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Elucidating the Cognitive Mechanisms Underpinning Behavioural Activation

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Mecanismos cognitivos que sustentan la activación conductual

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Abstract.
Depression represents a pervasive and devastating psychological difficulty. It affects over 21% of the population at some point in their lives and can have an unimaginable impact on both individuals and society. Behavioural activation represents a popular intervention for depression and is commonly used by psychologists internationally. Despite its popularity, the cognitive mechanisms underpinning the efficacy of behavioural activation remain elusive. This paper will review the literature on this intervention and propose an account of the cognitive mechanisms underlying its therapeutic efficacy. Specifically, it is argued that behavioural activation is effective because it increases both the density of outcomes in ones environment and the density of highly salient action-outcome contingencies, which may otherwise be absent due to reduced motivation. The clinical implications are subsequently discussed, with reference to future research.

Resumen.
La depresión representa un trastorno del estado de ánimo generalizado y devastador. Afecta a más del 21% de la población a lo largo de su vida y puede tener un impacto enorme, tanto en los individuos como en la sociedad. La activación conductual constituye una intervención popular para la depresión y es comúnmente utilizada por los psicólogos a nivel internacional. A pesar de su renombre, los mecanismos cognitivos que sustentan la eficacia de la activación conductual siguen siendo elusivos. Este artículo analiza la literatura sobre esta intervención y se propone una explicación de los mecanismos cognitivos que subyacen a su eficacia terapéutica. En concreto, se argumenta que la activación conductual es eficaz porque aumenta tanto la frecuencia de los resultados en su entorno como la frecuencia de las contingencias de acción-resultado más destacadas, las cuales, de otro modo, podrían estar ausentes debido a una motivación disminuida. A continuación, se discuten las implicaciones clínicas, con referencia a la investigación futura.

Keywords.
Depression, Behavioural Activation, Associative Learning.
Palabras Clave.
Depresión, Activación comportamental, Aprendizaje asociativo.

1. Introduction

Depression is characterised by persistent low mood, despondency and loss of interest in activities that were previously pleasurable (APA, 2013); such experiences can be accompanied by weight loss, physical and cognitive fatigue, feelings of worthlessness and suicidal thoughts/ideation. This psychological difficulty affects over 21% of the population at some point in their lives (Auerbach et al., 2018) and can have incalculably large ramifications on both individuals' lives and society as a whole.

Contemporary approaches in clinical psychology strongly advocate the use of cognitive behavioural therapy (CBT) as an intervention for depression (Westbrook et al., 2011). This involves exploring the relationship between psychological distress and one's thoughts, behaviours, emotions, and physical sensations, as well as taking action to alter the content of the respective facets in an endeavour to improve wellbeing (Johnstone & Dallos, 2013; Myles & Merlo, 2021; Tarrier et al., 2000; Westbrook et al., 2011). Behavioural Activation (BA) represents a popular intervention for depression and is frequently incorporated into CBT protocols (Veale, 2008); however, despite its popularity and significant empirical support, the cognitive mechanisms underpinning the efficacy of BA remain elusive. Previous theorists have postulated that behavioural activation serves to reduce depressive symptomology by promoting engagement with avoided activities and developing clients' understanding of the functional basis of their avoidance (Martell et al., 2001; Veale, 2008). This paper will review the literature on BA and propose an account of the cognitive mechanisms underlying the therapeutic efficacy of this intervention. For clarity, cognitive mechanisms are defined as the conscious and unconscious psychological mechanisms that encode information, process information, and produce cognitive or behavioural output (see Myles, 2021a).

2. Behavioural Activation

Behavioural activation is a popular and empirically well-supported therapeutic technique that is often used to alleviate noxious experiences associated with a diagnosis of depression. It consists of scheduling value-guided activities, particularly those that one may be avoiding, into one's diary and ensuring adherence to the respective activities (Veale, 2008). Additionally, BA often involves identifying activities that one could be doing better or more of, such as exercise (Myles, 2020a), and engaging in them accordingly. For example, individuals that previously enjoyed and derived meaning from sailing, but stopped due to feelings of low mood, may be prompted by therapists to re-engage with the sport. There are increasingly complex variations of BA that have been tailored to specific psychological difficulties; however, discussion of these variations is beyond the scope of this ar-

ticle and can be found elsewhere in the literature (Hopko et al., 2016; Martin & Oliver, 2019; Martínez-Vispo et al., 2018; Welsh et al., 2016).

Contemporary literature strongly advocates the use of BA as an intervention for depression, with demonstrations that engaging in BA is associated with a reduction in depressive symptomology (Chartier & Provencher, 2013; Kanter et al., 2012; Masterson et al., 2014; Tindall et al., 2017; Veale, 2008). Indeed, meta-analytic data has also ascertained evidence for the efficacy of BA as an intervention for people with a diagnosis of depression (Ekers et al., 2014; Mazzucchelli et al., 2009; Orgeta et al., 2017), with indications that its efficacy is comparable to, or even greater than, antidepressants (Dimidjian et al., 2006; Ekers et al., 2014; Moradveisi et al., 2013) and cognitive behavioural therapy (Dimidjian et al., 2006; Jacobson et al., 2001; Richards et al., 2016). Despite significant empirical support for the efficacy of BA and its extensive use as an intervention for depression, discussion in the literature has focused largely on the role of positive reinforcement in increasing the frequency of behaviours (Kanter et al., 2012). Accordingly, the other cognitive mechanisms underpinning the efficacy of BA have been neglected and thus remain elusive. Examining these cognitive mechanisms is of critical importance in developing both models of psychological difficulties and improved psychological interventions for individuals with a diagnosis of depression (Myles, 2021a, 2021b).

3. Behavioural Activation and Perceived Control

In order to understand the cognitive mechanisms affected by BA, one must understand the relationship between perceived control and depressive symptomology. Seminal theoretical models of depression argued that the perceived absence of the ability to modulate contingencies in one's environment culminates in a perceived absence of control, resulting in the manifestation of depressive symptomology (Abramson et al., 1978; Cohen et al., 1976; Abramson et al., 1989; Seligman, 1975). Early experimental evidence for this comes from demonstrations that individuals with a diagnosis of depression perceive the contingency between their actions and an outcome to be lower than individuals without a diagnosis of depression (Alloy & Abramson, 1979), indicating that individuals with depression maintain a lower perception of control (Seligman, 1975). Indeed, this represents a robust finding and has been well substantiated in subsequent research (Alloy et al., 1985; Martin et al., 1984; Vázquez, 1987).

Contemporary literature continues to support the notion that perceived control maintains a critical role in psychological welfare. Evidence for this comes from a multitude of studies reporting that the extent to which individuals perceive that they are in control over their

lives is inversely related to symptoms of depression, such that those with greater perceived control exhibit reduce depressive symptomology (Bjørkløf et al., 2016; Cheng et al., 2013; Crandall et al., 2018; Kleinberg et al., 2013; Myles et al., 2020; Myles et al., 2021; Volz et al., 2018). Furthermore, longitudinal data indicates that the relationship between perceived control and depressive symptomology may be causal, with evidence that decrements in perceived control precede the manifestation of depression (Bjørkløf et al., 2018; Hamilton & Abramson, 1983; Myles, 2020a, 2020b; Tobin & Raymundo, 2010). The concept of perceived control has been extended to 'locus of control', pertaining to a generalised belief system regarding the extent to which individuals perceive they have control over their lives (Lefcourt, 1991; Visdómine-Lozano, 2015). Accordingly, perceived control is not limited to isolated events and instead represents a generalised perception of control over one's life. These results strongly advocate the critical role of perceived control in maintaining ones psychological welfare.

4. The Cognitive Mechanisms Underpinning the Therapeutic Efficacy of Behavioural Activation

There are three distinct but related cognitive mechanisms that may underly the therapeutic efficacy of BA. The first mechanism relates to the influence of BA on 'outcome density', referring to the frequency with which an outcome occurs in a series of action-outcome contingencies. Behavioural activation encourages individuals to undertake a greater number of actions in their environment (Veale, 2008), which will, by definition, increase the number of action-outcome contingencies. Whilst this may not influence the extent to which the outcome is contingent upon ones actions, it will increase the density of outcomes that occur (Haselgrove & Hogarth, 2013). Evidence for the importance of outcome density in perceived control comes from a study by Baker et al. (2013, p. 160), who asked individuals with a diagnosis of depression to estimate the perceived contingency between pressing a button (action) and the illumination of a light (outcome). In one phase, there was a high outcome density, such that there were a greater number of outcomes (light illuminations). In the other phase, there was a low outcome density, such that there were a fewer number of outcomes (light illuminations). Critically, the contingency between the action and the outcome was equal in both experiments. The authors reported that participants with a diagnosis of depression perceived a greater contingency, and consequently maintained a superior perception of control (Abramson et al., 1978; Abramson et al., 1989; Seligman, 1975), between their action and the outcome in the high outcome density condition than in the low outcome density condition. Thus, one can assume that a greater number of

outcomes in ones environment, irrespective of the contingency between one's actions and outcomes, manifests an elevated perception of control.

These results indicate that BA is effective because it encourages individuals to undertake a larger number of actions in their environments, resulting in a greater density of outcomes. Whilst this may not impact the true contingency between actions and outcomes, it culminates in an elevated perception of control and consequently reduced depressive symptomology (Bjørkløf et al., 2016; Bjørkløf et al., 2018; Cheng et al., 2013; Crandall et al., 2018; Hamilton & Abramson, 1983; Kleinberg et al., 2013; Myles, 2020a; Myles, 2020b; Myles et al., 2020; Tobin & Raymundo, 2010; Volz et al., 2018). Moreover, if this elevated perception of control generalises to other activities, it may serve to perpetuate an increasing sense of empowerment across aspects of the individual's life (Lefcourt, 1991; Visdómine-Lozano, 2015).

The second mechanism that may underpin the therapeutic efficacy of BA concerns the particularly high salience of action-outcome eventualities in contingency experiments. Four eventualities can influence the true relationship between an action and an outcome: firstly, actions can be followed by an outcome, referred to as 'action-outcome' events; secondly, actions can be followed by the absence of an outcome, referred to as 'action-no outcome' events; thirdly, an outcome can occur in the absence of the action, termed 'no action-outcome' events; finally, both the action and outcome can be absent, termed 'no action-no outcome' events. Clearly, action-outcome and no action-no outcome events increase the contingency between the action and the outcome, whereas action-no outcome and no action-outcome events reduce the contingency between the action and the outcome. However, participants do not necessarily perceive the true contingency and there are various factors that influence the extent to which participants view the outcome to be contingent upon the action, one of which is the salience of the respective eventualities. Contemporary literature indicates that the salience of action-outcome eventualities is greater than the salience of other eventualities (Haselgrove & Hogarth, 2013; Vallée-Tourangeau et al., 1998; Wasserman et al., 1990). As stimulus salience is critical for learning, such that more salient stimuli acquire greater associative strength (Mackintosh, 1975; Miller et al., 1995; Pearce & Hall, 1980; Rescorla, 1972; Wagner, 2014), then one might assume that the occurrence of action-outcome eventualities has a disproportionately large influence over one's perception of the extent to which outcomes are contingent upon the action.

As previously discussed, BA increases the density of outcomes, which necessitates increasing the number of action-outcome occurrences. As action-outcome events are particularly salient and consequently disproportionately weighted when evaluating the contingency between actions and outcomes, a greater density of outcomes re-

sults in a stronger perceived contingency between one's actions and the outcome. This will manifest an elevated perception of control for the aforementioned reasons (Abramson et al., 1978; Abramson et al., 1989; Seligman, 1975), resulting in a reduction in depressive symptomology (Bjørkløf et al., 2016; Bjørkløf et al., 2018; Cheng et al., 2013; Crandall et al., 2018; Hamilton & Abramson, 1983; Kleinberg et al., 2013; Myles, 2020a; Myles, 2020b; Myles et al., 2020; Tobin & Raymundo, 2010; Volz et al., 2018).

Finally, motivation to undertake actions also influences the extent to which individuals perceive they are in control of their environment. Baker et al. (2013, p. 170) reported that participants classified as 'depressed' undertake fewer actions in the aforementioned contingency experiments, resulting in fewer overall action-outcome contingencies. These results indicate that individuals that display greater depressive symptomology possess a lower motivation to initiate action in their environments. Indeed, this conclusion is supported by more ecological data, with evidence that individuals experiencing symptoms of depression display a reduced motivation to act in their environments (Burns et al., 2013; Grahek et al., 2019; Sherdell et al., 2012; Westbrook et al., 2011). This will culminate in a lower density of outcomes, which will have a maladaptive impact on psychological welfare, as previously described.

5. Clinical Implications and Future Research

The clinical implications of this literature are clear: use BA as an intervention to reduce depressive symptomology. Behavioural activation combats each of the cognitive mechanisms that have been hypothesised to underlie experiences of depression by increasing the density of outcomes, the salience of one's own control over the environment, and the number of actions one undertakes, even in the absence of motivation. Whilst the authors are reluctant to extend the implications for therapeutic practice beyond the data, there are numerous adaptations clinicians may find helpful when undertaking therapy. Specifically, it may be helpful for clinicians to emphasise to clients that engagement with tasks, regardless of whether they are 'successful' in achieving a desired goal, can be therapeutic, as task engagement leads to increments in outcome density, even in the absence of motivation; however, such approaches should be undertaken at the clinicians discretion. Furthermore, clinicians may find it helpful to draw attention to instances when clients engage in tasks that culminate in the production of the desired outcome (Merlo et al., 2022), thereby further enhancing the salience of action-outcome contingencies. More generally, understanding the cognitive mechanisms underpinning the efficacy of psychological interventions is critical for both understanding

the nature of depressive symptomology and developing novel interventions to better support individuals with psychological difficulties. Accordingly, it is critical that therapists utilise BA as an intervention for individuals with symptoms of depression.

However, it is important to note that this paper does not indicate that therapists should not utilise other therapeutic tools, such as cognitive therapy, as there is significant supportive evidence for the efficacy of such interventions (Johnstone & Dallos, 2013; Tarrier et al., 2000; Westbrook et al., 2011). Instead, it is advisable that therapists utilise these tools in conjunction with BA, to provide a more holistic form of support for service-users.

6. Concluding Comments

Behavioural activation represents a remarkably effective intervention for individuals with symptoms of depression. However, to date, the literature has lacked a comprehensive account of the cognitive mechanisms underpinning the therapeutic efficacy of this intervention. This paper posits that greater outcome density, action-outcome salience, and initiation of actions, emulating elevated motivation, represent the distinct, but related, cognitive mechanisms underpinning the therapeutic efficacy of BA. It is critical that clinicians continue to utilise this invaluable intervention to support individuals with symptoms of depression.

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