



## Exercise imagery and its correlates in older adults

Cecilie Thøgersen-Ntoumani<sup>a,\*</sup>, Jennifer Cumming<sup>a</sup>, Nikos Ntoumanis<sup>a</sup>, Nikitas Nikitaras<sup>b</sup>

<sup>a</sup> University of Birmingham, UK

<sup>b</sup> University of Athens, Greece

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### ABSTRACT

**Objectives:** The purpose of the present study was to test a structural model examining the interrelationships between exercise imagery, self-reported exercise behaviour and well-being in older adults.

**Design:** Cross-sectional survey.

**Method:** Participants were 499 older Greek adults (50.10% males) aged between 51 and 84 years ( $M$  age = 57.31;  $SD$  = 5.52) who completed questionnaires measuring exercise imagery use, exercise behaviour, subjective vitality, and physical self-worth. The relationship between these variables was tested with a structural model based on the applied model of imagery use for exercise (Munroe-Chandler & Gammage, 2005).

**Results:** Energy imagery positively predicted exercise behaviour and subjective vitality, and appearance and technique imagery positively predicted physical self-worth.

**Conclusions:** These results indicate older adults engage in different types of imagery to motivate themselves to exercise and improve their well-being, thus implying that the content of imagery interventions should be specifically tailored to the outcomes older adults wish to realise for interventions to be effective.

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Physical activity plays an important role in successful ageing through the prevention of chronic disease and the promotion of functional capabilities, health, and well-being (Baker, Meisner, Logan, Kungl, & Weir, 2009; Rowe & Kahn, 1987). These benefits include reduced risk for cardiovascular disease (Hamer & Chida, 2008), type 2 diabetes mellitus (Orozco et al., 2008), falling (Gillespie et al., 2003), dementia (Larson et al., 2006), and premature death (Byberg et al., 2009; Sui et al., 2007). The accumulative evidence also indicates that being active in later life lowers the cognitive and metabolic functional declines that normally accompany ageing (DiPietro, Dziura, Yeckel, & Neuffer, 2006; Keysor, 2003), and enhances mental health and quality of life (Penedo & Dahn, 2005; Rejeski & Mihalko, 2001).

Despite the physical and psychological importance of being active when older, sedentary behaviour is a major public health concern for adults aged 50 years and over (Prohaska et al., 2006). This age group represents the fastest growing segment of the population and consists of those at greatest risk of chronic disease, disability and health care utilisation (King, Rejeski, & Buchner,

1998). Many older adults are not participating in sufficient exercise, with only 45.4% of Greek males and 38.2% of Greek females aged 60 years and older being regularly physically active (Pitsavos, Panagiotakos, Lentzas, & Stefanadis, 2005). Similarly, the vast proportion of older adults across a range of European countries are insufficiently physically active to accrue substantial health benefits (Besson et al., 2009). These findings underscore the need to more effectively promote physically active living in this age group and the value of interventions targeting physical activity increases and the maintenance of these behaviours.

Surprisingly, however, research rarely investigates how older adults self-regulate their exercise behaviour, motivation, and well-being. This is of particular importance since most interventions result in only modest changes in physical activity levels (Eakin, Glasgow, & Riley, 2000) and many older individuals fail to maintain newly adopted exercise patterns (Ecclestone, Myers, & Paterson, 1998). Moreover, older adults have identified internal barriers including a lack of motivation as a constraint to their exercise participation (Lees, Clark, Nigg, & Newman, 2005). Self-regulation, the personal regulation of goal-directed behaviour or performance (Bandura, 1997), is an important contributor to being physically active (Umstattd, Wilcox, Saunders, Watkins, & Dowda, 2008). Personal strategies (e.g., goal-setting, planning, self-monitoring and time management) are often incorporated into interventions, but these forms of self-regulation are rarely measured or evaluated

\* Corresponding author. School of Sport and Exercise Sciences, College of Life and Environmental Sciences, University of Birmingham, Edgbaston, Birmingham B15 2TT, UK. Tel.: +44 0 121 4145816; fax: +44 0 121 414 4121.

E-mail address: [C.Thogersen@bham.ac.uk](mailto:C.Thogersen@bham.ac.uk) (C. Thøgersen-Ntoumani).

(e.g., Brawley, Rejeski, & Lutes, 2000; Juneau et al., 1987; Sharpe et al., 1997). The resulting lack of information makes it difficult for organisers of health-promotion programs to identify what are the effective ways of developing self-regulatory processes and, in turn, maximise the likelihood of intervention success (Ayotte, Margrett, & Hicks-Patrick, 2010).

Imagery is an internal experience that occurs in different sensory modalities and mimics real experience (White & Hardy, 1998). In his seminal paper, Hall (1995) proposed: 1) individuals experience a diverse range of exercise images; 2) exercise images can be classed as serving cognitive or motivational functions; and 3) exercise behaviour would be influenced by experiencing these images, both directly and indirectly by raising expectations of positive outcomes (e.g., health benefits, weight management). Qualitative and quantitative research has supported these predictions and substantiated imagery as a self-regulatory strategy for increasing and/or maintaining exercise behaviour (Gammage, Hall, & Rodgers, 2000; Giacobbi, Hausenblas, Fallon, & Hall, 2003; Hausenblas, Hall, Rodgers, & Munroe, 1999; Kim & Giacobbi, 2009; Short, Hall, Engel, & Nigg, 2004).

A central finding of this research has been that exercisers use three main types of imagery: appearance (motivational function), energy (motivational function), and technique (cognitive function) (Gammage et al., 2000; Hausenblas et al., 1999; Kim & Giacobbi, 2009). Appearance imagery involves imaging improvements to one's physical appearance. Energy imagery includes imagery of exercising to distract/motivate as well as feel energised. Finally, technique imagery refers to images of learning and performing exercises correctly. The content and functions of exercisers' imagery forms the core of Munroe-Chandler and Gammage's (2005) *applied model of imagery use for exercise*, which hypothesises that each type of imagery will impact specific affective, cognitive and behavioural outcomes. Appearance imagery has been positively associated with intention to exercise (Rodgers, Munroe, & Hall, 2001). By comparison, energy imagery has been positively associated with exercise-induced feeling states of revitalisation, tranquillity, and positive engagement (Cumming & Stanley, 2009). Further, Cumming (2008) found that technique imagery positively predicted perceptions of task efficacy (e.g., confidence in one's abilities to perform elemental aspects of an exercise task, including pacing oneself and avoiding overexertion; Rodgers & Sullivan, 2001).

Together these results provide support for the applied model of imagery use for exercise and imply different types of imagery can be used to regulate exercise thoughts, feelings, and behaviours (Cumming & Stanley, 2009). Noteworthy is that the majority of this research has employed samples of mostly young exercisers (Gammage et al., 2000; Giacobbi, Hausenblas, & Penfield, 2005; Hausenblas et al., 1999). Only a few studies have focused on older adults, but the existing research does suggest exercisers continue to use, and benefit from, the same three types of imagery later in life (Kim & Giacobbi, 2009; Milne, Burke, Hall, Nederhof, & Gammage, 2005; Wesch, Milne, Burke, & Hall, 2006). The present study builds on this burgeoning work by investigating different correlates of exercise imagery use in older adult exercisers. Of particular interest was to examine the relationships between exercise imagery, self-reported exercise behaviour (expressed as metabolic equivalents or METS), and two forms of well-being: physical self-worth and subjective vitality.

Imagery use is proposed to be a determinant of exercise behaviour (Hall, 1995; Munroe-Chandler & Gammage, 2005). All three types of exercise imagery play a role in the self-regulation in exercise behaviour for younger adults (Gammage et al., 2000; Giacobbi et al., 2005; Hausenblas et al., 1999), but imagining oneself being fitter or leaner (i.e., appearance imagery) has

emerged as the best predictor (Cumming, 2008). Not yet clear is whether this same pattern will be found in older adults. Appearance is a key motive to exercise, also in later life, but older adults reportedly engage in less appearance imagery than younger counterparts (Milne et al., 2005; Pliner, Chaiken, & Flett, 1990; Smith & Störandt, 1997). Imagining feelings of being energised and psyched up (i.e., energy imagery) has instead emerged as more important to older adults' exercise behaviour (Wesch et al., 2006).

Older adults may also benefit from using imagery by experiencing changes in subjective vitality, a form of eudaimonic well-being that involves feeling alive, invigorated and possessing enthusiasm and energy (Ryan & Frederick, 1997). The energy available to oneself is an indicator of greater health and physical functioning (Hubley & Russell, 2009; Ryan & Deci, 2008), and may also serve as a protective factor against cardiovascular disease (Smart Richman, Kubzansky, Maselko, Ackerson, & Bauer, 2009). Physical activity is a source of energy and more active older adults report greater subjective vitality than inactive older people (Kerse, Elley, Robinson, & Arroll, 2005; Stewart et al., 2003). Younger and older adults also use imagery to feel energised and alter their feeling states (Cumming & Stanley, 2009; Kim & Giacobbi, 2009). Thus, a greater use of energy imagery may contribute to reports of subjective vitality, both directly and indirectly via changes in exercise behaviour.

Older adults also experience concerns of "trying not to look old" and report a strong desire to preserve or improve their appearance (Hardy & Grogan, 2009). This aspiration is likely reflected by appearance imagery being the most frequently reported imagery type used by older adults (Milne et al., 2005). A negative body image can adversely affect a person's sense of well-being and quality of life as well as deter them from engaging in physical activity (McLaren, Hardy, & Kuh, 2003). Exercising, however, can also enhance physical self-worth in older adults by enabling them to feel more competent to carry out their activities and feel better about their appearance (Dionigi & Cannon, 2009; Mutrie & Davison, 1994). Given that these changes match the content of appearance and technique imagery, it is possible that using both types of imagery might improve the valued judgments individuals make about their body, including its abilities and looks (Dionigi & Cannon, 2009).

Guided by the applied model of imagery use for exercise, the purpose of this study was to test a structural model examining the relationships between exercise imagery, self-reported exercise behaviour and well-being (subjective vitality and physical self-worth). Based on the extant literature, we hypothesised a direct relationship between the exercise imagery types (energy, technique, and appearance) and self-reported exercise behaviour. A direct relationship, as well as an indirect relationship via exercise behaviour, was also predicted between energy imagery and subjective vitality, technique imagery and physical self-worth, and appearance imagery and physical self-worth.

## Method

### Participants

Participants were 499 community-dwelling Greek adults (50.10% males) aged between 51 and 84 years ( $M$  age = 57.31;  $SD$  = 5.52). All participants reported engaging in at least 30 min of moderate intensity (physical activity that make people slightly out of breath) or strenuous exercise on a weekly basis. Most of the participants were married (70.90%). Based on self-reported height and weight measures, Body Mass Index (BMI) was estimated at 26.15 ( $SD$  = 3.63).

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