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Exploring the Potential of Case Formulation Within Exercise Psychology

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The purpose of this article is to expand the literature on case formulation as a clinical tool for use within exercise psychology, generally and lifestyle behavior change interventions, specifically. Existing research offers limited support for the efficacy of current physical activity behavior change intervention strategies, particularly in the long-term. The present paper argues that intervention strategies need to pay greater attention to the complex and individualistic nature of exercise and health related behaviors. It has been suggested that existing intervention designs tend to conform to a medical model approach, which can at times potentially neglect the complex array of personal and situational factors that impact on human motivation and behavior. Case formulation is presented as a means of encouraging a dynamic and comprehensive approach to the development and implementation of practical interventions within the health behavior change field. The adoption of these clinical techniques may facilitate the careful consideration of variations in the development, manifestation, and maintaining mechanisms of problematic behaviors (e.g., inactivity). An overview of case formulation in its different forms is presented alongside a justification for its use within exercise psychology.

Keywords: case formulation, health behaviors, physical activity, exercise psychology

Research reports present compelling scientific evidence to support the health benefits of regular physical activity (PA; Penedo & Dahn, 2005). As a consequence, PA is an increasingly important factor in the treatment and prevention of a wide variety of chronic physical and mental health conditions (Roberts & Barnard, 2005; Saxena, Van Ommeron, Tang, & Armstrong, 2005). Within the United Kingdom (UK), the potential economic benefits of increased PA were highlighted when the annual cost of physical inactivity was estimated at £8.2 billion (Department of Health, 2004). Despite these well-publicized benefits, however, UK data reveal an

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increase in both the prevalence of the conditions listed above and the number of people who remain sedentary (Department of Health; McPherson, Marsh, & Brown, 2007; Sport England, 2008). Although a wide range of PA intervention strategies have been developed and implemented, research evidence has demonstrated limited support for their efficacy. While short-term changes may be noted, long-term changes (i.e., maintenance) appear to be much more difficult to achieve (Hillsdon, Foster, Cavill, Combie, & Naidoo, 2005; Kahn et al., 2002).

The Medical Model

In the majority of healthcare settings, the treatment framework adopted conforms to a philosophy of classifying people according to their presenting symptoms, which in turn, are matched to a specific treatment (Wade & Halligan, 2004). This “medical model” approach is likely to have considerable merit in situations where evidence demonstrates that a diagnosis or classification is closely associated with a common etiology, prognosis, and course of treatment. For example, a patient may present her or his medical doctor with symptoms such as a painful, inflamed lesion that is accompanied by a fever. The patient may also explain the possible cause of the lesion (e.g., a bite from a dog). When presented with this information, the medical doctor will know that these symptoms and the linked etiology are commonly associated with the diagnosis of an infection and that the typical treatment is a course of antibiotics. This process of diagnostic labeling or symptom matching serves a number of useful functions. First, it facilitates the identification of a proven treatment for the presenting problem by identifying the underlying cause(s) of the problem (etiology) and matching it with an appropriate course of treatment. A diagnosis also helps aid prediction of what is likely to happen, because a recognized condition may have a typical history and course (Mace & Binyon, 2005). In addition, this approach facilitates the ordering of information regarding specific problems to provide a body of expert knowledge and a common language through which different health professionals and researchers can communicate (Carr & McNulty, 2006).

Despite the multiple benefits of the medical model, if a common etiology and prognosis cannot be identified, attempts to apply diagnostic labeling are likely to hinder the treatment process. For example, if a problem is deemed to be closely intertwined with a person’s own history and personal experiences, then the predictability, in terms of identifying a common cause and prognosis, is likely to be lacking (Mace & Binyon, 2005). Consequently, it may be ineffective to apply an inflexible, standardized course of treatment. Therefore, a more individualistic process may at times be required to identify the underlying causes, maintaining factors, and a client/patient-centered plan.

Promoting Physical Activity

A lack of physical activity is often identified as the potential cause of a range of physical and mental health problems (Roberts & Barnard, 2005; Saxena, Van Ommen, Tang, & Armstrong, 2005). In response to this, the medical model dictates that health professionals (e.g., family physicians, general practitioners) should

prescribe an increase in daily or weekly physical activity as an appropriate treatment. In the United Kingdom, this is commonly achieved through Physical Activity Referral Schemes (PARS), which describes a process whereby patients are referred from primary care providers to undertake a prescribed program of supervised PA (e.g., Gidlow et al., 2007). These programs usually last for approximately 10–12 weeks (Gidlow, Johnston, Crone, & James, 2005). Yet despite a rapid increase in the number of PARS and community exercise programs, there is a lack of solid evidence for their effectiveness (Dugdill, Graham, & McNair, 2005; Williams, Hendry, France, Lewis, & Wilkinson, 2007). Research highlights that adherence to these schemes after initial referral can be as low as 20–30% (Dugdill et al., 2005; Gidlow et al., 2005) and for those that do complete the schemes, increases in PA levels are rarely sustained over time (Morgan, 2005). There is also evidence to suggest that PARS may only address the needs of specific populations (Gidlow et al., 2007; James et al., 2008, 2009; Morgan, 2005). Consequently, as a treatment, this has not proven to be particularly effective.

Poor treatment outcomes when adopting a medical model approach could possibly suggest that the diagnosis has failed to identify the underlying problem, and as a consequence, the treatment may not be addressing the real issue. For example, while sedentary behavior may have resulted in someone developing physical health problems, the underlying cause of the inactivity may be complex, multifaceted, and individualistic. When an individual is labeled as sedentary and lacking in motivation, the underlying causes of this are unlikely to be generalizable. Consequently, prescribing PA to combat the symptoms of cardiovascular disease is arguably akin to placing an Elastoplast on an infected wound, because the solution does not address the root of the problem. Since the beginning, the field of psychology has made an important distinction between people's overt difficulties, which are observable (e.g., being overweight, lack of motivation to engage in PA) and the underlying psychological mechanisms that underpin those overt difficulties (e.g., low self-esteem, depression; Persons, 1989). Therefore, while diagnostic labeling may help identify and diagnose people's overt difficulties, they are unlikely to consistently elicit the underlying psychological mechanisms that cause and maintain those difficulties.

In sport psychology, previous calls have been made for the need to encourage a better understanding of the fundamental mechanisms *underlying* people's athletic performance and personal and performance concerns (Gardner & Moore, 2005; Gardner, 2009). Within exercise psychology, although a considerable body of literature exists that addresses the underlying psychological mechanisms associated with PA behaviors, the interventions being developed and tested still appear to operate at a generalizable level. For example, to understand how and why people initiate and engage in PA, the field of exercise psychology has adopted theoretical frameworks from health and social psychology (see Biddle & Mutrie, 2008). These frameworks provide potentially valuable insights into the correlates and processes associated with PA participation and other health behaviors. Consequently, they are used to inform future research in this area and the design and delivery of PA behavior change interventions. However, these theories and models represent general frameworks, designed to operate at a *macro* level and should not be viewed as formal blueprints that are directly applicable to all individual cases. There is also no single theory or model that specifically explains how best to assist individuals in adopting habitual PA behaviors (Marcus & Forsyth, 2003). Consequently, due

to the explanatory level at which existing theories operate, they cannot be applied according to a “one size fits all” philosophy. Instead, they should be used as *guiding* frameworks to direct the development of broad interventions, which then need to be applied at a person-specific, tailored level. Although it would be incorrect to assume that exercise psychology practitioners are not aware of this need, a key problem in this respect is that there is no agreed upon framework within which to design, deliver, and implement personalized client-focused packages in exercise psychology.

The transtheoretical model (TTM) is one frequently adopted theoretical framework used to inform the development and implementation of PA interventions (Breckon, Johnston, & Hutchison, 2008). Central to interventions based on the TTM is the concept of *stage-matching*, whereby people are classified according to a type of readiness continuum. While this provides a useful overview of the extent to which a person is motivated to engage in PA, it does not conceptualize and explain why this is the case. Despite this, the TTM is arguably being used to inform a classification system, which allows for a diagnostic label to be applied and subsequent standardized solution to be identified. To facilitate this process, another dimension of TTM is the *processes of change*. These are ten strategies that describe the techniques that individuals use to modify their cognitions, emotions, and behaviors (Prochaska & Norcross, 1994). The first five processes of change (consciousness raising, dramatic relief, environmental reevaluation, social liberation, and self-reevaluation), which are commonly classified as experiential, have been shown to be associated with the earlier stages of change (Velicer et al., 1998). The last five processes of change (stimulus control, helping relationships, counter conditioning, reinforcement management, and self-liberation), classified as behavioral, are hypothesized to be associated with the later stage transitions (Velicer et al., 1998). Consequently, the TTM lends itself to a medical model philosophy, whereby individuals can be categorized according to a specific stage of change and then matched with an intervention that encourages them to experience specific processes of change, to achieve stage progression. While it could be argued that these popular stage-matched interventions do represent individually tailored approaches, at no point do they attempt to identify a motivational etiology. Instead, they focus on matching solutions to motivational symptoms but not their underlying causes.

In addition, existing PA intervention practices tend to acknowledge the extent to which people meet the American College of Sports Medicine’s (ACSM) PA guidelines¹ (Haskell et al., 2007) as a primary outcome (Gidlow & Murphy, 2009). These represent physiology-centered recommendations dictated by a dose-response relationship inherent in the evidence-based literature. Consequently, current intervention strategies (e.g., UK based PARS) are primarily physiologically and not psychologically driven. Arguably, they need to include both components. This can be seen within existing PARS initiatives that often differentiate between physical and mental health referrals (Crone, Johnston, Gidlow, Henley, & James, 2008). Recent evidence suggests that mental health referrals have considerably lower adherence rates compared with physical health referrals (James et al., 2009). Consequently, existing PARS may be less well equipped to address people’s needs from a psychological perspective. It could also be argued that it is inappropriate to differentiate between physical and mental health referrals if it is accepted that a relationship exists between individuals’ observable difficulties (e.g., being

overweight) and the underlying psychological mechanisms that underpin those overt difficulties (e.g., low self-esteem, depression, interpersonal issues associated with personality disorders).

In summary, while exercise psychology is well developed as a theoretical discipline, research suggests that practices in this setting are less well advanced. Consequently, for exercise psychology to develop as an applied discipline, there may be a need to look beyond simply a medical model philosophy of treatment and prevention. Mechanisms ultimately need to be identified that can help practitioners relate existing theory to practice in such a way that recognizes the complex, individualistic nature of exercise and health related behaviors. As such, the remaining sections of this article introduce and examine the potential of case formulation in exercise psychology as a means of facilitating the careful consideration of variations in the development, manifestation, and maintaining mechanisms of people's problematic health behaviors (e.g., inactivity).

Case Formulation

To encourage the development of more effective strategies for facilitating successful PA behavior change, it may be useful to look beyond the exercise psychology knowledge base and consider a wider body of literature within other domains of psychology. The concept of formulation emerged within the clinical psychology literature in the 1950s (Crellin, 1998). It was discussed within the context of psychological assessment as offering a distinctive role compared with psychiatric diagnosis (i.e., the medical model approach). *Case formulation* refers to the process of performing an individualized assessment of clinical cases that is sensitive to variations in the development, manifestation, and maintaining mechanisms of individuals' psychological problems (Tarrier, 2006). Therefore, it accounts for the limitations associated with a medical model approach (i.e., treating people in the same way because they demonstrate particular symptoms but for very different reasons). Although case formulation is central to the day-to-day practice of clinical psychology, it has only relatively recently begun to emerge in other areas of applied psychology. For example, Gardner and Moore (2005) highlighted the potential benefits of case formulation within sport psychology by demonstrating how it can help practitioners conceptualize and respond appropriately to the unique issues and concerns of the individual athletes with whom they work. The current paper therefore seeks to build upon Gardner and Moore's work and demonstrate the potential of case formulation specifically within exercise psychology and other health behavior change settings.

Tarrier (2006) has stated that the likely forerunner to the concept of a case formulation was a seminal paper by Kanfer and Saslow (1965). In that paper, the authors argued for a paradigm shift away from the dominant medical model to a psychological formulation of mental health difficulties. Kanfer and Saslow critiqued the concept of a medical diagnosis on the basis that it can potentially reduce a complex array of factors to a crude taxonomic classification. Based on this argument, case formulation² was long ago proposed as a pragmatic alternative to diagnostic symptom matching (see Tarrier, 2006). Therefore, parallels can be drawn between the rationale behind the implementation of case formulation in

clinical psychology, and the problems within exercise psychology, as highlighted in the present paper. Consequently, the adoption of a case formulation approach within exercise psychology may facilitate the development of more individualistic approaches to the psychology of PA behavior change. To explore the potential of case formulation in exercise psychology, the subsequent sections of this paper provide an overview of case formulation and demonstrate how it may be used to enhance practice within exercise psychology.

Defining the Concept of Case Formulation

Since the concept of case formulation was first introduced in the clinical psychology domain, it has been interpreted and described in a variety of different ways based on different theoretical perspectives and therapeutic models. Earlier case formulation definitions, rooted in the cognitive behavioral theory/therapy (CBT) approach, appear to emphasize that formulations are theory driven and that a hypothesis testing approach is required to understand a patient's problems and how to approach treatment. It involves collecting and assimilating relevant information, which should be shared with the client to check, aid, and refine interpretation and meaning. Yet even though Beck's early descriptions of cognitive therapy promoted a process of "collaborative empiricism" (e.g., Beck, Rush, Shaw, & Emery, 1979), Johnstone and Dallos (2006) point out that in some early CBT-oriented definitions of case formulation, the perspective of the client was often overshadowed. Today, collaboration is frequently noted as a crucial defining feature of a CBT-based formulation (Tarrier, 2006). This sentiment is central to the definition by Harper and Moss (2003), where formulation is viewed as being "engaged in a process of collaborative sense making" (p. 8). Clearly, case formulation is seen as a *process* that should be continually revisited to reformulate a client's difficulties as new information is discovered. Most current CBT-based definitions of case formulation stress the importance of the factors that have influenced the origins, development, and maintenance of the client's problems (e.g., Dudley & Kuyken, 2006).

In reviewing the background and defining characteristics of case formulations, it is clear that the dominant paradigm has shaped our understanding. Psychological case formulation can even be viewed on an epistemological continuum ranging from the dominant positivistic CBT standpoint (e.g., Dudley & Kuyken, 2006) to the social constructionist (e.g., Harper & Spellman, 2006) and social inequalities perspectives (e.g., Miller & McClelland, 2006). From a positivistic standpoint, the core assumption is that there is an objective truth *out there* and that the accuracy of a formulation can be assessed using scientific principles (e.g., Butler, 1998; Eells, 1997). Consequently, a case formulation appears to represent a process of developing a case-specific theory about a client's presenting issues, which can then be tested through the application of a range of treatment strategies and methods. Perhaps a possible implication from these largely positivistic definitions is that it is something that is *done to* a client when the clinician has "acquired" the necessary information from the assessment or the data collection process. From a social constructionist position, it would be argued that "we largely construct our realities, which inevitably leads to multiple perspectives on that reality" (Messer, 1996 as described in Butler, 1998, p. 21). From this perspective, a formulation is analogous to a broad socially constructed (i.e., a coconstruction of reality at a particular

time in place and culture) description of a person's experience, which should be viewed in terms of its practical utility rather than its "value-free accuracy" (Harper & Moss, 2003, p. 8).

Exploring the Potential Roles and Functions of Case Formulation

As multiple approaches to case formulation have been proposed, opinions vary regarding its specific roles and functions. To demonstrate the potential utility of case formulation within exercise psychology, it is worth considering some of the more prominent of these. From a traditional CBT perspective, Persons (1989) has described case formulation as the "therapist's compass" (p. 37), which acts as a steer to treatment. It has also been described as being analogous to a map that guides the therapeutic journey (Butler, 1998). As can be seen, case formulation recognizes that in many ways, the therapeutic or treatment process is akin to a journey. To demonstrate how case formulation can guide the treatment process, a number of more specific functions of formulation have been identified. The first of these is that it helps clinicians link a client's presenting problems to come to an understanding of the relationship between the difficulties (Persons, 1989; e.g., a problematic behavior may impact upon a second problematic behavior, yet without a linking case formulation, both difficulties could appear to be separate issues). Case formulation therefore acknowledges that clients often present with multiple related problems. Thus, within an exercise psychology context, it can account for the need to address both the individual's physiological symptoms (e.g., high blood pressure) and her or his related presenting cognitions (e.g., the belief that it is unsafe to exercise with high blood pressure or the belief that exercise will lead to a heart attack).

Persons (1989) also explained that case formulation assists with treatment decision making and the identification of an appropriate intervention strategy. For example, by exploring the psychological mechanisms that underpin an individual's overt difficulties (e.g., physical inactivity), it can encourage the identification of a suitably matched form of therapy or treatment. Case formulation can also help the therapist identify which difficulty to focus upon, because it should identify which cognitions (e.g., "I will look stupid if I exercise"), emotions (e.g., anxiety) and behaviors (e.g., avoidance) are most central to the client's problems (Butler, 1998). Therefore, in a PA behavior change context, case formulation can encourage a process of exploring the many potential reasons for a client's sedentary behavior to determine which of those to prioritize in treatment. Further, the case formulation process has also been shown to help the therapist understand a lack of progress or adherence to therapy (Butler, 1998; e.g., noncompliance to therapy may be linked to an underlying problem). It can therefore be used to understand drop out or noncompliance to PA intervention programs, and can encourage a process of reformulating and redirecting treatment in response to this. In addition, case formulation aids in the understanding of a current problem by relating it to a similar problem within the client's relationships, which can be of assistance in the exercise domain as well (e.g., lack of motivation to engage in PA may be linked to low self-esteem and anxiety in social situations).

The roles and functions specified previously imply that case formulation is of use to *both* the therapist and client and should impact positively upon treatment outcomes. Tarrier (2006) differentiated between clinical and subjective utility and argued that it is essential for a good formulation to have both. In terms of clinical utility, he argued that a case formulation should be “a precise account of the patient’s problems which is accurate, parsimonious, comprehensive, logical and functional” (p. 6). In terms of subjective utility, it should also “provide to the patient a meaningful account of their problem” (p. 6). Therefore, adopting case formulation to support and encourage successful PA behavior change should benefit both health/exercise professionals and patients by encouraging the development of a mutual comprehensive understanding of the patient’s difficulties (i.e., why they are struggling to engage in a more active lifestyle). This collaboratively developed understanding can then be used to guide both parties toward potential treatment options and treatment success.

Formulating a Case

To explain the components of case formulation, Kuyken, Padesky, and Dudley (2009) use the metaphor of a crucible. They explain that a crucible is a strong container for synthesizing different substances so that they are changed into something new and that typically heating the crucible facilitates the change process. They describe the case formulation process as being akin to this insofar as it “synthesizes a client’s presenting issues and experiences with theory and research to form a new understanding that is original and unique to the client” (Kuyken et al., 2009, p. 3). Therefore, case formulation seeks to derive meaning and understanding through the integration of empirical knowledge and the perspectives/experiences of the therapist and client. This process of developing a shared understanding, which is informed by relevant research and theory, has been referred to as “collaborative empiricism” (Beck et al., 1979, p. 6), as previously mentioned. The crucible analogy is also intended to convey that a formulation develops over time, like a chemical reaction. Consequently, case formulations usually start with a description of a client’s problems and then develop to account for an explanation of why the problem is occurring and what factors are maintaining it.

The Five Ps

To guide a formulation process that operates at the appropriate levels (i.e., both descriptive and explanatory) and fulfils the roles and functions mentioned previously, we refer to what is known as the Five Ps framework. The Five Ps have been described as an atheoretical model of case formulation in as much as it is not identified with any particular therapeutic style or psychological understanding of distress (Dudley & Kuyken, 2006). Consequently, it provides a suitable guide to demonstrate the potential utility of case formulation within a PA behavior change setting. The Five Ps framework is commonly used within CBT and describes five levels, which help structure the formulation process (Johnstone & Dallos, 2006). The five levels of the Five Ps framework are the following: *Presenting Issues* (a description of the clients presenting problems, in terms of emotions, cognitions, and

behaviors), *Predisposing Factors* (the factors that increase the person’s vulnerability to their current problems or led to the problems starting), *Precipitating Factors* (the factors that may have triggered the clients problems), *Perpetuating Factors* (the factors that maintain the problems), and *Protective Factors* (the positive assets and strengths the client demonstrates). See Table 1 for a complete description of the Five Ps and their potential application to physical activity behavior change promotion.

Table 1 The Five Ps of Formulation

The Five Ps	Potential Application to Physical Activity Behavior Change Promotion
1. Presenting issues Statement of the client’s presenting problems in terms of emotions, cognitions, and behaviors.	This goes beyond diagnosis in that it attempts to define the current problems a person faces. Consequently, it does not involve categorizing them according to preexisting criteria but introduces specificity and individualization.
2. Predisposing factors The distal external and internal factors that increase the person’s vulnerability to their current problems (i.e., what led to the problems starting?).	Encourages the development of a longitudinal understanding of a person’s problems. This is intended to encourage the identification of more in-depth interventions that aim to maintain change and prevent relapse (i.e., promote long-term behavioral modification).
3. Precipitating factors The proximal external and internal factors that triggered the current presenting issues.	Encourages the identification and exploration of the activating events and associated beliefs linked to a person’s presenting issues.
4. Perpetuating factors The internal and external factors that maintain the current problems.	Helps provide a focus for the intervention by identifying the factors that need to be addressed to break the maintenance (of sedentary behaviors) cycle.
5. Protective factors The person’s resilience and strengths that help maintain emotional health.	Provides a path of least resistance by identifying strategies that build on existing resilience and strengths.

Note. Adapted from Johnstone & Dallos, 2006.

Typically, the case formulation process takes place during a routine collaborative consultation. Within a PA behavior change context, this could be a consultation with a primary healthcare worker (e.g., nurse, PARS worker, family physician, exercise psychologist). During this time, the health professional and client work together to identify and explore the five areas identified in Table 1. This process should assist with the collective identification of an individualized treatment plan, which seeks to address the underlying mechanisms responsible for that person’s presenting problems.

To demonstrate the potential utility of the Five Ps case formulation process within a PA behavior change context, a hypothetical case study is referred to based on one of the author's experiences of carrying out research with PARS clients. Specifically, the case depicted below is representative of a typical PARS client and was informed by a research study that examined PARS clients' experiences of PA behavior change (Hutchison, Johnston, & Breckon, 2009).

Mr. B.: A 61-year-old married man who recently had to take early retirement from his stressful job on account of his deteriorating physical and mental health. After suffering and recovering from a heart attack, his doctor advised that he was no longer able to meet the demands of his work. The doctor explained that the heart attack was a direct result of his high cholesterol levels, which can be attributed to lifestyle factors such as a poor diet, a lack of PA, a history of smoking, and alcohol dependence. Since taking early retirement, Mr. B. has been prone to bouts of depression. To reduce the chances of subsequent heart problems and improve his mental health, alongside drug treatment, Mr. B. was prescribed a 12-week (PARS) program of supervised PA at his local leisure centre.

Based on the above case, Table 2 provides an overview of how an initial case formulation may look for Mr. B. Included in Table 2 is an additional column, which identifies how an initial treatment plan could look as a result of the case formulation process.

Table 2 demonstrates how the initial formulation process reveals a more detailed account of Mr. B.'s PA participation-related presenting problems and the factors contributing to their development and maintenance. While the medical doctor's diagnosis (relating to Mr. B.'s deteriorating physical and mental health) is highlighted in Table 2, the case formulation process goes well beyond this by identifying emotional, cognitive, and behavioral dimensions of those problems, in addition to providing further insight into their underlying causes. Crucially, the formulation process has identified the additional issue of Mr. B.'s anxiety about engaging in PA (the treatment prescribed by his medical doctor). Consequently, based on the formulation process, it would be reasonable to predict that Mr. B. may struggle to engage in a prescribed program of physical activity (e.g., PARS) without additional support. Therefore, if PA engagement is accepted as an appropriate way to improve Mr. B.'s physical and mental health, it is then of primary importance to address his motivation to engage in PA.

Table 2 also demonstrates the complex, multidimensional nature of Mr. B.'s current health problems and his attitudes toward PA. Specifically, it is revealed how his presenting issues may be traced back to a range of previous experiences, occurrences, social interactions, etc. By acknowledging these predisposing, precipitating, and perpetuating factors, the case formulation helps to identify what underlying issues may need to be addressed to encourage Mr. B.'s engagement in PA and help to predict how this can potentially be achieved. As explained previously, the case formulation process also benefits from the inclusion of relevant research and theory, which informs a better understanding of the issues being raised and reveals potential solutions/courses of action. This process of "collaborative empiricism" (Beck et al., 1979) encourages the identification of an appropriate plan of action that is both theoretically grounded and specific to the individual in question. Consequently, to

demonstrate the relevance of gathering all of the information presented in Table 2, an initial³ plan of action is highlighted based on the information gathered. Ultimately, the example of Mr. B. (as described in the case of Mr. B and expanded upon in Table 2) is used to demonstrate that the case formulation process can provide a vehicle for facilitating a more comprehensive approach to the design and implementation of PA behavior change interventions.

Practical Implications

Despite the potential benefits of a case formulation approach, it is a tool intended to be used by licensed/certified psychologists equipped to deal with a range of psychological issues. Persons (1989) has explained that one role of case formulation is to help clinicians link a client's presenting problems to come to an understanding of the relationships between the difficulties. Therefore, it acknowledges that an individual's presenting problems may be linked to other underlying psychological concerns. This is potentially problematic if it is considered a tool for exercise psychologists because it raises the possibility of uncovering clinical issues, which an exercise professional may not be equipped to recognize or allowed to deal with. With exceptions, many exercise psychologists are not trained to treat psychopathological issues, and health professionals working in health and leisure facilities (e.g., gyms) tend to possess an exercise physiology expertise. Nevertheless, the reality is that exercise professionals *are* increasingly being exposed to complex psychopathology in the form of addiction, disordered eating, self-harm, depression, anxiety disorders, trauma, and personality disorders, to name but a few. Although these issues are outside of many exercise professionals' areas of professional competency or licensure, these professionals are often not routinely trained at the undergraduate or postgraduate level in how to even recognize such cases to refer a client to the appropriate professional. As one of the current authors (with doctoral training in both clinical and exercise psychology) receives regular requests for training in clinical issues for individuals working within exercise psychology, and advice regarding suitable referral pathways, there is clearly a need to include a greater focus on these issues (as allowable) within the training of exercise psychologists and PARS workers.

Case formulation is also viewed as an evolving device, which provides an ongoing reference point for practitioners and clients throughout the therapeutic process (Grant, Mills, Mulhern, & Short, 2004). This highlights the comparatively intensive nature of cognitive and behavioral therapies, which comprise multiple consultations lasting for approximately one hour at a time. Therefore, for such techniques to be implemented successfully in PA behavior change settings, it would possibly result in a more labor-intensive intervention process. Consequently, although this paper seeks to encourage a move toward more intensive ways of facilitating PA behavioral changes, in practice, this may potentially be difficult to achieve without some structural reforms. Specifically, it may be necessary for health services or authorities to consider the need for additional, clinically trained roles within their PA promotional structures. This may include the provision of training (or continuing personal and professional development; CPD) activities for existing PARS workers in basic and allowable skills more commonly adopted in clinical psychology settings.

Table 2 Example Case Formulation for Mr. B

1. Presenting Issues				
• Emotional impact of poor quality of life due to deteriorating physical (heart condition) and mental (depression) health [EMOTIONS] • Reluctance to engage in any physical activity due to underlying health beliefs [THOUGHTS] • Inactivity and poor diet [BEHAVIORS]				
2. Predisposing	3. Precipitating	4. Perpetuating	5. Protective	
• Smoking: Started at the age of 14, both parents were heavy smokers, received no education about the dangers of smoking until later life. • Poor diet: Wife is purchaser of food and prepares all his meals. She likes home baking (cakes etc.), fried foods and she is also clinically obese. • Habitual alcohol dependence: This includes both Mr. B. and his wife. They often drink alcohol as a way of coping with life's stressors. This started approximately 27 years ago (when one of their children died unexpectedly).	• Heart attack (2010). • Diagnosed with obesity and hypertension in 2009. • Regularly experiences breathlessness when carrying out everyday tasks (e.g., walking up stairs).	• Enjoys watching film and television—has found it helps him to relax. • Uses car to travel small distances, as it saves time. • His wife believes that PA will trigger further heart attack.	• Strong social support network at his golf club (describes himself as a social golfer). • Is in a stable relationship—married to wife for 30 years. • Has recently stopped smoking. So, he has learned to change a negative health behavior before.	

- In recent years, his work as a teacher became increasingly stressful as new technologies were introduced. He had difficulty adapting to these changes (avoidance of new technology).
- Because of the above, he is anxious about engaging in any PA.
- During a previous PA program (cardiac rehab), an instructor was always present. So, he has become dependent on having an instructor present.
- He believes that exercise triggered the heart attack.

Plan

- CBT work with Mr. B. and his wife to challenge the belief that “exercise is dangerous” [IAPT worker—see Working with Current Mental Health Initiatives section]
- Psycho-educational work regarding diet [Dietician]
- Motivational interviewing based intervention to build motivation and self efficacy for exercise with Mr. and Mrs. B.
- Discuss dependence issue with exercise instructor who will look to design and implement a program that encourages progressive independence.

Working With Current Mental Health Initiatives

Although current practices in exercise psychology and the infrastructures within which they operate may not be perfectly conducive to supporting the type of intervention reforms highlighted herein, better links between more mainstream psychological services and PA promoting bodies may help address some of these issues. For example, within UK mainstream psychology in particular, a recent move can be observed toward making psychological treatment and support services increasingly available to a wider population. In response to a report published by the UK Centre for Economic Performances Mental Health Policy Group (2006), which identified the need for additional available psychological services, the Improving Access to Psychological Therapies program (IAPT) was initiated.

The IAPT program was set up to provide increased access to psychological treatment for people suffering from depression and anxiety disorders (Care Services Improvement Partnership; CSIP, 2008). It aims to provide a service which involves a primary care referral system whereby patients can be referred to a team of therapists who are equipped to deliver differing intensities of intervention based on an assessment of an individual's presenting problems (CSIP). It is also intended to be an integrative service, whereby links are available to other support services/sources of information (e.g., employment or housing services). Consequently, the IAPT initiative may provide a potential infrastructure within which those seeking to change PA or health related behaviors can receive an appropriate level of support. For example, while IAPT is currently aimed at depression and anxiety disorders, in the future it could also target health related behavior modification such as PA behavior change. This would allow a primary care health professional to refer a client (who needs to increase PA habits) to a therapist who would be able to conduct an in-depth assessment (and case formulation) of the patient, and to determine the origins, development, and maintenance of the sedentary behavior. Depending on the outcome of this process, the integrative nature of IAPT would then allow for an appropriate treatment plan to be devised. This may involve continued CBT-related procedures (of an appropriate type and level of intensity for that individual) and/or a referral to an exercise facility (e.g., gym) for instructional and informational expertise. Therefore, mainstream psychological services and programs such as IAPT may provide a vehicle for more individualistic PA interventions, and the implementation of case formulation as a therapeutic tool.

Conclusion

This article has explored the utility of case formulation as a therapeutic tool for use within a physical activity (PA) behavior change context. Case formulation encourages the development of a case-specific explanation of a client's problems, which can be used to guide a continually evolving treatment (or PA behavior change promoting) process. Specifically, it encourages a more comprehensive biopsychosocial approach to understanding health related behaviors, such as PA, to facilitate more individualistic intervention practices. To bridge the gap between theory and practice, case formulation also provides a process by which exercise professionals can achieve greater synthesis between an individual case and relevant theory and

research. Finally, this paper reasserts the importance of embedding some of the valuable principles within clinical psychology into health promotion and exercise psychology settings.

End Notes

¹ To promote and maintain health, the ACSM recommend that all healthy adults aged 18–65 need moderate-intensity aerobic (endurance) physical activity for a minimum of 30 min, 5 days per week, or vigorous-intensity aerobic physical activity for a minimum of 20 min, 3 days per week (Haskell et al., 2007).

² The term case formulation refers to its use with an individual, couple, or group as it is by Kuyken (2006).

³ The word ‘initial’ is used here to convey that formulation is viewed as a *process* which should be continually revisited to reformulate a client’s difficulties as new information is discovered (Dudley & Kuyken, 2006).

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