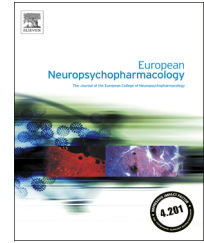




ELSEVIER

[www.elsevier.com/locate/euroneuro](http://www.elsevier.com/locate/euroneuro)



# The motivation and pleasure dimension of negative symptoms: Neural substrates and behavioral outputs



Ann M. Kring<sup>a,\*</sup>, Deanna M. Barch<sup>b,\*\*</sup>

<sup>a</sup>Department of Psychology, University of California, Berkley, CA, USA

<sup>b</sup>Departments of Psychology, Psychiatry and Radiology, Washington University, St. Louis, MO, USA

Received 21 March 2013; received in revised form 13 June 2013; accepted 23 June 2013

## KEYWORDS

Schizophrenia;  
Motivation;  
Pleasure;  
Neural substrates;  
Effort;  
Anticipation

## Abstract

A range of emotional and motivation impairments have long been clinically documented in people with schizophrenia, and there has been a resurgence of interest in understanding the psychological and neural mechanisms of the so-called “negative symptoms” in schizophrenia, given their lack of treatment responsiveness and their role in constraining function and life satisfaction in this illness. Negative symptoms comprise two domains, with the first covering diminished motivation and pleasure across a range of life domains and the second covering diminished verbal and non-verbal expression and communicative output. In this review, we focus on four aspects of the motivation/pleasure domain, providing a brief review of the behavioral and neural underpinnings of this domain. First, we cover liking or in-the-moment pleasure: immediate responses to pleasurable stimuli. Second, we cover anticipatory pleasure or wanting, which involves prediction of a forthcoming enjoyable outcome (reward) and feeling pleasure in anticipation of that outcome. Third, we address motivation, which comprises effort computation, which involves figuring out how much effort is needed to achieve a desired outcome, planning, and behavioral response. Finally, we cover the maintenance emotional states and behavioral responses. Throughout, we consider the behavioral manifestations and brain representations of these four aspects of motivation/pleasure deficits in schizophrenia. We conclude with directions for future research as well as implications for treatment.

© 2013 Elsevier B.V. and ECNP. All rights reserved.

## 1. Introduction

A range of emotional and motivation impairments have long been clinically documented in people with schizophrenia, and there has been a resurgence of interest in understanding the psychological and neural mechanisms of the negative symptoms in schizophrenia, given their lack of treatment responsiveness and their role in constraining function and life satisfaction in this illness. Negative

\*Corresponding author.

\*\*Corresponding author.

E-mail addresses: [akring@berkeley.edu](mailto:akring@berkeley.edu) (A.M. Kring), [dbarch@artsci.wustl.edu](mailto:dbarch@artsci.wustl.edu) (D.M. Barch).

<sup>1</sup>A coin toss was used to determine order of authors.

symptoms comprise five consensus-based domains: anhedonia, asociality, avolition, alogia, and blunted affect (Kirkpatrick et al., 2006). However, conceptual and empirical reviews of newer (e.g., CAINS; (Kring et al., 2013) or BNSS (Strauss et al., 2012)) and older (e.g., SANS; (Andreasen, 1982)) interview-based measures of negative symptoms indicate that a two-factor model more parsimoniously describes the negative symptoms (Blanchard and Cohen, 2006; Kimhy et al., 2006; Messinger et al., 2011). The first factor reflects diminished motivation and pleasure across a range of life domains; the second factor reflects diminished verbal and non-verbal expression and communicative output. Newer measurement techniques for these two domains—motivation/pleasure and expression—may better capture the underlying mechanisms giving rise to negative symptoms (Blanchard and Cohen, 2006; Kring et al., 2013) and help in developing more effective treatments. In this review, we focus on the motivation/pleasure domain, providing a brief review of the behavioral and neural underpinnings of this domain.

We have argued elsewhere that adopting a translational approach to research on negative symptoms has and will continue to give us the greatest purchase toward more clearly identifying mechanisms of negative symptoms and developing more effective and targeted treatments (Barch and Dowd, 2010; Kring and Elis, 2013). Indeed, adopting the methods, theories, and measures of affective science, as well as translating from the animal and human affective and cognitive neuroscience, has propelled us ever closer to identifying core deficits that give rise to motivation/pleasure deficits in schizophrenia and other disorders. Independently, we have developed theoretical frameworks to guide our research on the emotional and motivational underpinnings of negative symptoms, highlighting how these deficits necessarily also involve behavior and brain regions that are crucial for cognitive control. Both of us have translated animal and human cognitive and affective neuroscience research to our models of motivation/pleasure deficits in schizophrenia. Kring and colleagues have argued for the importance of characterizing the time course of emotion to distinguish among anticipatory, consummatory (“in-the-moment”), and maintenance of emotion responding (see Fig. 1). Relatedly, Barch and colleagues have argued for the importance of representations about motivationally salient incentives necessary to develop and actively maintain behavioral plans that are necessary to achieve desired pleasurable outcomes (see Fig. 2).

In this review, we integrate our approaches to highlight the latest advances in our understanding of behavioral and

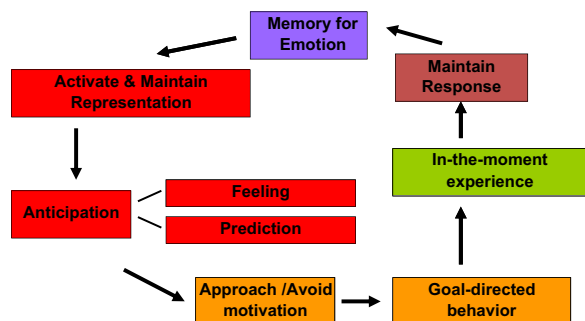


Fig. 1 Temporal experience of emotion.

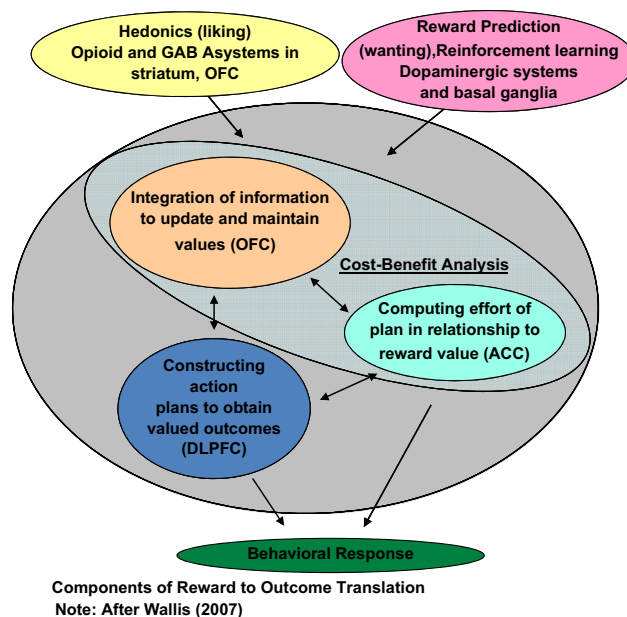


Fig. 2 Reward to outcome translation.

brain systems that contribute to diminished motivation and pleasure in schizophrenia (see Fig. 3). Specifically, we focus on four common aspects of our models. First, we cover liking or in-the-moment pleasure, which involves immediate responses to pleasurable stimuli. Second, we cover anticipatory pleasure or wanting, which involves a prediction about a future enjoyable outcome (reward) and/or a feeling of pleasure in anticipation of that outcome. Third, we address motivation, which includes a calculation of how much effort is needed to achieve a desired outcome (reward), a plan of how to obtain that outcome, and the actual behavioral response to get the reward. Finally, we cover the maintenance of emotional states and behavioral responses. Throughout, we consider the behavioral manifestations and brain representations of these four aspects of motivation/pleasure deficits in schizophrenia.

## 2. In-the-moment emotional experience in schizophrenia

In-the-moment experience in our models refers to the responses people provide when presented with putatively positive things. That is, how do people report feeling when presented with funny pictures, tasty foods, or reward of \$5? This in-the-moment experience is called consummatory pleasure or “liking” in some human and animal models (see Table 1). In this section, we review the evidence on the behavioral and brain responses people with schizophrenia exhibit when presented with positive stimuli.

Although people with schizophrenia often report limited experiences of positive emotion during interview based clinical assessments (Horan et al., 2006), behavioral research tells a different story. Specifically, one of the most well-replicated findings in schizophrenia research is that people with schizophrenia report experiencing similar (or slightly less) amounts of positive emotion compared to those without schizophrenia

Download English Version:

<https://daneshyari.com/en/article/10299014>

Download Persian Version:

<https://daneshyari.com/article/10299014>

[Daneshyari.com](https://daneshyari.com)