectations have been found to determine choice to participate in a learning activity, perseverance on effortful learning tasks, and the degree of learning retention from the activity.[23–26] There is evidence that perception of competency in schizophrenia is sensitive to the experience of reduced agency.[26] Furthermore, in schizophrenia, perceptions of competency have been linked to perceptions of task value, lending support to the applicability of EVT for understanding motivation in schizophrenia.[26] When a learning exercise is seen as having value in helping one to achieve personally relevant goals and the learner experiences control and a sense of agency in the learning situation, IM to learn and learning outcomes may be enhanced.[14,19–26]

There is evidence to suggest that, in general, people with schizophrenia are driven to achieve positive outcomes by the same factors as nonpsychiatric controls. For example, Barch et al[27] demonstrated that nonpsychiatric controls and people with schizophrenia self-report similar motivational traits on dimensions of personal mastery and competitive excellence. In addition, relationships between motivational traits, mood, and personality measures were similar between groups, suggesting similar processes underlying motivation. In the study validating the IMI-SR,[13] factor and validity analyses of the IMI-SR identified task interest, perceived choice, and task value as being integral to the construct of IM in a sample of outpatients with schizophrenia. In the schizophrenia sample, responses on the IMI-SR correlated significantly with additional measures of perceived competency and autonomous regulation, both constructs highly germane to IM in nonpsychiatric controls. Empirical data thus provide evidence that the constructs theorized within SDT and EVT to underlie IM in nonpsychiatric populations are applicable to the study of motivation in people with schizophrenia.

Using Intrinsic Goals to Promote IM and Learning in Schizophrenia

Given that constructs underlying IM to engage in learning tasks are comparable between learners in the general population and those with schizophrenia, techniques to enhance IM may be similarly applied within learning-based interventions. Educational psychology has studied the application of EVT and SDT to instructional techniques, in order to enhance learning. Research has emphasized specific elements of the learning context that promote IM and consequently learning. Learning activities are more likely to promote IM and learning when they (1) provide opportunities to personalize tasks (personalization), (2) make the value more obvious by placing tasks within a context that links the learning task to everyday life (contextualization), and (3) promote autonomy by providing opportunities to control aspects of the learning activity.[4,28] Research has also emphasized qualities of the overall learning environment that promote IM. For example, an autonomy-supportive learning environment is associated with more IM and learning than a controlling environment.[18] Autonomy may be supported through the language of instruction as well as by acknowledging the learning style and learning goals of each individual.

There is evidence from one study that these same instructional techniques used to enhance motivation to learn in nonpsychiatric populations are also effective in schizophrenia. In a sample of schizophrenia outpatients, Choi and Medalia[4] manipulated the opportunities for personalization, choice, and contextualization in a learning activity and found that both IM and learning increased. Specifically, they examined whether outpatients could attain benefits from an intrinsically motivating instructional approach which (1) presents learning materials in a meaningful game-like context, (2) personalizes elements of the learning materials into themes of high interest value, and (3) offers choices so patients can increase their control over the learning process. Change in motivation and learning was measured in 57 adults with schizophrenia who were randomized to receive ten 30-minute sessions of a math learning game that either had the motivationally enhanced features built into the activity, or was stripped of these features. The motivationally enhancing instructional techniques led to significantly greater IM (66% vs 16% increase on the IMI-SR self-report inventory) perceived competency (90% vs 18% improvement on a self-report inventory),
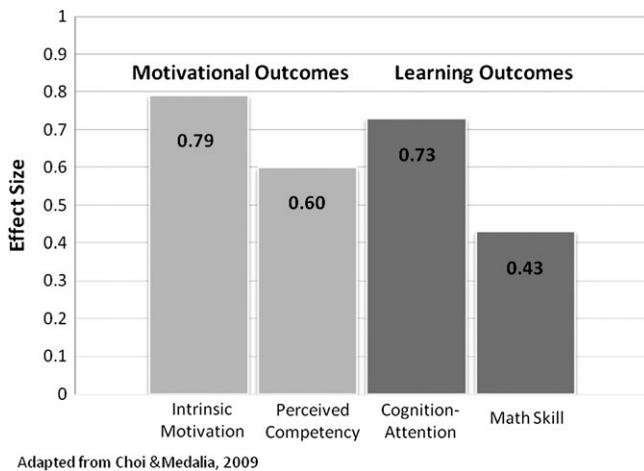
Fig. 1. Effects of instructional techniques that use intrinsic rewards

task-specific learning (67% vs 29% increase), and general cognitive gain (55% vs 29% improvement) with effect sizes in the medium to large range (see figure 1). This data is significant on 2 counts: (1) it further demonstrates congruity between the constructs which delineate the quality of IM in schizophrenia and healthy controls and (2) it demonstrates that the deficit in quantity of IM can be successfully addressed with behavioral interventions that capitalize on intrinsically motivating properties of a learning task. IM was low when patients started the study, but intervention strategies which had no cost to use, which did not rely on extrinsic goals, and which were easy to implement, served to enhance both IM and learning. Future research is needed to both replicate the findings and elaborate on the sensitivity of patients to motivationally enhancing learning cues.

Are Extrinsic Goals Needed to Promote IM?

According to SDT and EVT, EM may predominate when the intrinsic goal properties of a task, such as interest, utility, and attainment value are not salient. Individuals then evidence low IM and low base rates of behaviors associated with IM (ie, sustained learning). One treatment approach would be to make the intrinsic goal properties of tasks more salient, and Choi and Medalia[4] showed that this is effective to increase learning in schizophrenia. Another approach for such individuals would be to use extrinsic rewards to reinforce learning during cognitive interventions. The beneficial role of "soft" extrinsic goals, like certificates and points, is both consistent with general pedagogic practice and, seen through the lens of SDT, may help participants to achieve desired short-term performance goals, thus providing a sense of self-competency which may heighten expectations for future success at mastery goals. For example, a patient may initially have the performance goal of achieving points on a memory activity and, as points accrue, may develop a sense of competency that provides

motivation to work toward the intrinsic goal of better cognition. Thus implementation of nonmonetary reinforcements, such as certificates and points, may, as suggested by Silverstein,[29] complement the intrinsic goal properties of learning activities and may be feasibly implemented to enhance engagement and cognitive outcomes. Proponents of this methodology also cite the significance of the autonomy-supportive context in which procedures to shape learning oriented behaviors are used. By enhancing competency and autonomy, it is thus argued that EM sets the stage for IM; IM to learn may be fostered to enhance cognitive outcomes.

However, the circumstances and extent to which EM is necessary or sufficient to sustain and generalize persistent cognitive gains in people with schizophrenia is at this point unclear. We do not know if there is a differential impact of using "soft" extrinsic goals (eg, points) vs "hard" goals (money). Data suggest that positive behavior change initiated through the use of monetary compensation during learning activities is not sustained after rewards are withdrawn,[30] and the extent to which extrinsic rewards generalize to everyday task performance is limited. Furthermore, research is needed to support the argument by Silverstein[29] that low base rate of IM for learning in schizophrenia is a justification for using extrinsic rewards to reinforce learning during cognitive interventions. To date, there is no evidence that in a treatment setting, base rate of IM in fact moderates change in IM. In the study by Choi and Medalia,[4] baseline IM did not predict responsiveness to instructional techniques, as measured by change in IM and cognition. Even in the context of low interest, when patients were exposed to IM enhancing interventions that did not use extrinsic rewards, there was an increase in perceived competency for task performance, IM, engagement, skill-specific learning, and cognitive improvement. It is however possible that the outpatient sample used in that study did not capture the lowest spectrum of IM base rate. Although there is evidence that the most impaired inpatients do improve when exposed to cognitive remediation that includes manipulations of both EM[29] and IM,[31] the comparative advantages of these manipulations for subsamples of schizophrenia patients is an area that requires further research. Additionally, future studies that delineate the specific components of the learning context, which optimally enhance learning, must also consider whether intervention strategies are feasible to implement and sustain across a range of clinical settings. Monetary rewards are, for example, not necessarily feasible to implement in many clinical contexts.

In sum, learning contexts which support personal autonomy, enhance opportunities for success, and couch learning activities in a context that is enjoyable and personally relevant for the achievement of valued goals are likely to increase IM and enhance learning outcomes for people with schizophrenia. Experimental data

from one study indicates that manipulation of IM alone, without reliance on extrinsic goals and rewards, is enough to enhance immediate and sustained cognitive gains, as well as generalization of learned skills to general cognitive ability. However, both theory and pedagogy support a role for extrinsic goals in learning contexts. Replication studies and research on the potential moderating effect of base rate on change in IM and learning are needed to more fully understand the clinical circumstances when extrinsic and intrinsic goals are best used.

Translation of Theory to Clinical Practice

In order to make meaningful gains in the development of skills-based intervention practices in psychosocial rehabilitation for schizophrenia, it is essential that applications of motivation and learning theories are relevant with respect to the contexts in which they are applied. While the motivational system in schizophrenia is responsive to both intrinsic and extrinsic rewards, the effectiveness and feasibility of specific intervention practices may be dependent on the settings in which they are used. Both cognitive remediation and supported employment programs rely heavily on motivation for successful outcomes. Yet the balance of intrinsic and extrinsic motivation for engaging in these programs differs, thus arguing for prescription of different types of motivational strategies to promote treatment gains. Since cognitive remediation is increasingly being paired with supportive employment and other psychosocial interventions, this is a matter of clinical relevance.

Within the context of cognitive remediation, IM plays a predominant role in enhancing treatment outcomes. Research indicates that the content of learning activities and the motivational context in which learning occurs may be feasibly designed to foster IM in people with schizophrenia. Perceived competency and expectations for success may be fostered by carefully selecting learning activities that are appropriate to the cognitive capacity of the individual, and by titrating the level of difficulty to target more complex abilities. Promoting task interest, utility, and attainment value may be accomplished by personalizing elements of the learning process and contextualizing learning activities so that training tasks are placed within the context of short and long term goals. Provision of choice and learner control during learning activities provides opportunities for self-direction and fosters autonomy. Interventions that involve "soft" extrinsic goals, like feedback and certificates, are generally given with the intent to promote IM so that learning outcomes will be enhanced. Within the cognitive remediation context, instructional techniques ultimately strive to foster IM more than EM.

Work settings often elicit a different balance of IM and EM than cognitive remediation settings. Work therapy and vocational rehabilitation programs provide job placement services and paid work opportunities with concurrent coaching and structured support.[32–36] Perhaps, the most obvious source of motivation to work is monetary gain. Monetary gain is in itself an extrinsic reward but also allows for secondary gain, such as the ability to obtain housing and support independent activities of daily living in the community. Thus, extrinsic rewards are likely valued and highly salient in the context of vocational rehabilitation. Despite vocational successes in sheltered work settings, many participants do not achieve employment goals in the community[36] as evidenced by low rates of competitive job attainment and job tenure.[37,38] Although monetary gain is effective in promoting vocational outcomes within a rehabilitation setting, the generalizability of work therapy outcomes appears to be undermined by monetary disincentives to obtain work in the community, given provision of public disability income support programs.[39] Therefore, in addition to the extrinsic goal properties of work, among people with schizophrenia, work may need to have significant intrinsic goal properties such as interest, utility, and attainment value. Similar to a learning context in cognitive remediation, data suggest that perceptions of competence and expectations for success contribute to getting and maintaining employment in the community. Study data demonstrate the predictive value of self-appraisals and beliefs[40,41] for effective work behavior. Hope and self-esteem are positively associated with work performance and outcomes,[42] where as external locus of control is negatively associated with rates of competitive employment.[40] In addition, vocational rehabilitation studies have demonstrated an advantage for work therapy programs which incorporate therapeutic techniques to target self-appraisals and dysfunctional beliefs compared with work therapy programs which provide general supports as usual.[42,43] These studies indicate that while extrinsic rewards, such as monetary compensation, may be necessary to promote engagement in a supportive work setting, IM to work may play a key role in promoting the generalization of work behaviors and in sustaining vocational outcomes in the community.

Summary

Motivation is a key determinant of psychosocial treatment outcome and thus is increasingly being recognized as an important target for behavioral interventions. Research to date indicates that in a learning context, motivation systems in schizophrenia are qualitatively similar but quantitatively different from those of nonpsychiatric populations. Motivation theory and research from nonpsychiatric populations may thus serve as guideposts for the development of strategies to target low levels of IM during learning to augment treatment outcomes for people with schizophrenia. Research in schizophrenia samples indicates that intrinsic motivation

to learn is malleable and can change over time. Importantly, IM responds to interventions designed to augment motivation, and when IM to learn increases, so does the amount and persistence of learning. Preliminary research findings suggest that low base rate of IM in a learning context does not moderate response to IM enhancing interventions that are free of extrinsic reward. This suggests that there would be a role for such motivation enhancing techniques in schizophrenia patients who have a range of baseline IM levels. Future research needs to replicate these data and, given that extrinsic rewards may have a positive impact on learning, clarify the circumstances under which EM may be beneficial and/or necessary to optimally enhance IM and learning outcomes. Current data, however, suggest that EM alone is not sufficient to sustain and generalize persistent cognitive gains in people with schizophrenia.

Given that cognitive remediation is increasingly being paired with other psychosocial treatments like vocational training, the context-specific functions of motivation need to be appreciated. In a work context, extrinsic and IM operate in concert to affect vocational outcomes, but effective learning during cognitive remediation may be supported primarily by promoting IM. In both settings, the importance of supporting autonomy during learning is essential to optimally enhance immediate treatment gains and facilitate the maintenance and generalization of treatment gains to psychosocial functioning. This may be applied more broadly to a range of skills-based interventions in which motivation to learn is essential for treatment success.

Funding

Acknowledgments

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