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Review article

The role of physiological arousal in the management of challenging behaviours in individuals with autistic spectrum disorders



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ABSTRACT

Challenging behaviours restrict opportunities and choices for people with autistic spectrum disorders (ASD) and frequently lead to inappropriate and costly service interventions. Managing challenging behaviours of people with autism is an important area of research. This paper examines some of the evidence for the role of physiological arousal influencing these behaviours. Evidence from the emerging literature about sensory differences is examined. It is proposed that sensory reactivity is associated with *hyperarousal*; catatonic type behaviours are associated with low levels of reactivity (*hypoarousal*). A low arousal approach is proposed as a generalised strategy to managing challenging behaviours with ASD. The use of non-contingent reinforcement and antecedent control strategies are recommended for use with challenging behaviours which have a sensory component. Examples are provided to illustrate the approach. The implications of arousal and the use of physical interventions are discussed. It is proposed that arousal is a construct which has significant heuristic value for researchers and practitioners.

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1. Introduction

People with autistic spectrum disorders (ASD) can present behaviours that challenge and a recent survey of the behavioural intervention literature identified a diagnosis of autism as a risk marker for physical aggression (McClintock, Hall, & Oliver, 2003). A large number of behavioural intervention studies have tended to focus on long term interventions for physical aggression (Horner, Carr, Strain, Todd, & Reed, 2000) with short term management receiving less attention (McDonnell, 2010).

This paper will examine the low arousal approach to managing challenging behaviours in people with ASD (McDonnell, Waters, & Jones, 2002). This approach has become popular with autism services in the UK and Europe. The low arousal approach emphasises a range of behaviour management strategies that focus on the reduction of physiological arousal and manipulation of antecedent triggers to prevent aggression and crisis strategies which avoid punitive consequences and seek low intensity solutions. The approach seeks to understand the role of sensory factors in the onset and maintenance of challenging behaviours in people with ASD. It will be argued that such an approach can greatly enhance crisis management strategies, functional assessment, and positive behaviour support strategies. The implications for the application of physical interventions will also be discussed.

1.1. Arousal and emotion

Arousal is a construct which has proved difficult to define with researchers adopting views that it is either a unitary or multifaceted construct; recent research in neurobiology indicates that there is a generalised arousal mechanism in the brain which feeds cortical functions (Pfaff, 2005). “Generalised arousal is higher in an animal or human being who is; (S) more alert to sensory stimuli of all sorts, and (M) more motorically active, and (E) more reactive emotionally” (Pfaff, 2005, p. 5). This relatively simple definition relates arousal to information processing; novel, unpredictable stimuli will lead to an increased arousal response. The link between arousal and information processing was originally described by Yerkes and Dodson (1908). The law maintains that performance and arousal are linked in a classic inverted U shape; the Yerkes Dodson law proposes that high levels of arousal lead to decreases in human performance. The original study examined the performance of mice in a learning task where electric shocks were delivered for incorrect responses and has been used as an analogy to show arousal reducing information processing has an optimum level (Easterbrook, 1959). Critics of the Yerkes Dodson law often cite the case that high levels of arousal have survival value (Zajonc, 1980) and, in some circumstances, may increase performance (Hanoch & Vitouch, 2004). Despite these criticisms, the construct of arousal is considered useful in understanding the regulation of emotion (Pfaff, 2005) and both arousal and stress are considered to be important in the moderation of emotions (Reich & Zautra, 2002). To summarise there would appear to be a consensus that high states of arousal can have a negative effect on human performance.

1.2. The link between arousal and autism

Physiological arousal is not a new construct and has long been implicated in autistic spectrum disorders (Hutt, Hutt, Lee, & Ounsted, 1964). Two implications of this are that children and adults with ASD would be more reactive to sensory stimuli than the normal population and that they may be slower to habituate to stimuli. There is some laboratory evidence of differences in physiological responses of individuals with ASD compared to non autistic controls (Althaus et al., 2000; Hirstein, Iversen, & Ramachandran, 2001; Van Engeland, Roelofs, Verbaten, & Slangen, 1991).

There is mixed evidence across the spectrum for increased and decreased arousal in response to predicted stressors. Jansen et al. (2006) compared adults with ASD with non ASD adults in their response to public speaking and found that individuals with ASD showed decreased heart rate, but normal cortisol responses. Goodwin et al. (2006) compared children and reported higher baseline heart rates of ASD participants. Hirstein et al. (2001) reported unusually high and unusually low baseline skin conductance responses in autistic children compared to non autistic controls. These differences require replication using larger samples but there is an intriguing possibility that there may be considerable variation in physiological reactivity of both autistic children and adults.

Jennett, Hagopian, and Beaulieu (2011) investigated the relation between self-injury and arousal in an individual with autism under different conditions of restraint. When some form of restraint was used the heart rate of the individual remained close to the resting heart rate although, when this restraint was removed or signalled to be removed, the individual's heart rate increased dramatically within a short time period.

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